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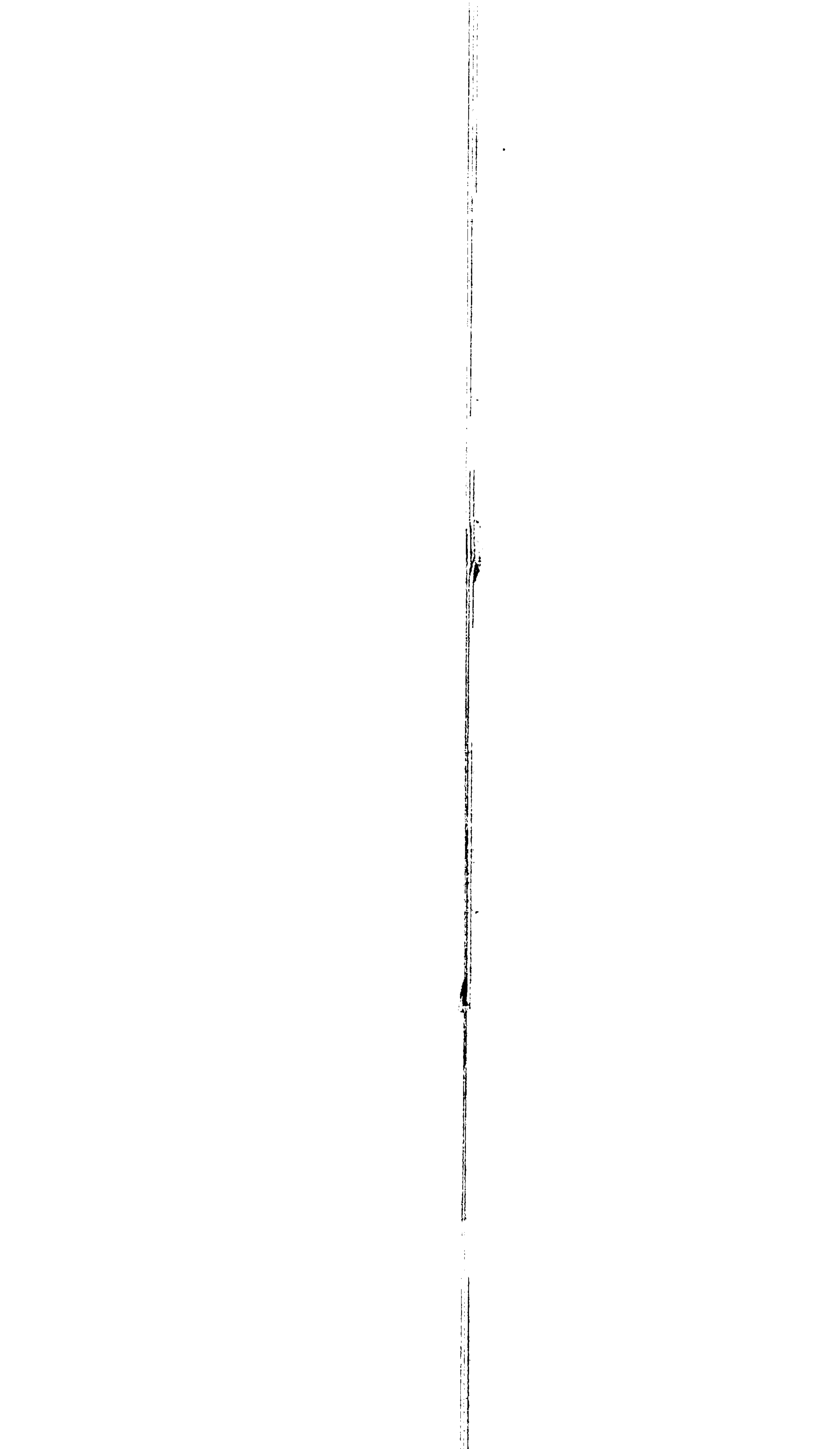
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THE
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ART. I.—*The Benedictine Centuries.*

WE read in history of great commanders, who, when an overwhelming force was directed against them on the plain, and success was for the time impossible, submitted to necessity, and, with plans afterwards to be developed, retired up the mountain passes in their rear, where nature had provided a safe halting place for brave men who could not advance, and would not turn in flight. There, behind the lofty crag, the difficult morass, and the thick wood, they nursed their confidence of victory, and waited patiently for an issue, which was not less certain because it was delayed. On came the haughty foe with cries of defiance; and, when at length he thought he had them at his mercy, he found that first he must do battle with the adamantine rocks, which sternly rose up in defence of fugitives who had invoked their aid. Then he stood for a while irresolute, till the difficulties of his position ended his deliberation and forced upon him a retreat in his turn, while the lately besieged hosts were once more in motion, and pressed upon the baffled foe, who had neither plan of campaign, nor base of operations to fall back upon.

As armies retire, and then advance,

Such is the history of Christian civilization. It gave way before the barbarians of the north and the fanatics of the south; it fled into the wilderness with its own books and those of the old social system which it was succeeding. It obeyed the direction given it in the beginning,—when persecuted in one place, to flee away to another; but

so did the Church militant.

at length the hour of retribution came, and it advanced into the territories from which it had retired. St. Benedict is the historical emblem of its retreat, and St. Dominic of its return.

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We do not say that its retreat in the first centuries was in order to its return in the medieval. There was no oracular voice which proclaimed what would be the course of the war; no secret tradition which whispered to the initiated the tactic that ought to be pursued. It is a sufficient explanation of the double movement, that they who feel their weakness are used to give way, and they who feel their strength are used to push forward. The corruptions of Roman society caused Christians to despair of ever mending it, and to look out for that better world which was destined to supersede it. The evil which they experienced, the good for which they sighed, the promise in which they confided, wrought in them the persuasion that the end of all things was at hand; and this persuasion made them patient under inconveniences which were only temporary. "Behold, my brethren", says Pope Gregory about the year 600, "we already see with our eyes, what we are used to hear in prophecy. Day by day is the world assaulted by fresh and thickening blows. Out of that innumerable Roman *plebs* what a remnant are ye at this day! yet incessant scourges are still in action; sudden adversities thwart you; new and unforeseen slaughters wear you away. For, as in youth the body is in vigour, the chest is strong, the neck muscular, and the arms plump, but in old age the stature is bent, the neck is withered and stooping, the chest pants, the energies are feeble, and breath is wanting for the words; so the world too once was vigorous, robust for the increase of its kind, green in its health, and opulent in its resources, but now on the contrary it is laden with the weight of years, and is fast sinking into the grave by its ever-multiplying maladies. Beware then of giving your heart to that, which, as even your senses tell you, cannot last for ever".¹ Commonly the presentiment wore a more definitely supernatural expression than is found in this extract. Not sense merely, but the prophecies were invoked, which spoke of that great enemy of the Church, who was to be the herald of the second advent; and the rudiments of a new order of things were descried in the manifest tokens of an expiring world.

¹ Hom. i. 1.

In all times indeed the multitude, whether from religious feeling or from superstition, is prone to portend some impending catastrophe from the occurrence of any startling phenomenon of nature. An eclipse, a comet, a volcanic eruption, is to them the omen of coming evil. But in the early centuries of the Church, the expectation extended to the learned and the saintly. It was the posture of mind of confessors and doctors. As St. Gregory looked out for Antichrist in the sixth century, so did the Martyrs of Lyons in the second, St. Cyprian in the third, St. Hilary and St. Chrysostom in the fourth, and St. Jerome in the fifth. It was the sober judgment of the wisest and most charitable, that the world was too bad to mend, and that destruction was close upon it.

What would be the practical result of such a belief? That which we have partly described in an article, of which the present is a continuation;² evidently, to leave the world to itself. Evils which threaten to continue, we try to remedy; but what was the use of spending one's strength in reforming a state of things, which would go to pieces, if let alone, and, if ever so much meddled with, would go to pieces too, nay, the sooner perhaps, for the meddling? It was then the prevalent disposition, as we have said, of Christians of the first centuries, and no irrational disposition, either to leave the world, or to put up with it, not to set about influencing it. "Let us go hence", said the angels in the doomed sanctuary of the chosen people. "Come ye out of her, my people", was the present bidding of inspiration. Those who would be perfect, obeyed it, and became monks. Monachism therefore was a sort of recognized emigration from the old world. St. Antony had found out a new coast, the true *eldorado* or gold country; and on the news of it thousands took their departure year after year for the diggings in the desert. The monks of Egypt alone soon became an innumerable host. As times got worse, Basil in the East, and Benedict in the West, put themselves at the head of fresh colonies, bound for the land of perpetual peace. There they sat them down, over against Babylon, and waited for the coming judgment and the end of all things. Those who remained in the world, waited too. To un-

² We may here set right our translation of the word "siligo" in that article. It is rye, as well as wheat, and has that meaning in the passage quoted, p. 29.

dergo patiently what was, to make the best of it, to use it, as far as it could be used, for religious purposes, was their wisdom and their resolve. If they took another course, they would be wasting strength and hope upon a shadow, and losing the present for a future which would never come. They had no large designs or profound policy. It was their aim that things should just last their time. They patched them up as best they might; they made shift, and lived from hand to mouth; and they followed events, rather than created them. Nor, when they undertook great labours, and began works pregnant with consequences, did they perceive whither they were going.

How different in this respect is the spirit of the first Gregory, already cited, from that of Hildebrand the Seventh! Gregory the First did not understand his own act, when he converted the Anglo-Saxons; nor Ambrose, when he put Theodosius to penance. The great Christian Fathers laid anew the foundations of the world, while they thought that its walls were tottering to the fall, and that they already saw the fires of judgment through the chinks. They refuted Arianism, which they named the forerunner of the last woe, with reasonings which were to live for ages; and they denounced the preachers of a carnal millennium, without anticipating that glorious temporal reign of the saints which was to be fulfilled in medieval times. They propounded broad principles, but did not carry them out into their inevitable consequences. How slow were they to define doctrine, when disputes arose about its meaning or its bearing! How little jealous were they of imperial encroachments on ecclesiastical rights, when they are viewed by the side of the great Popes who came after them! How tamely do they conduct themselves, when the civil magistrate interferes with their jurisdiction, or takes the initiative in points of discipline or order, in questions of property, and matrimonial causes! How contented or resigned are they to avail themselves of such education as the state provided for their use; sending their children to the pagan schools, before they have teachers of their own, and, even when at length they have them, adopting the *curriculum* of studies which those pagan schools had devised!

In fact, "the wish was father to the thought". Religious minds will always desire, will always be prone to believe, the approach of that happier order of things, which sooner or later is to be. This hope was the form

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in which the deep devotion of those primitive times other les- showed itself; and if it did not continue in its full ex-son. pression beyond them, this was because experience had thrown a new light upon the course of Divine Providence. With the multitude, indeed, as we have said, who know little of history, and in whom religious fear is a chief element, the anticipation of the last day revived, and revives, from time to time. At the end of the tenth century, when a thousand years had passed over the Church, the sense of impending destruction was so vivid as even to affect the transfer and disposal of property, and the repair of sacred buildings. However, when we seek in theologians for the apprehension, we shall find that it is a characteristic of the old Empire far more than of the barbarian kingdoms which succeeded to it. The barbarian world was young, as the Roman world was effete. Youth is the season of hope; and, according as things looked more cheerful, so did they look more lasting, and to-day's sunshine became the sufficient promise of a long summer. A fervent preacher here or there, St. Norbert or St. Vincent Ferrer, may have had forebodings of the end of all things; or an astrologer or a schismatizing teacher may have traded on the belief; but the men of gravity and learning after the time of Gregory, for the most part, set their faces against speculations about the future.

Bede, after speaking of the six ages of the world, says, that "as no one of the former ages has consisted exactly of a thousand years, it follows that the sixth too, under which we live, is of uncertain length, known to him alone, who has bidden his servants watch. For", he continues, "whereas all saints naturally love the hour of his advent, and desire it to be near, still, we run into danger, if we presume to conclude or to proclaim, either that the hour is near or that it is far off".³ Raban and Adson, who witnessed or heard of the splendours of Charlemagne, go so far as to indulge the vision of a great king of the Franks, who, in time to come, is to reign religiously, ere the fulfilment of the bad times of the end.⁴ Theodulf indeed predicts that they were coming; but, even when the popular excitement was at its height, in the last years of the tenth century, Richard and Abbo of Fleury, and

³ De Rat. Temp. 66, 67. Elsewhere, he speaks of *futura tempora sub Antichristo*, in Sam. iv., 2, p. 300.

⁴ Raban, de Antichr. opp. t. 6, p. 178. Adson, ap. Alcuin, t 2, p. 529.

the Adson above mentioned, set themselves against it. Hardly was the dreaded crisis over, when men took heart, and began to restore and decorate the Churches; hardly had the new century run its course, when Pope Paschal the Second held a Council at Florence against the archbishop of that city, who had preached of the coming end.⁵ Such was the change of sentiment which followed after the Pontificate of St. Gregory, the last and saddest of a line of Fathers, who thought the world was on the verge of dissolution.

and monks took part in the world,
 The names which we have been introducing, show that, among these converts from a despairing view of things, were Benedictine monks, members of those very associations which had given up the world as lost, and had quitted it accordingly. And their position in their own body is sufficient evidence that what they held, their brethren held too; and that the actual changes in the social fabric had been followed by a change of sentiment also in these religious bodies. When we look into history, to see what these authors were, as well as who, we find the fact plain beyond all denial; for the monk Alcuin was Charlemagne's instructor, and head of the school of the palace; the monk Theodulf was a political *employé* of the same Emperor, and bishop of Orleans; and the monk Raban was archbishop of Mayence. How could the cloister-loving monk have come to such places of station, without some singular change in his sentiments? And these instances, it must be allowed, are only samples of a phenomenon, which is not uncommon in these centuries. Here then we have something to explain. Why should Benedictines leave those sweet country-homes which St. Benedict bequeathed to them, for the haunts of men, the seats of learning, archiepiscopal sees, and king's courts? St. Jerome had said, when Monachism was young: "If the priest's office be your choice, if a bishop's work or dignity be your attraction, live a town life, and save your soul in saving others. But, if you wish to be a monk, that is a solitary, in fact as well as in name, what have you to do with towns?" "A monk's office", he says elsewhere, "is not a teacher's but a mourner's, who bewails either himself or the world".⁶ This, doubtless, was

in spite of their vocation

⁵ So Malvenda, t. i. p. 118, calling the prelate "Fluentinus", which sounds like a name of place. Ughelli is silent, Baronius almost so.

⁶ Ad Paulin. Ep. 58; adv. Vigil. fin.

the primary aim and badge of the religious institute; and if, among uncongenial offices, there be one more uncongenial to it than another, it was that of a ruler or a master. The monk did not lecture, teach, controvert, lay down the law, or give the word of command; and for this simple reason, because he did not speak at all, because he was bound to silence. He had given up the use of his tongue, and could neither be preacher nor disputant. It follows, we repeat, that a singular change must have taken place by the ninth century, in the ecclesiastical position of a monk, when we find instances of his acting so differently from St. Jerome's teaching and example in the fifth.

We touched, in our former article, upon this seeming anomaly in the history of the Benedictines, while we were describing them in outline; if we did not then dwell upon it and investigate its limits, this was because we thought it advisable first to trace out the general idea of the monastic state, with as little interruption as was possible, without risking the confusion which would arise in our delineation from a premature introduction of the historical modifications to which that idea has actually been subjected. Now, however, the time has come for taking up what in that former sketch we passed over; and we propose in this article accordingly, after a brief reference to the circumstances under which these modifications appeared, and to the extent to which they spread, to direct attention to the principal instance of them, viz., the literary employments of the monks, and to show how singularly, after all, these employments, as carried out, were in keeping with the main idea of the monastic rule, even though they seem at first sight scarcely contained in its letter. We stated, when we originally opened our subject, that the substance of the monastic life was "summa quies"; that its object was rest, its state retirement, and its occupations such as were unexciting, and had their end in themselves. That the literature in question was consistent with these conditions will be clearly seen, when we come to describe it; first, however, let us allude to the circumstances which called for it, and the hold which it had upon the general body.

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It is rare, indeed, to find the profession and the history of any institution running exactly in one and the same groove. The political revolutions which issued in the rule of Charlemagne, changing, as they did, the currents of

Duties
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the world, and the pilotage of St. Peter's bark, became a severe trial of the consistency of an Order, like the Benedictine, of which the maxims and the aims are grave, definite, and fixed. Demands of action and work would be made on it by the exigencies of the times, at variance with its genius, and it would find itself in the dilemma of failing in efficiency on the one hand, or in faithfulness to its engagements on the other. It would be incurring either the impatience of society, which it disappointed, or the remonstrances of its own subjects, whom it might be considered to betray.

which,
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surprise.

And indeed a greater shock can hardly be fancied, than that which would overtake the peaceful inhabitant of the cloister, on his finding that, after all, he so intimately depended still upon the world, which he had renounced, and that the changes, which were taking place in its condition, were affecting his own. Such men, whether senators like Paulinus, or courtiers like Arsenius, or legionaries like Martin, had one and all in their respective places and times left the responsibilities of earth for the anticipations of heaven.⁷ They had sought, in the lonely wood or the silent mountain top, the fair uncorrupted form of nature, which spoke only of the Creator. They had retired into deserts, where they could have no enemies but such as fast and prayer could subdue. They had gone where the face of man was not, except as seen in pale, ascetic apparitions like themselves. They had secured some refuge, whence they might look round at the sick world in the distance, and see it die. But, when that last hour came, it did but frustrate all their hopes, and, for an old world at a distance, they found they had a young world close to them. The old order of things died indeed, but a new order took its place, and they themselves, by no will or expectation of their own, were in no small measure its very life. The lonely Benedictine rose from his knees, and found himself a city. This was the case, not merely here or there, but everywhere; Europe was new mapped, and the monks were the principle of mapping. They had grown into large communities, into abbeys, into corporations with civil privileges, into landholders with tenants, serfs, and baronial neighbours; they had become centres of population, the schools of the most cherished truths,

⁷ "Omnibus idem propositus scopus erat, idemque finis, nempe secessus à sæculi tumultu et corruptelis". Mabillon *Annal*, t. i., p. 215.

the shrines of the most sacred confidences. They found themselves priests, rulers, legislators, feudal lords, royal counsellors, missionary preachers, controversialists; and they comprehended that, unless they fled anew from the face of man, as St. Antony in the beginning, they must bid farewell to the hope of leading St. Antony's life.

In this choice of difficulties, when there was a duty to stay and a duty to take flight, the monastic bodies were not unwilling to come to a compromise with the age, and, reserving their fidelity to St. Benedict, to undertake those functions to which both the world and the Church called them. Such, that is, for the most part, was the resolve of those who found themselves in this perplexity; but it could not be supposed that there were no Antonies on earth still, and that these would be satisfied to adopt it. On the contrary, there were holy men who were but impelled into a re-action of the most rigid asceticism by this semblance of a reconciliation between their brethren and the world. Such was St. Romuald in the tenth century, the founder of the Camaldolese, who, through a long life of incredible austerities, was ever forming new monastic stations, and leaving them when formed, from love of solitude. Such St. Bruno, the founder of the Carthusians, whose conversion, as described in the well-known legend, points to the union in his day of intellectual gifts and dissoluteness of life. "Come, dear friends", he is represented as saying to some companions, "what is to become of us? If a man of this doctor's rank and repute, of such literary, such scientific attainments, of such seeming-virtuous life, of so wide a reputation, is thus indubitably damned, what is to become of poor creatures of no estimation, such as we are?"⁸ Such, again, was St. Stephen of Grandimont, who, when two Cardinals came to see and wonder at him in his French desert, excused himself by saying, "How could we serve churches and undertake cures, who are dead to the world, and have every member of our body cut off from this life, with neither feet to walk, nor tongues to speak withal?"⁹ These, and others such, sought out for themselves a seclusion and silence, most congenial to the original idea of monachism, but incompatible with those active duties,—missions, the pastoral office, teaching in the schools, and disputations with

They made a compromise,

and occasioned a re-action.

⁸ Martin, *Ampl. Coll.* t. 6, p. 153.

⁹ *Ibid.*, p. 1063.

heresy,—which at the time there were none but monks to fulfil.

Their
vocation
degraded

Would that nothing worse than the demand of such sacred duties brought the monasteries into the world, and drove these reformers into the desert! It cannot be denied that the gravest moral disorders had arisen within their walls; and that, partly indeed from the seductions of ease, wealth, and the homage of mankind, but, in a great measure also from the political troubles of the times, which exposed them to the tyranny of the military chief, or the violence of the marauder. Relaxation will easily take place in a religious community, when, from whatever circumstance, it cannot observe its rule; and what orderly observance could there be, when the country round about was the seat of war and rapine? Nay, a simpler process of monastic degeneracy followed from the high hand of military power. Kings seized the temporalities of the abbeys for their favourites, and made licentious soldiers bishops and abbots; and these, by their terrors and their bribes, fostered a lax irreligious party in the heart of these communities up and down the country. This part of the history, however, does not concern us in these pages, which are devoted to the consideration of the real work of the Benedictine, not to the injuries or interruptions which it has sustained, or to corruptions which are not its own.

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On the other hand, not kings alone interfered with St. Benedict. A not less forcible overruling of his tradition took place from another quarter, where there was authority for the act, and where nothing would be done except on religious principles and with religious purposes. It was a more serious interference, for the very reason that it was a legal one, proceeding from the Church herself. According to the maxim, “*sacramenta propter homines*”, she has never hesitated to consider, in this sense of the maxim, that “the end justifies the means”; and, since Regulars of whatever sort are her own creation, she can of course alter, or adapt, or change, or bring to nought, according as her needs require, the institutions which she has created. Necessity has no law, and charity has no reserves; and she has acted accordingly. She brought the Benedictine from his cloister into the political world; but, as far as she did so, let it be observed, it was her act, and not his. If then, on account of the necessities of the day, she has overruled his resolve, and made him do what

neither his tradition nor his wishes suggested, such instances cannot fairly be taken, either as specimens of Benedictine work, or as modifications of the Benedictine idea.

And such cases abound. St. Benedict himself had with difficulty contemplated the idea of a priest in the ranks of his children; laying it down in his Rule, "If a priest asks to be received in any monastery, his request must not quickly be granted; but if he persists, the whole discipline of the rule is binding on him without any relaxation". (c. 60.) But Pope Gregory, who had himself been torn violently from the cloister, spared his religious brethren as little as he had himself been spared. He made a number of them bishops. From his own convent on the Cælian he sent Augustine and his companions to be apostolic missionaries to the Anglo-Saxons, and he designed to put the entire episcopate and priesthood of the newly converted race, and thereby their secular concerns, into the hands of the monks.¹⁰ As to the Archbishops of Canterbury, they actually were monks down to the twelfth century.¹¹ This is but a specimen of what was carried out by the Holy See on the continent in the centuries which followed Gregory; but here too the Pope's action is external to the Benedictines, who are as little compromised by his consecrating hand as by the iron glove of the feudal tyrant.

To whatever extent, however, these innovations went, whether they were simple profanations, or were made and ratified by the wise policy of those who had a right to make them, and whatever show they make in history from the circumstance of their necessary connection with public events, with principal cities, and with prominent men, we cannot speak of them as constituting any great exception to the monastic discipline, or as exerting any considerable influence on the monastic spirit, till we have surveyed the religious institutions of Christendom as a whole, and measured them by the side of the general view thus obtained. We had occasion in our former article to allude to the condition of the early monks, their various families, the rise of the Benedictines, and the process of

yet such exceptions scarcely anomalies,

¹⁰ Thomass. Disc. Eccl. t. i., p. 674

¹¹ "Uno excepto, qui ob hanc præsumptionem et alia depositus per Romanum Pontificem fuit". Eadmer ap. Nat. Alex. t. 6, p. 599. St. Thomas in consequence made himself a monk, when he came to the see.

assimilation and absorption, by which at length St. Benedict gathered under his own rule the disciples of St. Martin, St. Cæsarius, and St. Columban. And even when the whole monastic body was Benedictine, it was not on that account moulded upon one type, or depended upon one centre. As it had not spread out from one origin, so it neither was homogeneous in its construction, nor simple and concordant in its action. It propagated itself variously, and had much of local character in its secondary dispositions. We cannot be certain what it was in one place, by knowing what it was in another. One house attained more nearly to what may be called its normal idea than another, and therefore we have no right to argue that such quasi-secularizations as we have noticed, extended much further than those particular cases which history has handed down to us.

And then, on the other hand, we must bear in mind how vast was the whole multitude of persons who professed the monastic life, and, compared with it, how small was the number of those who were called away to active political duties or who gave themselves to study. They might all be subtracted from the sum total of religious, and, as far as number goes, they would not have been missed. We have already referred to the exuberance of Egyptian monachism. Antony left to Pachomius the rule of 50,000. Posthumus of Memphis presided over 5,000; Ammon over 3,000. In the one city of Oxyrinchus there were 10,000. Hilarion in Syria had from 2,000 to 3,000. Martin of Gaul was followed to the grave by 2,000 of his disciples. At that date, the sees of the whole of Christendom, according to Bingham, did not go much beyond 1,700.¹² If every bishop then had been a monk, the general character of monastic life would not have been much affected. In a later age, the monastery of Bangor contained 2,000; that of Banchor, county Down, according to St. Bernard, "many thousand monks", one of whom founded as many as 100 monasteries in various places.¹³ Again, the Episcopal Sees of France are given in the *Gallia Christiana* as 160, including the provinces of Utrecht, Cologne, and Treves; and precisely that number of monastic houses is said to have

¹² Thomassin. Disc. Eccles. t. i. p. 702. Gibbon, ch. 37. Bing. Antiqu. b. 9.

¹³ Cambden Hist. vol. 3, p. 618.

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whole
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return in his old age to the cloister which he had left. As to the Schools of learning, it will be our business now to show how undisputatious was the master, and how unexciting the studies.

Monastic schools of secular literature,

after various preludes,

The rise and extension of these Schools seems to us as great an event in the history of the Order, as the introduction of the sacerdotal office into the number of its functions. If Pope Gregory took a memorable step in turning monks of his convent into missionary bishops charged with the conversion of England, much more remarkable was the act of Pope Vitalian, in sending the old Greek monk Theodore to the same island, to fill the vacant see of Canterbury. We call it more remarkable, because it introduced an actual tradition into the Benedictine houses, and consecrated a system by authority. It is true that from an early date in the history of monachism, extensive learning had been combined with the profession of a monk. St. Jerome was only too fond of the Cicero and Horace, whom he put aside; and, if out of the whole catalogue of ecclesiastics we had to select a literary Father, the monk Jerome, *par excellence*, would be he. In the next century Claudian Mamercus, of Vienne, employed the leisure which his monastic profession gave him to gain an extensive knowledge of Greek and Latin literature. He collected a library of Greek, Roman, and Christian books, “*quam totam, monachus*”, says Sidonius of him, “*virente in ævo, secretâ bibit institutione*”.¹⁵ And in the century after, Cassiodorus, the cotemporary of St. Benedict, is well known for combining sacred and classical studies in his monastery. The tradition, however, of the cloister was up to that time against profane literature, and Theodore reversed it.

founded as a tradition by Theodore.

This celebrated man made his appearance at the end of the century which the missionary Augustine opened, and just about the time when the whole extent of England had been converted to the Christian faith. He brought with him Greek as well as Latin Classics, and set up schools for both the learned languages in various parts of the country. Henceforth the curriculum of the Seven Sciences is found in the Benedictine schools. From Theodore¹⁶ proceeded Egbert and the school of York; from Egbert

¹⁵ Mabillon Annal. Bened. t. 1, p. 32.

¹⁶ Vid. Daniel, Etudes Classiques, p. 100, etc.; Launoy, de Scholis. Opp. t. 4. 1.

came Bede, and the school of Jarrow; from Bede, Alcuin, and the schools of Charlemagne at Paris, Tours, and Lyons. From these came Raban and the school of Fulda; from Raban, Walafrid and the school of Richenau; Lupus and the school of Ferrières. From Lupus, Heiric, Remi, and the school of Rheims; from Remi, Odo of Cluni; from the dependencies of Cluni, the celebrated Gerbert, afterwards Pope Sylvester the Second, and Abbo of Fleury, whom we have already introduced to the reader's notice, though not by name, in the former part of this sketch, as repaying a portion of the debt which the Franks owed to the Anglo-Saxons, by opening the schools of Ramsey Abbey, after the inroad of the Danes.

And now, at length, in addressing ourselves to the question, how such studies can be considered in keeping with the original idea of the monastic state, we think it right to repeat an explanation, which we made at an earlier stage of our discussion, to the effect that we are proposing nothing more than a survey of the venerable order of St. Benedict from without; and we claim leave to do as much as this by the same right by which the humblest among us may freely and without offence gaze on sun, moon, and stars, and form his own private opinion, true or false, of their materials and their motions. And with this proviso, we remind the reader, if we have not sufficiently done so in our present pages, that the one object, immediate as well as ultimate, of Benedictine life, as history presents it to us, was to live in purity and to die in peace. The monk proposed to himself no great or systematic work, beyond that of saving his soul. What he did more than this, was the accident of the hour, spontaneous acts of piety, the sparks of mercy or beneficence, struck off in the heat, as it were, of his solemn religious toil, and done and over almost as soon as they began to be. If to-day he cut down a tree, or relieved the famishing, or visited the sick, or taught the ignorant, or transcribed a page of Scripture, this was a good in itself, though nothing was added to it to-morrow. He cared little for knowledge, even theological, or for success, even though it was religious. It is the character of such a man to be contented, resigned, patient, and incurious; to create or originate nothing; to live by tradition. He does not analyze, he marvels; his intellect attempts no comprehension of this multiform world, but on the contrary it is hemmed in, and shut up within it. It recognizes

In order to preserve the Benedictine idea.

but one cause in nature and in human affairs, and that is the First and Supreme; and why things happen day by day in this way, and not in that, it refers immediately to his will.¹⁷ It loves the country, because it is his work; but “man made the town”, and he and his works are evil. This is what may be called the Benedictine idea, then viewed in the abstract; and, as being such, we gave it the title of “poetical”, when contrasted with that of other religious orders; and we did so, because we considered we saw in it a congeniality, *mutatis mutandis*, to the spirit of a Poet, who has perhaps greater title to that high name than any one else, as having received a wider homage, and that among nations in time, place, and character, further removed from each other.¹⁸

Now supposing the historical portrait of the Benedictine to be such as this, and that we were further told that he was concerned with study and with teaching, and then were asked, keeping in mind the notion of his poetry of character, to guess what books he studied and what sort of pupils he taught, we should without much difficulty conclude, that Scripture would be his literature, and children would be the members of his school.¹⁹ And, if we were further asked, what was likely to be the subject-matter of the schooling imparted to these boys, probably we should not be able to make any guess at all; but we surely should not be very much surprised to be told, that

¹⁷ Quoties videtur contra naturam aliquid evenire, quodammodo non contra naturam est, quia rerum natura hoc habet eximium, ut à quo est, semper ejus obtemperet jussis. Paschas. p. 155, Opp. ed. 1618.

¹⁸ This analogy between the monastic institute and Virgil is recognized by Cassiodorus, who, after impressing on his monks, in the first place, the study of Holy Scripture and the Fathers, continues, “However, the most holy Fathers have passed no decree, binding us to repudiate secular literature; for in fact such reading prepares the mind in no slight measure for understanding the sacred writings”. Presently, “In some cases indeed, Frigidus obstiterit circum præcordia sanguis”, so as to hinder a man’s perfect mastery whether of human or divine letters; but even with but a poor measure of knowledge, *he may be able to choose the life which follows in the next verse*, “Rura mihi et rigui placeant in vallibus amnes”; for “*it is even congenial to monks to have the care of a garden, to till the land, and to take interest in a good crop of apples*”—de Inst. div. litt. 28. Here, by the bye, is in fact the same contrast between the “Felix qui” and the “Fortunatus est ille”, which is suggested to the reader in our former article (*Atlant.*, vol. i. p. 17). Mr. Keble, in a passage of his beautiful Prelections, p. 648, considers Virgil to allude to Lucretius in the “Felix”, while he ascribes to himself the “Fortunatus”.

¹⁹ Mos in Benedictino ordine usatissimus scholas instituere, et pueros cùm pietate tum litteris imbuere. Dachery in Lanfranc. Opp. p. 28. Brower. Antiqu. Fuld., pp. 35–38.

they had children for scholars, Scripture and classics for matter.

the same spirit which led him to prefer the old basilicas for worship instead of any new architecture of his own inventing, and to honour his emperor or king with spontaneous loyalty more than by theological definitions, would also induce him, in the matter of education, to take up with the old books and subjects which he found ready to his hand in the pagan schools, as far as he could religiously do so, rather than venture on any experiments or system of his own.²⁰ This, as we have already intimated, was the case. He adopted the Roman curriculum, that is, nominal-ly the Seven Sciences, professed the Seven Sciences, began with Grammar, that is, the Latin classics, and, if he sometimes finished with them, it was because his boys left him ere he had time to teach them more. His choice of subjects was his fit recompense for choosing. He adopted the Latin writers from his love of prescription, because he found them in possession. But there were in fact no writings, after Scripture, more congenial, from their fresh and natural beauty, and their absence of intellectualism, to the monastic temperament. Such were his schoolbooks; and, as "the boy is father of the man", the little monks, who heard them read or pored over them, when they grew up, filled the atmosphere of the monastery with the tasks and studies with which they had been imbued in their childhood.

For so it was, strange as it seems to our ideas, these boys were monks²¹—monks as truly as those of riper years. and the children were monks, About St. Benedict's time the Latin Church innovated upon the discipline of former centuries, and allowed parents, not only to dedicate their infants to a religious life, but to do so without any power on the part of those infants, when they came to years of reason, to annul the dedication. This discipline continued for five or six centuries, beginning with the stern Spaniards, nor ending till shortly before the pontificate of Innocent the Third. Divines argued in behalf of it from the case of infant baptism, in which the sleeping soul, without being asked, is committed to the most solemn of engagements; from that of Isaac on the Mount, and of Samuel, and from the sanction of the Mosaic Law; and they would be confirmed in their course by the instances of compulsion, not uncommon in the

²⁰ On the monastic schools taking up the imperial, vid Guizot Civil. vol. 2, p. 100, etc. Vid. also Ampère, Hist. Lit., t. 2, p. 277.

²¹ Thomass. Disc. Eccles, t. 1., 821.

early centuries, when high magistrates or wealthy heads of families were suddenly seized on by the populace or by synods, and against their remonstrances, tonsured, ordained, and consecrated, before they could well take breath and realize to themselves their change of station. Nor must we forget the old Roman law, the spirit of which they had inherited, and which gave to the father the power even of life and death over his refractory offspring.

and the
monas-
tery
a boys'
school.

However, childhood is not the age at which the severity of the law would be felt, which bound a man by his parent's act to the service of the cloister. While these oblates were but children, they were pretty much like other children; they threw a grace over the stern features of monastic asceticism, and peopled the silent haunts of penance with a crowd of bright innocent faces. "Silence was pleased", to use the poet's language, when it was broken by the cheerful, and sometimes, it must be confessed, unruly voices of a set of school-boys. These would sometimes, certainly, be inconveniently loud, especially as St. Benedict did not exclude from his care lay-boys, destined for the world. It was more than the devotion of some good monks could bear; and they preferred some strict Reform, which, among its new provisions, prohibited the presence of these uncongenial associates. But, after all, it was no great evil to place before the eyes of austere manhood and unlovely age a sight so calculated to soften and to cheer. It was not adolescence, with its curiosity, its pride of knowledge and its sensitiveness, with its disputes and emulations, with its exciting prizes and its impetuous breathless efforts, which St. Benedict undertook to teach: he was no professor in a university. His convent was an infant school, a grammar school, and a seminary: it was not an academy. Indeed, the higher education in that day scarcely can be said to exist. It was a day of bloodshed and of revolution; before the time of life came, when the university succeeds the school, the student had to choose his profession. He became a clerk or a monk, or he became a soldier.

Children
dedi-
cated by
their
parents

The fierce northern warriors, who had won for themselves the lands of Christendom with their red hands, rejoiced to commit their innocent offspring to the custody of religion and of peace. Nay, sometimes with the despotic will, of which we have just now spoken, they dedicated them, from or before their birth, to the service of Heaven. They determined, that some at least of their lawless race

should be rescued from the contamination of blood and licence, and should be set apart in sacred places to pray for their kindred. The little beings,²² of three or four or five years old, were brought in the arms of those who gave them life, to accept at their bidding the course in which that life was to run. They were brought into the sanctuary, spoke by the mouth of their parents, as at the font, put out their tiny hand for the sacred corporal to be wrapped round it, received the cowl, and took their place as monks in the monastic community. In the first ages of the Benedictine Order, these children were placed on a level with their oldest brethren. They took precedence according to their date of admission, and the gray head gave way to them in choir and refectory, if junior to them in monastic standing. They even voted in the election of abbot, being considered to speak by divine instinct, as the child who cried out, "Ambrose is Bishop".²³ If they showed waywardness in community meetings, inattention at choir, ill behaviour at table, which certainly was not an impossible occurrence, they were corrected by the nods, the words, or the blows of the grave brother who happened to be next them: it was not till an after time, that they had a prefect of their own, except in school hours.

That harm came from this remarkable discipline, is only the suggestion of our modern habits and ideas; that it was not expedient for all times follows from the fact that at a certain date it ceased to be permitted. However, that, in those centuries in which it was in force, its result was good, is seen in the history of those heroic men whom it nurtured, and might have been anticipated from the principle which it embodied. The monastery was intended to be the paternal home, not the mere refuge of the monk: it was an orphanage, not a reformatory; father and mother had abandoned him, and he grew up from infancy in the new family which had adopted him. He was a child of the house; there were stored up all the associations of his wondering boyhood, and there would lie the hopes and interests of his maturer years. He was to seek for sympathy in his brethren, and to give them

gained a
new pa-
rentage
and
home,

²² Calmet, *Reg. Bened.*, t. 2, pp. 2, 4, 116, 278, 335-6, 380, 385. Vid. also Thomassin. *Disc. Eccl.*, t. 1, p. 821, and Magagnotti's *Dissert.* in Fleury's *Disc. Pop. Dei*.

²³ Calmet, t. 2, p. 324. This early dedication of the monk might tend to suggest or defend the abuse of boy priests. Vid. S. Bernard. *de Off. Ep.* 7.

his own in return. He lived and died in their presence. They prayed for his soul, cherished his memory, were proud of his name, and treasured his works. A pleasing illustration of this brotherly affection meets us in the life of Walafriid Strabo, Abbot of Richenau, whose poems, written by him when a boy of fifteen and eighteen, were preserved by his faithful friends, and thus remain to us at this day. Walafriid is but one out of many, whose names are known in history, dedicated from the earliest years to the cloister. St. Boniface, Apostle of Germany, was a monk at the age of five; St. Bede came to Wiremouth at the age of seven; St. Paul of Verdun is said by an old writer to have left his cradle for the cloister; St. Robert entered it as soon as he was weaned; Pope Paschal the Second was taken to Cluni, Ernof to Bec, the Abbot Suger to St. Denis, from their "most tender infancy".

and began their education with the Psalter.

Infants can but gaze about at what surrounds them, and their learning comes through their eyes. In the instances we have been considering, their minds would receive the passive impressions which were made on them by the scene, and would be moulded by the composed countenances and solemn services which surrounded them. Such was the education of these little ones, till perhaps the age of seven; when, under the title of "pueri",²⁴ they commenced their formal school-time, and committed to memory their first lesson. That lesson was the Psalter—that wonderful manual of prayer and praise, which, from the time when its various portions were first composed down to the last few centuries, has been the most precious *viaticum* of the Christian mind in its journey through the wilderness. In early times St. Basil speaks of it as the popular devotion in Egypt, Africa, and Syria; and St. Jerome had urged its use upon the Roman ladies whom he directed. All monks were enjoined to know it by heart; the young ecclesiastics learned it by heart; no bishop could be ordained without knowing it by heart; and in the parish schools it was learned by heart. The Psalter, with the Lord's Prayer and Creed, constituted the *sine quâ non* condition of discipleship. At home pious mothers, as the Lady Helvidia, whom we have already introduced to the reader, taught their children the Psalter. It was only, then, in observance of a universal law,²⁵ that the Benedictine children were taught it;—they mastered it,

²⁴ Calmet, t. 1, p. 495.

²⁵ Thomass. Disc., t. 2, p. 280, etc.



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tion of Christian life than the acquisition of knowledge. At fourteen, when the term of boyhood was complete,²⁷ the school time commonly ended too, the lay youths left for their secular career, and the monks commenced the studies appropriate to their sacred calling. The more promising youths, however, of the latter class were suffered or directed first to proceed to further secular studies; and, in order to accompany them, we must take some more detailed view of the curriculum, of which Grammar was the introductory study.

This curriculum,²⁸ derived from the earlier ages of heathen philosophy, was transferred to the use of the Church on the authority of St. Augustine, who in his *de Ordine* considers it to be the fitting and sufficient preparation for theological learning. It is hardly necessary to refer to the history of its formation; we are told how Pythagoras prescribed the study of arithmetic, music, and geometry; how Plato and Aristotle insisted on grammar and music, which, with gymnastics, were the substance of Greek education; how Seneca speaks, though not as approving, of grammar, music, geometry, and astronomy, as the matter of education in his own day; and how Philo, in addition to these, has named logic and rhetoric. Augustine, in his enumeration of them, begins with arithmetic and grammar, including under the latter history; then he speaks of logic and rhetoric; then of music, under which comes poetry, as equally addressing the ear; lastly, of geometry and astronomy, which address the eye. The Alexandrians, whom he followed, arranged them differently; viz., grammar, rhetoric, and logic or philosophy,²⁹ which branched off into the four mathematical sciences of arithmetic, music, geometry, and astronomy. And this order was adopted in Christian education, the first three sciences being called the Trivium, the last four the Quadrivium.

Grammar was taught in all these schools; but for those who wished to proceed further than the studies of their boyhood, seats of higher education had been founded by Charlemagne in the principal cities of his Empire, under the name of public schools,³⁰ which may be considered the

²⁷ Calmet, Reg., t. 1, p. 495.

²⁸ Brucker Phil. t. 3, p. 594, etc. Appul. Florid. iv. 20.

²⁹ The Quadrivium was called "philosophy". Ampère, t. 3, p. 267.

³⁰ Charlemagne's schools taught Grammar, Rhetoric, Leges, Canones, Theology biblical and patristical. Vid. Thomass. Disc. t. 3, p. 271-294; Ampère Hist., t. 3, p. 267.

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shadow, and even the nucleus of the universities which arose in a subsequent age. Such were the schools of Paris, Tours, Rheims, and Lyons in France; Fulda in Germany; Bologna in Italy. Nor did they confine themselves to the Seven Sciences above mentioned, though it is scarcely to be supposed, that, in any science whatever, except Grammar, they professed to impart more than the elements. Thus we read of St. Bruno of Segni (A.D. 1080), after being grounded in the “*litteræ humaniores*”, as a boy, by the monks of St. Perpetuus near Aste, seeking the rising school of Bologna for the “*altiores scientiæ*”.³¹ St. Abbo of Fleury (A.D. 990), after mastering, in the monastery of that place, grammar, arithmetic, logic, and music, went to Paris and Rheims for philosophy and astronomy; and afterwards taught himself rhetoric and geometry. Raban (A.D. 822) left the school of Fulda for a while for Alcuin’s lectures, and learned Greek of a native of Ephesus. Walafrid (A.D. 840) passed from Richenau to Fulda. St. William (A.D. 980), dedicated by his parents to St. Benedict at St. Michael’s near Vercellæ, proceeded to study at Pavia. Gerbert (A.D. 990), one of the few cultivators of physics, after Fleury and Orleans, went to Spain.³² St. Wolfgang (A.D. 994), after private instruction, went to Richenau. Lupus (A.D. 840), after Ferrières, was sent for a time to Fulda. Fulbert too of Chartres (A.D. 1000), though not a monk, may be mentioned as sending his pupils in like manner to finish their studies at schools of more celebrity than his own.³³

History furnishes us with specimens of the subjects taught in this higher education. We read of Gerbert lecturing in Aristotle’s *Categories* and the *Isagogæ* of Porphyry; St. Theodore taught the Anglo-Saxon youths Greek and mathematics; Alcuin, all seven sciences at York; and at some German monasteries there were lectures in Greek,³⁴ Hebrew, and Arabic. The monks of St. Benignus at Dijon gave lectures in medicine; the

with the addition of languages and the fine arts.

³¹ Vit. ap. Brun. Opp. ed 1759.

³² Brucker, t. 3, p. 646.

³³ Thomass. Disc. t. 2, p. 296-8.

³⁴ Fredegodus of Canterbury (A.D. 960) wrote in Greek Vid. Cave’s Hist. Litt. in nom. In the Life of St. Odo of Canterbury we read that his patron Athelm “*Græcâ et Latinâ linguâ magistris edocendum eum tradidit, quarum linguarum plerisque, tunc temporis in gente Anglorum usus erat, à discipulis beatæ memoriæ Theodori archiepiscopi profectus. Factusque est in utrâque linguâ valdè gnarus, ita ut posset poemata fingere, continuare prosam, et omnia, quicquid ei animo sederet, luculentissimo sermone proferre*”. Mabillon Act. Sæc 5, p. 289.

abbey of St. Gall had a school of painting and engraving; the blessed Tubilo of that abbey was mathematician, painter, and musician.³⁵ We read of another monk of the same monastery, who was ever at his carpentry, when he was not at the altar; and of another, who worked in stone. Hence Vitruvius was in repute with them. Another accomplishment was that of copying manuscripts, which they did with a perfection unknown to the scholastic age which followed them.³⁶

Literary
tastes of
the
monks;

These manual arts, far more than the severer sciences, were the true complement of the Benedictine ideal of education, which, after all, was little more than a fair or a sufficient acquaintance with Latin literature. Such is the testimony of the ablest men of the time. "To pass from Grammar to Rhetoric, and then in course to the other liberal sciences", says Lupus, speaking of France, is "*fabula tantum*".³⁷ "It has ever been the custom in Italy", says Glaber Radulphus, writing of the year 1000, "to neglect all arts but Grammar".³⁸ Grammar, moreover, in the sense in which we have defined it, is no superficial study, nor insignificant instrument of mental cultivation, and the school-task of the boy became the life-long recreation of the man. Amid the serious duties of their sacred vocation, the monks did not forget the books which had arrested and refined their young imagination. Let us turn to the familiar correspondence of some of these more famous Benedictines, and we shall see what were the pursuits of their leisure, and the indulgences of their relaxation. Alcuin, in his letters to his friends, quotes Virgil again and again; he also quotes Horace, Terence, Pliny, besides frequent allusions to the heathen philosophers. Lupus quotes Horace, Cicero, Suetonius, Virgil, and Martial. Gerbert quotes Virgil, Cicero, Horace, Terence, and Sallust. Petrus Cellensis quotes Horace, Seneca, and Terence. Hildebert quotes Virgil and Cicero, and refers to Diogenes, Epictetus, Cræsus, Themistocles, and other personages of Greek history. Hincmar of Rheims quotes Horace. Paschasius Radbert's favourite authors were Cicero and Terence. Abbo of Fleury was especially familiar with

³⁵ We quoted in our former article a passage from Brower on the arts cultivated at Fulda. For a parallel in the East, vid. the account of the monks of Theodore Studita, vit. p. 29, Sismond.

³⁶ Guizot. Civil., t. 2, p. 236; Hallam, Lit. i., 1, 87.

³⁷ Ep 1.

³⁸ Muratori Dissert. 43, p. 831.

Terence, Sallust, Virgil, and Horace; Peter the Venerable, with Virgil and Horace; Hepidamn of St. Gall took Sallust as a model of style.³⁹

Nor is their anxiety less to enlarge the range of their classical reading. Lupus asks Abbot Hatto through a friend for leave to copy Suetonius's Lives of the Cæsars, which is in the monastery of St. Boniface in two small *codices*. He sends to another friend to bring with him the Catilinarian and Jugurthan Wars of Sallust, the Verrines of Cicero, and any other volumes which his friend happens to know either that he has not, or possesses only in faulty copies, bidding him withal beware of the robbers on his journey. Of another friend he asks the loan of Cicero's *de Rhetoricâ*, his own copy of which is incomplete, and of Aulus Gellius. In another letter he asks the Pope for Cicero's *de Oratore*, the Institutions of Quintillian, and the commentary of Donatus upon Terence. In like manner Gerbert tells Abbot Gisilbert, that he has the beginning of the *Ophthalmicus* of the philosopher Demosthenes, and the end of Cicero's *Pro rege Deiotaro*; and he wants to know if he can assist him in completing them for him. He asks a friend at Rome to send him by Count Guido the copies of Suetonius and Aurelius which belong to his archbishop and himself; he requests Constantine, the lecturer (scholasticus) at Fleury, to bring him Cicero's *Verrines* and *de Republicâ*, and he thanks Remigius, a monk of Treves, for having begun to transcribe for him the *Achilleid* of Statius, though he had been unable to proceed with it for want of a copy. To other friends he speaks of Pliny, Cæsar, and Victorinus. Alcuin's Library contained Pliny, Aristotle, Cicero, Virgil, Statius, and Lucan; and he transcribed Terence with his own hand.

Not only the memory of their own youth, but the necessity of transmitting to the next generation what they had learned in it themselves, kept them loyal to their classical acquirements. They were, in this aspect of their history, not unlike the fellows in our modern English universities, who first learn and then teach. It is impossible, indeed, to overlook their resemblance generally to the elegant scholar of a day which is now waning, especially at Oxford, such as Lowth or Elmsley, Copleston or Keble, Howley or

³⁹ The School of Ouen produced 500 writers in 50 years. Landriot, p. 138. Vid. the curious Letter of Gunzo, Marten., Ampl. Coll. t. 1, p. 294.

Parr, who thought little of science or philosophy by the side of the authors of Greece and Rome. Nor is it too much to say, that the Colleges in the English Universities may be considered in matter of fact to be the lineal descendants or heirs of the Benedictine schools of Charlemagne.⁴⁰ The modern of course has vastly the advantage in the comparison; for he is familiar with Greek, has an exacter criticism and purer taste, and a more refined cultivation of mind. He writes, verse at least, far better than the Benedictine, who had commonly little idea of it; and he has the accumulated aids of centuries in the shape of dictionaries and commentaries. We are not writing a panegyric on the classical learning of the dark age, but describing what it was; and, with this object before us, we observe, that, whatever the monks had not, a familiar knowledge and a real love they had of the great Latin writers, and we assert moreover, that that knowledge and love were but in keeping with the genius and character of their institute. For they instinctively recognized in the graceful simplicity of Virgil or of Horace, in his dislike of the great world, of political contests and of ostentatious splendour, in his unambitious temper and his love of the country, an analogous gift to that religious repose, that distaste for controversy, and that innocent cheerfulness which were the special legacy of St. Benedict to his children. This attachment to the classics is well expressed by a monk of Paderborn,⁴¹ who, when he would describe the studies of the place, suffers his prose almost to dissolve into verse, as he names his beloved authors,

Viguit Horatius,
Crispus et Sallustius,

magnus et Virgilius,
et urbanus Statius.

*Ludusque fuit omnibus,
Et dictaminibus*

*insudare versibus,
jucundisque cantibus.*

⁴⁰ "If Colleges, with their endowments and local interests . . . are necessarily . . . of a national character, it follows that the education which they will administer will also be national, and adapted to all ranks and classes of the community. And if so, then again it follows that they will be far more given to *the study of the Arts* than to the learned professions, or to any special class of pursuits at all; and such in matter of fact has ever been the case. They have *inherited* under changed circumstances the position of *the monastic teaching founded by Charlemagne*, and have *continued* its primitive traditions, through, and in spite of, the noble intellectual developments, to which Universities have given occasion". Newman's Office and Work of Universities, p. 340, l.

⁴¹ Vid. Daniel, p. 115. Lauãriot, p. 139.

The latter of these stanzas, as they may be called, illustrates what we have wished to express, in speaking of the classical temperament of the Benedictines. As far as they allowed themselves in any recreation, which was not of a sacred nature, they found it in these beautiful authors, who might be considered as the prophets of the human race in its natural condition. How strongly they contrast in this respect to the scholastic age which swallowed them up! Amid the religious or ecclesiastical matters which were the subject of their correspondence, questions of grammar and criticism are mooted, and a loving curiosity about the nicety of languages is temperately indulged. Whether *rubus* is masculine or feminine, is argued from analogy and by induction; Ambrose makes it feminine, and the names of trees, which have no plurals, are feminine, as *populus*, *fraxinus*; on the other hand Virgil makes it masculine, and Priscian allows it to be an exception to the rule. Again, is it *dispexeris* or *despexeris*? Priscian says *despicio*, and makes *de* answer to the Greek *κατὰ*, down; but the Greek in the Psalm is, not *κατίδης*, but *ὑπερίδης*, above. Again, is the penultima of *voluerimus* long or short? long, says Servius on Virgil.⁴² They carry their fidelity to the Classics into their own poetical compositions; far from resigning themselves to that merely rhythmical versification, which is ever grateful to the popular ear, which had been in use from the Augustan era, and which afterwards developed into *rhyme*,⁴³ they rather affect the archaisms and the licences of the classical era. “Contraria rerum”, “genus omne animantum”, “retundier”, “formarier”, “benedicier”, “scribier”, “indupediret”, “indunt,” savour of Ennius or Lucretius rather than of Virgil. They keep to the Augustan metres, and they are never unwilling to use them. Their theological treatises begin, their epistles to kings end, with hexameters and pentameters. They moralize, they protest, they soothe their sorrows, they ask favours, they compile chronicles, they record their journeys, in heroics, elegiacs, and epigrams. They are versifiers, one and all, or at least those whose names or works are best known in history or in our libraries. The habit was formed at school, and it endured through life. Some indeed, as Lupus or Gerbert, had too many external occu-

⁴² Alcuin, Ep. 23; Lupus, Ep. pp. 5, 8, 20, 34.

⁴³ Vid. Muratori Dissert. 40.

pations for the task; but others, as Theodulf, bishop of Orleans, return to it in the evening of life, after the manner of Gregory Nazianzen in patristic times, or Lord Wellesley in our own. Bede, Alcuin, Aldhelm, Raban, Theodulf, Hildebert, Notgar, Adelhard, Walafriid, Agobard, Florus, Modoin, Heiric, Gerbert, Angilbert, Herman, Abbo, Odo, Hucbald, Lupus, Fridouard, Paschasius, with many others, all wrote verse. We are not insinuating that they wrote it so happily as the Patriarch of Constantinople or the Governor-General of India; on the contrary, it was not their *forte*; but Florus, for instance, is eloquent, and Walafriid Virgilian.⁴⁴ Their subjects, when most sacred, are such as the great phenomena of nature, the country, woods, mountains, flocks, and herds, plants, flowers, and others which we have called Benedictine. We cannot occupy our pages with extracts; but we are induced, as a specimen of what we mean by the alliance of St. Benedict and Virgil, to quote the concluding lines of the Hortulus of Walafriid, which presents us a very pretty picture of an old monk amid children and fruit trees:—

Hæc tibi servitii munuscula vilia parvi
 Strabo tuus, Grimalde pater!
 Ut, cùm conseptu viridis consederis horti,
 Inter apricatas frondenti germine malos,
 Persicus imparibus crines ubi dividit umbris,
 Dum tibi cana legunt tenerâ lanugine poma,
 Ludentes pueri, schola lætabunda tuorum,
 Atque volis ingentia mala capacibus indunt,
 Grandia conantes includere corpora palmis,
 Quo moneare habeas nostri, pater alme, laboris,
 Dum relegis quæ dedo volens, interque legendum
 Et vitiosa secas bonus, et placentia firmas.

We have taken a liberty with the last line, which any how is somewhat feeble.

their
 prose.

Their prose is superior to their verse; it has little claim indeed to the purity of taste and of vocabulary, which we call classical; but it is good Latin both in structure and in idiom. 'At any rate the change is wonderful, when we pass from the Benedictine centuries to those which followed.

Ex-
 amples.

We take, for instance, a letter from Lupus to Ebroin

⁴⁴ Du Pin, however, says "Theodulf's poems are very fine". Cent. 8, p. 126, ed. 1699. "Tolerable poetry", says Dr. Murdock, on Mosheim, vol. 2, p. 151.



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frui potest ; per hanc etiam actibus suis dominatur. Unde, sicut homo dimittens divitias, vel personas conjunctas, eas abnegat, ita deserens propriæ voluntatis arbitrium, per quod ipse sui ipsius dominus est, se ipsum abnegare invenitur.—*Opusc.* 17, p. 400.

of Pas-
chasius

For a second contrast, let us on the one hand take Paschasius, who thus writes in the beginning of his commentary on St. Matthew.

Unde nimirum Demetrius, Antiocho regi vim divinæ legis cùm exponeret, aiebat, teste Josepho, quemdam Theopompum extitisse nomine, qui volens ex divinis litteris in suâ historiâ quippiam contrectare, ilico mente turbatus fuit plus ferme triginta diebus, donec veniam vix precibus impetraret. Ac deinde, quod fuerit ei per visum cœlitus declaratum, hoc illi ideo accidisse, quoniam irreligiôsè divina scrutatus esset, atque hominibus ea proferre impuris vellet, etc. *Bibl. Max. P. t. 14, p. 358.*

with
Moneta,

On the other hand Moneta, a contemporary of St. Dominic.

Quod autem sit provisor animalium, patet secundum philosophos et in veritate. Dedit enim animalibus membra instrumentalia, et præter hoc intimavit eis modum utendi illis ; alioquin, esset supervacaneum. In quo apparet Dei providentia etiam cum non utentibus ratione.—p. 502.

not in
dis-
respect
towards
the Do-
mini-
cans,

Now, we must not be imagined, in making this contrast, to have any disrespectful meaning as regards those great authors whose Latinity happens not to be equal to their sanctity or their intellectual power. Their merit, in respect to language, is of a different kind ; it consists in their success in making the majestic and beautiful Latin tongue minister to scientific uses, for which it was never intended. But, because they have this merit of their own, that is no reason why we should deny to the writers who preceded them the praise of being familiar with the ancient language itself, a praise which is justly theirs, though seldom allowed to them. The writers of the Benedictine centuries are supposed to have the barbarism, without the science, of the Dominican period ; and modern critics, who wish to be fair, seem to consider it a great concession, if they grant that an age must at least have some smattering in classical literature, which, as the foregoing pages show, is ever quoting it and referring to it. Thus Mr. Hallam, in the opening chapter of his *Literature of Eu-*

rope, can but say, "Alcuin's own poems *could at least not* but in have been written by one *unacquainted* with Virgil". vindica-
 Again: "From this time, though *quotations* from the tion of
 Latin poets, especially Ovid and Virgil, and *sometimes* the Bene-
 from Cicero, are *not very* frequent, they occur sufficiently dictines.
 to show that manuscripts had been brought to *this* side of
 the Alps"—p. 7. Some pages lower he says, quoting some
 of St. Adalhard's verses, "the quotation from Virgil in
 the ninth century *perhaps deserves remark, though* in one
 of Charlemagne's monasteries it is not by any means *asto-*
nishing"; as if Virgil were not the text book in the north-
 ern schools, as our foregoing quotations make clear, and
 ignorance, in that day, when it was to be found, had not
 its special seat in the southern side of the Alps, not in
 France and Germany. Passages such as these in men
 of wide research simply perplex us. We ask ourselves
 whether we have rightly understood their words, or whe-
 ther we read wrongly the historical facts which they pro-
 fess to be generalising. Perhaps it is that we assume
 without warrant that the quotations of Alcuin and the rest
 are *bonâ fide* such, and not derived, as some have said,
 from catenas of passages, commonplace books, or tradi-
 tionary use;⁴⁵ but such an account of them is absolutely
 inconsistent, first, with the testimonies which we have
 above cited, as to the actual studies of the young, and next,
 with the literary habits which those studies actually formed
 in the persons who were exercised in them. Can it be
 that critics of the nineteenth century, possessing the fine
 appreciation of classical poetry imparted in the public
 schools of England, glance their eye over the rude versi-
 fication of Theodulf or Alcuin, and consider it the mea-
 sure of the secular learning which gave it birth? M.
 Guizot, Protestant as he is, is a fairer and kinder
 judge of the cloister literature, than Mr. Hallam or Dean
 Milman.

And now, to prevent misapprehension of our meaning
 in this review of the Benedictine schools, we have two

⁴⁵ "Bede . . . had some familiarity with Virgil, Ovid, Lucan, Statius, and even Lucretius. . . . It may be questioned, however, whether many of the citations from ancient authors, often adduced from mediæval writers, as indicating their knowledge of such authors, are more than traditional, almost proverbial, insulated passages, brilliant fragments, broken off from antiquity, and reset again and again by writers borrowing them from each other, but who had never read another word of the lost poet, orator, or philosopher".—Milman, *Latin Christ.* vol. 2, p. 39.

remarks to make before we conclude, one on each side of the description to which that review has led us.

Literary pursuits consist-ent with sanctity.

On the one hand, the classical studies and tastes which we have been illustrating, even though foreign to the monastic masses, as they may be called, even though historically traceable to the mission of St. Theodore from the Holy See to England, must still be regarded a true offspring of the Benedictine discipline, and in no sense the result of seasons or places of relaxation and degeneracy. At first sight, indeed, there is some plausibility in saying that with the change of times a real change came over a portion of a great family of monks, and that, however usefully employed, Cassiodorus or Theodore, Alcuin or Walafrið, did certainly fall from their proper vocation, and did really leave it to Romuald and others like him, to be, not only the most faithful imitators, but to be only true children of the ancient monachism. And, in confirmation of this view, it might be added, that the same circumstances which led the monks to literary pursuits, led them to political entanglements also, and that in the same persons, as Theodulf, Lupus, and Gerbert, learning and secular engagements were combined; and that, as no one would say that the cares of office were proper to a monk's vocation, as little could be fairly included in it classical attainments. Whatever be the best mode of treating this difficulty, which of course demands a candid and equitable consideration, here, in addition to what we have said by the way, we shall make one answer of different kind, which seems to us conclusive, and there leave the question. When, then, we are asked whether these studies are but the accidents and the signs of a time of religious declension, we reply that they are found in those very persons, on the contrary, who were preëminent in devotional and ascetic habits, and who were so intimately partakers in the spirit of mortification, whether of St. Benedict or St. Romuald, that they have come down to us with the reputation of saints,—nay, have actually received canonization or beatification. Theodore himself is a saint; Alcuin and Raban are styled “*beati*”; Hildebert is “*venerable*”; Bede and Aldhelm are saints; and we can say the same of St. Angilbert, St. Abbo, St. Bertharius, St. Adalhard, St. Odo, and St. Paschasius Radbert. At least Catholics must feel the full force of this argument; for they cannot permit themselves to attribute any dereliction of vocation to those whom the Church holds up as choice specimens

of divine power, and, as being such, miraculously sealed for eternal bliss.

This is our remark on one side the question; on the other, it must not of course be supposed,—indeed our last remark negatives the idea,—that critical scholarship or classical erudition was the business of life, even in the case of this minority of the monastic family, who took so prominent a part in the education of their time. We have distinctly said, that, after their school years, the monks were as little taken up with the classics, *exceptis excipiendis*, as members of parliament or country gentlemen at the present day. They had their serious engagements, as statesmen have now, though of a different kind, and to these they gave themselves. Theology was their one study; to theology secular literature ministered, first as an aid and an ornament, then as a relaxation, amid the mental exertion which it involved. Nor was this literature cultivated without some holy jealousy on the part of the cultivators; “*nuces pueris*”;—there was a time of life when it ought to be put aside; there was even a danger of its seductiveness. Alcuin himself, if we may trust the account, reproved on one occasion the study, at least of the poets; and in one of his extant letters he complains of a former pupil, then raised to the episcopate, for preferring Virgil to his old master Flaccus, that is, himself, and prays that “the four Gospels, not the twelve *Æneids*, may fill his breast”. *Ep.* 129. St. Paschasius too, in spite of his love for Terence and Cicero, expresses a judgment, in one passage of his comment upon Ezekiel (*Bibl. Max. P. t.* 14, *p.* 788), against the elder monks being occupied with the heathen poets and philosophers. Lanfranc, when an Irish Bishop asked him some literary question, made answer, “*Episcopale propositum non decet operam dare hujusmodi studiis*; we passed in these our time of youth, but, when we took on ourselves the pastoral care, we bade them farewell”. *Ep.* 33. The instance of Pope Gregory is well known; when the Bishop of Vienne had been led to lecture in the classics, he wrote, “A fact has come to our ears, which we cannot name without a blush; that you, my brother, lecture on literature” (*grammatica*). *Ep.* xi. 54. Such occupations, indeed, were in those centuries generally and reasonably held to be inconsistent with the calling of a Bishop.⁴⁶ St. Jerome speaks as strongly in an earlier age.

and not
engross-
ing,

unsuit-
able in
Bishops

⁴⁶ Vid. Thomass. Disc. Eccl., t. 2, pp. 268–286.

The true
study of
monks,

Theo-
logy,
that is,
Holy
Scrip-
ture,

as con-
trasted
with the
Fathers
and the
school-
men,

What was true of the Bishop was on the whole true of the monk also; he might perhaps have special duties as the *scholasticus* of his monastery, but ordinarily, while his manual labour was either in the field or in the *scriptorium*, so his intellectual exercises were for the most part combined with his devotional, and consisted in the study of the sacred volume. This was mainly what at that time was meant by theology. "Theologia, hoc est, Scripturarum meditatio", says Thomassin (*Disc. Ecc. t. 2, p. 288*). Their theology was a loving study and exposition of Holy Scripture, according to the teaching of the Fathers, who had studied and expounded it before them. It was a loyal adherence to the teaching of the past, a faithful inculcation of it, an anxious transmission of it to the next generation. In this respect it differed from the theology of the times before and after them. Patristic and scholastic theology, each involved a creative action of the intellect; that this is the case as regards the Schoolmen, need not be proved here; nor is it less true, though in a different way, of the theology of the Fathers. Origen, Tertullian, Athanasius, Chrysostom, Augustine, Jerome, Leo, are authors of powerful, original minds, and engaged in the production of original works. There is no greater mistake, surely, than to suppose that a revealed truth precludes originality in the treatment of it. The contrary is acknowledged in the case of secular subjects, in which it is the very triumph of originality not to invent or discover what perhaps is already known, but to make old things read as if they were new, from the novelty of aspect in which they are placed. This faculty of investing with associations, of applying to particular purposes, of deducing consequences, of impressing upon the imagination, is creative; and though false associations, applications, deductions, and impressions are often made, and were made by some theologians of the early Church, such as Origen and Tertullian, this does but prove that originality is not coëxtensive with truth. And so in like manner as to Scripture; to enter into the mind of the sacred author, to follow his train of thought, to bring together to one focus the lights which various parts of Scripture throw upon his text, and to give adequate expression to the thoughts thus evolved, in other words, the breadth of view, the depth, or the richness, which we recognize in certain early expositions, is a creation. Nor is it an inferior faculty to discriminate, rescue, and adjust the

truth, which a fierce controversy threatens to tear in pieces, at a time when the ecclesiastical atmosphere is thick with the dust of the conflict, when all parties are more or less in the wrong, and the public mind has become so bewildered as not to be able to say what it does or what it does not hold, or even what it held before the strife of ideas began. In such circumstances, to speak the word evoking order and peace, and to restore the multitude of men to themselves and to each other, by a reassertion of what is old with a luminousness of explanation which is new, is a gift inferior only to that of revelation itself.

This gift is not the characteristic of the history, nor is it akin to the spirit or the object, as we have described them, of the Benedictine Order. At the time of which we are writing, the Christian athlete, after running one length of the stadium, was taking breath before commencing a second course: the Christian combatant was securing his conquests in the wide field of thought by a careful review and catalogue of them, before going forth to make new ones. He was fitly represented, therefore, at such a season by the Benedictine, faithful, conscientious, affectionate, and obedient, like the good steward who keeps an eye on all his master's goods, and preserves them from waste or decay. First, then, he compared, emendated, and transcribed the text of Scripture; next he transcribed the Fathers who directly or indirectly commented on it; then he attached to its successive portions such passages from the Fathers as illustrated them; then he fused those catenated passages into one homogeneous comment of his own: and there he stopped. He seldom added anything original. In such a task the skill would lie in the happy management and condensation of materials brought together from very various quarters, and here he would find the advantage of the literary habits gained in his early education. A taste for criticism would be another result of it, which we see in Bede, and which would result in so much of leaning to the literal interpretation of Scripture as was consistent with the profession of editing and republishing, as it may be called, the comments of the Fathers. We see this tendency in Alcuin, Paschasius, and especially in Druthmar. Indeed, Alcuin's greatest work was the revision of the Scripture text.⁴⁷ Other commentators were Ansbert, Sma-

and as suitable to a time of peace between times of controversy.

Their literal interpretation of Scripture.

⁴⁷ Codex, Alcuini labor, in Vallicellensi Bibliothecâ asservatur. Baron. an. 778.

ragdus, Haymo, Remi, and the Irish Sedulius, if he was a Benedictine. The most widely celebrated, however, of these works was the *Glossa Ordinaria* of Walafrid, which was in great measure an abridgment of Raban's *Catena*, and became a standard authority in the centuries which followed.

But controversy came upon them;

But times were approaching when such peaceful labours were not sufficient for the Church's need, and when theology needed to be something more than the rehearsal of what her champions had achieved and her sages had established in ages passed away. As the new Christian society, which Charlemagne inaugurated, grew, its intellect grew with it, and at last began to ask questions and propose difficulties, which *catenæ* and commentaries could not solve. Hard-headed objectors were not to be subdued by the reverence for antiquity and the amenities of polite literature; and, when controversies arose, the Benedictines found themselves, from the necessity of the times, called to duties which were as uncongenial to the spirit of their founder as the political engagements of St. Dunstan or St. Bernard. Nor must it be supposed that the other parts of Christendom did not furnish matters demanding their theological acumen, even though none had arisen in the Frankish Churches themselves. And here, we conceive, we have this remarkable confirmation of the identity of the Benedictine character, that, in proportion as these matters were in substance already decided by the Fathers, they acquitted themselves well in the controversy, and in proportion as these matters demanded some original explanations, the monastic disputants were less successful. And in speaking of them, we speak of course of their age itself, of which they were leading teachers, and which they represent. And we speak, not of individual monks, who would have the natural talents, the intellectual acuteness and subtlety of other men, but of the action of the monasteries, considered as bodies and historically, which is the true measure of the mental discipline to which their Rule subjected them. We speak of those whose duty lay, by virtue of their vocation, not in confronting doubts but in suppressing them, and who were not likely on the whole to succeed in exercises of reason in which they had no practice.

that of the Adoptionists,

One of the countries to which we allude, as being at the era of Charlemagne the seat of theological error, was Spain, then under the power of the Saracens. The vic-



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Controversy
with
their own
people,

Meanwhile the spirit of inquiry was alive and operative even within the hearts of these peaceful monastic communities themselves. We find it, as it would seem, in one of the immediate friends and pupils of Alcuin. Fredegis, of the school of York, to whom he addressed various of his letters and works, and whom he made his successor at Tours, has left behind him an argumentative fragment of so strange a nature that it has been thought a mere exercise in disputation and not a portion of a serious work.⁵⁰ He starts moreover with a proposition in favour of the supremacy of reason as contrasted with authority, which, though admitting of a Catholic explanation, is capable also of being made the basis of a philosophy to which we shall immediately have occasion to allude.⁵¹ Soon after, Gotteschalck, a monk of Orbais, taught that the decree of divine predestination has direct reference to the lost as well as the saved; and about the same time Ratramn of the monastery of Corbie, opposed the Catholic doctrine of the Holy Eucharist. But these intellectual movements within the Benedictine territory were eclipsed by a manifestation of the sceptical spirit which came from a country, where from its prevalent religious temperament such a phenomenon was little to have been expected.

and with
the Scots.

There was a portion of the Western Church which had never been included in the Roman Empire, and but partially, if at all, included within the range of the Benedictine discipline. While that discipline made its way northward, became the instrument of Anglo-Saxon conversion, and even supplanted the rule of Columban in the French monasteries, the countrymen of Columban remained faithful to their old monachism, descended southwards a second time, and retaliated on the convents of the continent by a fresh introduction of themselves and their traditions. At this period, whatever may have been their literary attainments, they were more remarkable for a bold independence of mind, a curiosity, activity, and vigour of thought, which contrasted strongly with the genius of Bede and Raban. Their strength lay in those exercises of pure reason which go by the name of "philosophy", or of "wisdom". Thus in an ancient writer the Irish Scots are spoken of as "*sophiâ clari*".⁵² By Heric of Auxerre, in

⁵⁰ Vid. Ittig. Biblioth., p. 313.

⁵¹ Vid. Neander, vol. 6, p. 161; Baluz. Miscell., t. 2, p. 56.

⁵² Brucker Philos., t. 3, p. 574.

the passage so often quoted, they are described as “*philosophorum greges*”, venturing across the stormy sea to the wide continent of Europe. And so in the legendary account, by a monk of St. Gall, of the Irish scholars who accosted the Frankish Emperor, they are represented as crying out, “Who wants *wisdom?* who will buy *wisdom?*” Dunstan, again, is said to have learned “*philosophy*” in Ireland; and Benedict of Aniane, the second founder of the Benedictines, is expressly described as looking with suspicion on their syllogistic method, which was so hostile to the habits of mind which his own Order cultivated. These Irish scholars, indeed, were too sincere Catholics, viewing them in the mass, to warrant this jealousy; but it was not without foundation, as we shall see, as regards individuals, and at least would have abundant warrant in the judgments of those who differed so much from them in mental characteristics as did the Benedictines. On the other hand there was much in the Anglo-Saxon temper intimately congenial with the latter: then, as now, the occupants of the British soil seem to have been practical rather than speculative, fond of hard work rather than of hard thought, tenacious of what they had received, jealous of novelty, the champions of law and order. Thus the English and Irish may be said so far to represent respectively the two great Orders which came in succession on the stage of ecclesiastical history; and, as they were not without their collisions at home, so we detect some instances, and may conjecture others, of their rivalry as missionaries and teachers in central Europe. We read, for instance, in the history of St. Boniface, that one of his antagonists in his organisation of the Churches which he had founded in Germany, was an Irish priest of the name of Clement. Boniface relates, if his account is to be received to the letter, that this priest neither allowed the authority of Jerome, Augustin, or Gregory, nor of the sacred canons; that he maintained the marriage of bishops; argued from Scripture in defence of marriage with a sister-in-law, and taught a sort of universalism. Another Irishman, with whom Boniface had a quarrel, was Virgil, afterwards Bishop of Salzburg, who has been acknowledged, as well as Boniface, for a saint. He offended Boniface by maintaining what seems like a doctrine of the existence of *antipodes*.

The antagonism between the two schools extended into the next century. Of course John Scotus Erigena, whom

Erigena.

Charles the Bald placed in the chair of Alcuin in the School of the Palace, is the palmary specimen of the philosophical party among the Irish monks. This remarkable man, while acknowledging the authority of Revelation, laid it down as a first principle of his speculations, as Fridegis had done before him, that reason must come first, and authority second. Such a proposition indeed was faulty only in its application; for St. Austin himself had laid it down in his treatise *de Ordine*. It is self-evident that we should not know what was revelation and what was not, unless we used our reason to decide the point. Whatever we are obliged in the event to learn from external sources, our process of inquiry must begin from within. The ancient Father whom we have mentioned propounds both the principle and the sense in which it is true. "We learn things necessarily in two ways", he says, "by authority and by reason. *Tempore auctoritas, re autem ratio prior est*"; but Erigena, as is generally agreed, accounted reason, not only as the ultimate basis of religious truth, but the direct and proper warrant for it; and, armed with this principle, he proceeded to take part in the two controversies which we have already had occasion to mention, the Predestinarian and the Eucharistic. "The writings have come to us", says the church of Lyons, speaking of his tendencies, like Clement's, to universalism, "the writings have come to us, *vaniloqui et garruli hominis*, who, disputing on divine prescience and predestination with human, or, as he boasts, philosophical reasonings, without any deference to Scripture, or regard to the authority of the Holy Fathers, has dared to define by his own independent assertion what is to be held and followed". Thus Erigena adopted Clement's argumentative basis, as well as his doctrine. His views upon reason and authority are distinctly avowed in the first book of his work *De divisione naturæ*. "You are not ignorant", he argues, "that what is *prius naturâ* ranks higher than what is *prius tempore*. We have been taught", referring apparently to St. Austin, "that reason is prior in nature, authority in time; now, whereas nature was created together with time, authority did not begin with the beginning of time and nature; on the other hand, reason had its origin with nature and time in the first beginning of things". The Scholar replies to him, "Reason itself teaches this; for authority has proceeded from right reason, reason by no means from authority.

For all authority which is not approved by right reason is weak; whereas right reason, when it is fortified in its own strength, settled and immovable, need not be corroborated by the concurrence of any authority". *lib. 1. n. 71.* In like manner, in the commencement of his work on Predestination, while appealing to St. Austin, he makes philosophy and religion convertible terms.⁵³

Erigena was succeeded in the Schola Palatii by Mannon, who inherited his master's philosophy. He himself had called Plato the greatest of philosophers, and Aristotle the most subtle of investigators; and, according to the testimony of Friar Bacon, he was a successful interpreter of the latter writer; and Mannon, in like manner, has left commentaries on Plato's *de Legibus* and *de Republicâ* and on Aristotle's Ethics. About the same time flourished in France another Irishman, named Macarius; and he too showed the same leaning towards pantheism which has been imputed to Erigena.⁵⁴ From him this error was introduced into the monastery of Corbie. At a later date we hear of one Patrick, who from his name may be considered as an Irishman, holding the same heterodox opinion about the Eucharist, which Ratramn and Erigena advanced.⁵⁵

His successors.

As to the two controversies, which have been mentioned more than once, while they exemplify to us the *scholasticismus ante scholasticos* then in action, they afford fresh illustrations also of the insufficiency of such instruments as the Church at that time had in her service, to meet this formidable antagonist of her religious supremacy. No mind equal to Erigena appeared on the side of traditionary teaching; and the vigour with which the Adoptionists were condemned and the *Filioque* inserted in the Creed, did not manifest itself in the dealing of the Frankish Synods with the bold doctrine of Gotteschalch and Ratramn. Gotteschalch, as we have said, was a monk of Orbais. We suddenly find him asserting categorically that the reprobate have been predestined to damnation from eternity. Raban and the Synod of Mentz condemned this doctrine. Hincmar and the Synod of Quiercy condemn it also; and Pardulus, bishop of Laon, writes against it. Then Lupus writes, if not in defence of Gotteschalch, at least not in accordance with Hincmar, who,

Controversy about Predestination.

⁵³ Guizot Civil, t. 2, p. 375.

⁵⁴ Lanigan Hist., vol. 3, p. 320.

⁵⁵ Vid. Rather. Ep. apud Dach. Spic., t. 1., p. 375.

in distress for a champion, has recourse to no other than Erigena, and Erigena, as might be expected from what has been said above, proceeded to commit himself to an extreme doctrine of universalism, as Gotteschalch had to an extreme predestinarianism. Upon this, Florus and Prudentius write against Erigena; and Remigius, explaining or espousing the thesis of Gotteschalch, writes against the three Epistles of Raban, Hincmar, and Pardulus. Hincmar replies in a second Synod of Quiercy; and the Bishops of Lorraine rejoin in the Synod of Valence. The controversy ceases rather than terminates at the Synod of Savonnières, in which all parties were represented, and in which four important articles were received, bearing indirectly on the subject of dispute, but leaving without distinct notice the original position of Gotteschalch.

Controversy about the Holy Eucharist.

In the eucharistic controversy, which lasted through several centuries, the Benedictine Paschasius, supported by Haimo, Hincmar, and Ratherius, expounded the traditional doctrine afterwards defined: but his statements were met by the dissent, or the hesitation, as it would appear, of men of his own schools, Raban, Ratramn, Amalarius, Heribald, Heriger, Druthmar, and Florus. At the end of two centuries indeed appeared the great Benedictines Lanfranc and Anselm, who dealt successfully with this as well as other controversies. But it must be recollected that, though their school of Bec is confessedly the historical fountainhead of the new theology which was making its way into Christendom, it is as little a fair specimen of the Benedictine character in matters of teaching, as such imperial minds as their brother-monk and contemporary, Hildebrand, can fairly represent their institute in ecclesiastical politics.

Transition of Benedictines to the Dominicans.

And thus the period, properly Benedictine, ended; this honour being shown by Providence to the great Order from which it is named, in reward for its long and patient services to religion, that, though its monks were not to be immediately employed by the Church in the special sense in which they had been her ministers for some hundreds of years, still they should be the first to point out, and they should hand, those new weapons, which an Order of a different genius was destined to wield against a new description of opponents.

Nor is it without significance that the Anglo-Saxon Church, itself the creation of the Benedictines, and the

seat from which their influence went out for the education or conversion of Europe from the Baltic to the Bay of Biscay, should have its share in this honour; and that, as Theodore was brought all the way from Tarsus to Canterbury, so Lanfranc from Lombardy and Anselm from Piedmont should successively fill the archiepiscopal throne of Theodore.

JOHN H. NEWMAN.



ART. II.—*On the Dates of the Nativity and Crucifixion.*
By W. H. SCOTT.

IT is generally known that the correctness of what is called the Vulgar or Anno Domini æra, though it seems to have been admitted without question during the period of the middle ages, has, since the revival of letters, been not disputed merely, but universally denied; or in other words, that though we popularly speak of the present year as the 1858th since the Birth of Christ, yet in fact more than 1858 years have elapsed since that event happened. What, however, within the limits of several years, is the true date of the Nativity, and in connection with this, and as partly depending upon it, that of the Crucifixion also, is a point on which they who have most carefully examined the subject at one period or another, have come to different conclusions. These conclusions, indeed, have an increasing tendency to converge as time advances; but at present it cannot be said that they have been brought into harmony, or that any really satisfactory view of the subject has yet been offered. This deficiency it is the aim of the following pages, so far as possible, to supply. My object, accordingly, will be to state, as I proceed, the various difficulties besetting the whole question of these two points of chronology; to give the existing materials for the determination of it; to examine the results arrived at by those who have most carefully sifted and combined these materials; and, lastly, to draw the conclusion forced upon myself by the consideration of the whole field of inquiry,—a conclusion not wholly agreeing with that of any other investigators in this field, but which, I feel satisfied, will alone adequately solve the complica-

State-
ment of
subject.

tions necessarily besetting the problem on every other hypothesis.

Origin of
A.D.
æra.

The subject may be conveniently opened by stating the origin of the Anno Domini æra now in use. It was invented by Dionysius Exiguus (according to Blair's Chronological Tables, in 516 A.D., but according to other authorities) in 526; and he based his computation of it simply on two passages of St. Luke's Gospel (iii. 1, and iii. 23), namely, the statement that St. John the Baptist, the immediate forerunner of our Lord, began his ministry in the fifteenth year of the reign of the emperor Tiberius, and the announcement in the same chapter, that our Lord at the time of His baptism by St. John, an event which took place "whilst all the multitude were being baptized", and therefore, as it is natural to suppose, in the same year, ἦν ὡσεὶ ἐτῶν τριάκοντα ἀρχόμενος; that is, if we adopt the most reasonable interpretation the words admit, "was about beginning His thirtieth year". It is known that the reign of Tiberius began on the 19th of August, in the year of the foundation of Rome 767; accordingly nothing, it would seem, could be better grounded than the inference drawn by Dionysius, that our Lord, towards the termination of the fifteenth year of Tiberius' reign, when His baptism must have taken place, was terminating His twenty-ninth year; whence it would follow that the fifteenth of Tiberius would be the period from August 28, of our Lord's life, to August 29; and hence the first year of His life would synchronise with the year of the foundation of Rome 754 (A.D. 1); or in other words, He would have been born (if we accept the tradition as to the month) in the December of the preceding year, that is, in the year called in our received chronological system B.C. 1, or A.U.C. 753.

Why the
A.D. æra
is wrong

The calculation of the year of the Nativity thus arrived at was generally accepted, as before said, until in process of time a discovery was made which at once threw it into confusion. This discovery was the circumstance that Herod the Great, he who slaughtered the Holy Innocents in the massacre of Bethlehem, died about the time of the Passover (or Easter) of B.C. 4. Our Lord, who was conveyed into Egypt to escape that massacre, and who was actually in Egypt at the time of the death of Herod, must consequently have been born, at the very latest, in December B.C. 5; in other words, four years, at the least, earlier than Dionysius' computation. If Herod, there-



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The true
dates are
B.C. 8,
and A.D.
33.

Proofs
that
Herod
the Gt.
died
Easter
B.C. 4,
1. from
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more than a millennium, has come full circle, the absolute correctness of the Dionysian æra of the sixth century having actually been reasserted by Rondet, a French writer, in the eighteenth,⁴ along with A.D. 33 as the date of the Crucifixion; the ground which he takes up being, that no other chronology is compatible with the Scriptural *data*, and that all other authorities must give way to Scripture. For myself, I am certainly unable to accept so summary a conclusion as this last to all previous researches; on the contrary, I accept of both the extremes of the chronological expansion just spoken of, and undertake to establish them; in other words, I assert the date of the Nativity, on the one hand, to be B.C. 8, and that of the Crucifixion, on the other, to be A.D. 33. And I now proceed to the proof of this, by examining the date, on which everything else turns, of the death of Herod. That he died, then, at the Passover of B.C. 4, is established as follows:

1. The length of his reign is accurately recorded by Josephus, both in the "Antiquities" and in the "War": "Herod died, having reigned thirty-four years from the death of Antigonus, and thirty-seven years from the time when he was created king by the Romans".⁵ Now the decree by which he was made king was passed by the senate in the consulship of Cn. Domitius Calvinus and C. Asinius Pollio; that is, in A.U.C. 714, or B.C. 40, the years being counted according to the Jewish rule in reference to kings' reigns, which was that the computation began not from the day on which they came to the throne, but from the beginning of the year containing that day.⁶ The years of Herod are therefore counted from the new moon of the Jewish month Nisan, in B.C. 40, which happened in that particular year on April 3. Not less explicit is the statement as to the actual commencement of his reign, three years afterwards, when he took Jerusalem and wrested the sovereign power from the hands of Antigonus. "This calamity", says Josephus, "befell the city of Jerusalem in the consulship of M. Agrippa and Caninius Gallus". That he took Jerusalem in this year is further

⁴ Reprinted in Zaccaria, "Dissertazioni", Rome, 1840 (Diss. 9 and 10).

⁵ "Antiquities", xvii. 10. "War", i. 21.

⁶ For the citations and facts here given, which are common to all the later writers on the subject of Herod's death, see especially Patrizi (Patritius de Evangelis, Friburg, 1853), and Lardner, vol. i. Append. on Time of Herod's death; also Mr. Browne's Ordo Sæclorum.

confirmed by the notice in Josephus, that this event happened “on the same day on which, twenty-seven years earlier, the city had been taken by Pompey”; for it is known from the same writer that Pompey took Jerusalem in the consulship of M. Cicero and C. Antonius (A.U.C. 691), which is just twenty-seven years earlier than the consulship of Agrippa and Caninius Gallus, according to the inclusive method of reckoning employed by Josephus. This second beginning of the reign of Herod is therefore to be fixed at the new moon of Nisan, A.U.C. 717, or B.C. 37, a day falling in that year on the 1st of April. Accordingly, whether we compute from the first or second beginning of Herod’s reign, we discover in either case that it terminates somewhere between 1 Nisan in B.C. 4, and the day before 1 Nisan in B.C. 3.

2. So far then it has been proved that the year of the death of Herod was either B.C. 4 or B.C. 3. But of these two possible dates, that the true one is B.C. 4, is confirmed in the strongest manner by astronomical evidence. “Thus much”, says Ideler,⁷ “has been long and generally acknowledged, that our vulgar æra, which is derived from Dionysius, is under-calculated by at least four years”; and, among various evidences of this, the one which is all-important is the partial eclipse of the moon which occurred on the night of the 12th—13th of March, A.U.C. 750, or B.C. 4. “According to the account in Josephus, there arose during the last illness of Herod a rebellion, at the head of which stood the scribe Matthias. He caused the guilty parties to be burned, and on the night on which this happened was an eclipse of the moon. This eclipse”, says Ideler, “I have accurately calculated. According to Delambre’s solar, and Mayer’s and Mason’s lunar tables, it began at Jerusalem (2h. 13m. east of Paris) at 1h. 38m., and ended at 4h. 12m., A.M., true time. . . . In the year 750 no other lunar eclipse was visible at Jerusalem; and A.U.C. 751, to which year some chronologists refer the death of Herod, there was no lunar eclipse whatever”. Kepler, Petavius, and the Maurists in the “Art de vérifier les dates”, according to Patrizi, similarly assign the eclipse to the night in question. “This eclipse then, as falling necessarily at the full of the moon, preceded the Passover of B.C. 4 by just one lunation”; and as it is further evident

⁷ Ideler *Handbuch der Mathematischen und Technischen Chronologie*; and *Ord. Sæcl.* i. S. 24, etc.

from Josephus that the death of Herod occurred just before a Passover, this must necessarily have been the Passover of B.C. 4. For had the death of Herod taken place at the Passover of B.C. 3, there must have been an interval between the eclipse and this Passover, not of one month but of thirteen; and this, when the circumstances of the case are examined, is an impossible supposition. It has been objected, indeed, that the events mentioned by Josephus as occurring in the interval between the eclipse and the death of Herod, cannot be compressed into that space of less than a month, which is all that is allowed if the Passover of B.C. 4 was that of Herod's death; but a sufficient answer to this objection is the following statement, which we give in the words of a writer before quoted:—

“The eclipse⁸ took place in the very night after Herod's execution of certain sophists or zealots, who had thrown down a golden eagle, which he had placed over the eastern gate of the Temple. From that time Herod's disease increased in violence. Seeking relief he crossed the Jordan on a visit to the hot springs of Callirhoe, where, as a last resource, his physicians ordered him to be bathed in hot oil. The experiment had nearly proved fatal, and from that time Herod despaired of life. He immediately returned to Jericho. There he received, by the return of his ambassadors whom he had sent to Rome, the imperial rescript, which ordered him to put his son Antipater to death. ‘For a short space’, says Josephus, ‘he revived; but very soon he relapsed, and weary of his life, attempted to lay violent hands upon himself. Antipater, in his prison, hearing the shriek which was raised upon this alarm, and hoping that it betokened his father's death, endeavoured to bribe the jailor to set him at liberty. The jailor went straightway to Herod with information of Antipater's design; and the tyrant in consequence gave peremptory orders on the spot for the execution of his son. This was done; and on the *fifth day* after the execution Herod breathed his last’”.

“Immediately after the funeral and the seven days mourning, Archelaus, who by his father's last will, made within five days of his death, was nominated king of Judæa, went up to Jerusalem; and then, just at the conclusion of the public mourning, was the Passover. All this while, Archelaus was in urgent haste to go to Rome,

⁸ Joseph. Ant. xvii. 6, 5-7; Bell. Jud. I. ii. 2, 3. Ord. Sæcl. 1. c.

to obtain the ratification of his father's last will; on which errand he set sail immediately after the festival. From these details it follows incontestably that the death of Herod preceded the Passover by not more than seven or eight days".

The author of this passage then insists (as does Patrizi) on the perfect possibility of including these various events within the assigned limits, if only we take into account the nearness of Jerusalem to the places (Callirhoe and the Jordan) here mentioned. On the other hand, the difficulties, or rather impossibilities, attending the other alternative, or the supposition of an interval of thirteen months, are well put by Lardner:—If the eclipse, he says, be admitted, and yet it be maintained that Herod died a few days before the Passover of B.C. 3 (the later of the two possible ones), then he must have lived a year after the execution of the rabbies. But this is incredible, considering the description Josephus gives of his illness. "Besides, it is evident that the mourning of the Jewish people for the rabbies, at the Passover next after Herod's death, was very fresh (*πένθος οὐχ ὑπεσταλμένον, ἀλλ' οἰμωγαὶ κ. τ. λ.*), which could not have been if the rabbies had been dead a year before. Moreover, it is evident that Herod's ambassadors were sent away to Rome to know Augustus' pleasure concerning Antipater, some time before the disturbance at the Temple, when the golden eagle was taken down; and it is very plain that Herod lived not many days after the arrival of the ambassadors. So that, according to this opinion, these ambassadors must have spent above a year in their journey from Judæa to Rome and back again, though they were sent upon very pressing business, which is also incredible".

3. A distinct proof that Herod died at the Passover of B.C. 4, and not that of B.C. 3, is contained in the recorded chronology of the reign of his successor Archelaus. Archelaus began to reign, according to Josephus, seven days after the death of his father Herod. It was foretold to him by an Essene that he should reign nine years: so it is said in the "Wars"; but in the "Antiquities", which were written after the "Wars", the length of his reign is given as ten years, this prophecy being the interpretation of a dream in which he saw, as the "Antiquities" says, ten ears of corn devoured by oxen. In another passage also Josephus speaks explicitly of his own father Matthias having been born, "as witnessed by the public registers",

3. from
reign of
Arche-
laus;

in the tenth year of the reign of Archelaus. The passages are easily harmonized by considering him to have reigned nine years complete, and part of a tenth year. Now he was deposed and banished by Augustus in the consulship of M. Æmilius Lepidus and C. Arruntius Nepos, that is, in the interval from the first of January to the first of July, A.U.C. 759. Herod his father, therefore, cannot but have died at the Passover of A.U.C. 750, or B.C. 4; for had he died at that of A.U.C. 751, or B.C. 3, nine complete years could not have elapsed between the date of his death and that of Archelaus' deposition.

4. A final proof that Herod died in B.C. 4, has been deduced from a comparison of the known duration of the tetrarchate of his son Herod Antipas with the date of his banishment, which may be ascertained. For Herod Antipas, the brother of Archelaus, became tetrarch of Galilee on the death of his father; and the circumstances of his deposition and banishment were the following:—He had been calumniated before the emperor Caligula by Herod Agrippa (that same Agrippa who put to death St. James the Apostle), and having no suspicion of what had been done, was persuaded by his wife Herodias to make a journey to Rome for the sake of an interview with Caligula, in the hope that the emperor would be induced to make him king. The result of this interview, which took place at Baiæ in Campania, where Caligula was then staying, was his banishment from the tetrarchy; and it appears that it must have occurred in the summer of A.D. 39.

For Herod Antipas did not start for Rome till after the return of Herod Agrippa to Palestine as king of Judæa; his object being to obtain, at the instigation of his wife, who was jealous of Agrippa's good fortune, an equal dignity for himself. Now Agrippa's return took place in the second year of Caligula, or A.D. 38, and about the time of the beginning of the Etesian winds, that is, at the end of July; for he waited, we are told, for these winds. Herod Antipas therefore, resisting as he did at the outset the entreaties of his wife, and setting out at last only after having made his preparations on the most magnificent scale, could not have started for Italy before the spring of A.D. 39 at the earliest, and could not have arrived in Italy later than the summer of that year at the farthest: for Caligula did not continue at Baiæ later than August in that year; and the possibility of the year following this being the one in which Antipas arrived, is excluded by

4. from
tetrarch-
ate of
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Antipas.

the circumstance that Caligula, after quitting Baiæ, as just said, in A.D. 39, made a military expedition into Gaul, from which he did not return to Rome till the following autumn, by which time the deposition of Antipas had certainly taken place: inasmuch as Caligula had an interview with Herod Agrippa during the autumn of A.D. 40, at Puteoli, and we find Agrippa thanking him for having conferred the tetrarchy of Galilee, which had belonged to Antipas, upon himself.

To conclude, then:—it further appears that Herod Antipas was tetrarch for forty-three years: for this is inferred from the numeral 43 (Μ Γ) which is to be seen upon three of his coins now existing, and is the latest date exhibited by any coin of his having any pretensions to be genuine.⁹ Now if he was deposed, as above shown, in the summer of A.D. 39, then by computing backwards from the beginning of the forty-third year of his tetrarchate, that is, from the first of Nisan A.D. 39, we arrive necessarily at the Nisan of B.C. 4, as the date of his accession to the tetrarchy and of the death of his father. Had the date of these events been the Nisan of B.C. 3, the forty-third year of his reign would have begun, in defiance of the coins, on the first of Nisan A.D. 40, or in other words, half a year after his deposition.

Such is the proof that the death of Herod the Great certainly happened a few days before the Passover of B.C. 4. The determination, however, of the date of his death does not of itself determine that of the Nativity, except so far as to make it certain that our Lord, since He was born and was carried into Egypt before it happened, must at any rate have been born earlier than B.C. 4. It has been usual indeed to acquiesce in the supposition that He was born towards the close of the preceding year, B.C. 5; the ground for this supposition being, partly, unwillingness to disturb the inferences drawn by Dionysius as to the date of the Nativity more than was absolutely necessary (for the further the Nativity is carried backwards, the more difficult does it become to explain the statement in St. Luke of our Lord's age at the time of His baptism), and partly because St. Matthew seems at first sight to speak as if the visit of the wise men, and consequently the flight

But death of Herod does not prove birth of Christ B.C. 5.

⁹ Vaillant's assertion that he had seen one coin bearing 44 (ΜΔ), is considered to be neutralized—1. by the refusal of numismatists to recognize it; 2. by the carelessness he shows in the treatise in which he mentions it. (See Zaccaria, *Diss.* 7 and 10.)

Origin
of mis-
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this
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into Egypt, had taken place within a few days after the Nativity. The difficulties, however, attending this interpretation of St. Matthew's language, will be found insurmountable. This will easily be seen from the very arguments by which Maldonati, one of its defenders, attempts to establish it.

Old
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vity,

Accepting then, as he does, the ordinary tradition that the wise men came thirteen days after the Nativity, he urges that this cannot be far wrong, for the following reasons:—First, because the words of the Evangelist are, “When Jesus was born, behold wise men came”; and here both the connection of the words and the particular expression “behold”, imply, he says, that the coming of the wise men immediately followed the Nativity (here he compares *Genesis* xxix. 9: “They were yet speaking, and *behold* Rachel came with her father's sheep”; and a similar passage, *Genesis* xxiv. 15). Secondly, because it is certain that Joseph and the Blessed Virgin did not remain in Bethlehem beyond the forty days of the purification appointed by the law in *Lev.* xii. 2, for they came immediately to Jerusalem to present the Divine Infant before the Lord (*Luke* ii. 22), and then immediately returned into Galilee, to their own city Nazareth (ii. 39). As the wise men, therefore, found Christ in Bethlehem (*Matt.* ii. 8, 9), this must necessarily have happened earlier than the fortieth day from His Nativity.

Now as to the former of these two arguments, the objection founded on the “connection of the words” is apparently the same with that insisted on by Casaubon¹⁰ and repeated by Vossius;¹¹ namely, that the Greek of the passage being γεννηθέντος Ἰησοῦ, ἰδοὺ, κ. τ. λ., the identity of the time of the Nativity with that of the coming of the wise men is implied in the use of the aorist γεννηθέντος rather than the perfect γεγεννημένου, “ea enim vis est aoristi”; to which the answer is manifest, that the “force of the aorist” is exactly the contrary to what is here said, its time, as the very name aorist implies, being always indefinite, and in consequence often requiring to be expressed in English or Latin by the pluperfect. We translate *Matt.* ii. 13 (κατὰ τὸν χρόνον ὃν ἠκρίβωσε παρὰ τῶν μάγων), “juxta tempus quod exquisierat a magis”; “according to the time which he *had* diligently inquired of the wise

¹⁰ Casaub., *Exercitat.* 2, ad *Annal. Baronii*, c. 9; G. J. Vossii *Dissertatio Gemina, etc., de Natali Anno Christi*, i. 28; also Patrizi *ad loc.*



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An unsatisfactory explanation certainly: for the language of the Evangelist (and that twice repeated, as if to give particular emphasis to the assertion),¹³ distinctly implies that he acted in so doing, not out of his own head, but agreeably to their express statement.

Second
diffi-
culty.

But a greater difficulty even than this is the reconciliation of Maldonati's view with the circumstances of the flight into Egypt. That event certainly occurred as the immediate result of the visit of the wise men to Bethlehem. But if so, the holy family must, on the supposition that the visit of the wise men took place before the Purification, have set out for Egypt not from Bethlehem but from Nazareth; for St. Luke's words are explicit, that "after they had performed all things according to the law of the Lord, they returned into Galilee to their own city Nazareth". Maldonati, accordingly, has nothing for it but to assume this to have been the case. But the assumption itself is at variance with the Gospel narrative in the following respects:—First, the scene of the whole account, as given by St. Matthew, is certainly Bethlehem. The wise men come to Bethlehem; they are warned in sleep not to return to Herod when they leave Bethlehem; and Joseph, after their departure, is warned to fly into Egypt (which he does immediately by night), because Herod "will seek the Child to destroy Him". Now as Herod, agreeably to this warning, sent to Bethlehem to put the children of Bethlehem to death and those of its neighbourhood, so soon as he found he had been deceived by the wise men, it is inconceivable that St. Matthew should have thus written, if in fact, at the very time when the plot was being devised by Herod, our Lord had been beyond the range of his suspicions by being at Nazareth, without something at least of an allusion to such a circumstance. So far, however, from making any such allusion as this, what he does say on the subject implies the direct contrary; for in his notice of the return out of Egypt, he says that Joseph, "hearing that Archelaus reigned in Judæa in the room of Herod his father, was afraid to go thither, and being warned in sleep, retired into the quarters of Galilee, and coming he dwelt in a city called Nazareth". This surely implies that Joseph thought to return into Judæa, that is to Bethlehem, as being the place from which he took his departure when he went into Egypt,

¹³ *Matt.* ii. 7, 16.

and turned aside to Nazareth, his original home, only in consequence of a special supernatural warning to that effect.

Again, Maldonati is obliged, according to his view, to explain away, contrary to all probability, the full force of the words, *Matt. ii. 16.* “*Then* Herod, perceiving that he was deluded by the wise men, was exceeding angry, and sending killed all the men children that were born in Bethlehem”. “The word *then*”, he says, “I do not consider to have an accurate reference to time, as if the meaning were, that immediately upon the departure of the wise men he put the children to death; for that some interval ensued between the departure of the wise men and the slaughter of the children, necessarily follows from the fact of the presentation of Christ in the Temple at Jerusalem on the 27th day (*sic*) after the adoration of the wise men (*Luke ii. 22*), and from the circumstance of the holy family having resided at Nazareth for some time afterwards, according to *Luke ii. 39*; moreover, because it is probable that Herod, blood-thirsty and cruel tyrant as he was, would yet have attempted to discover Christ, and to slay Him only, before putting to death all the children”. Now, undoubtedly, all this “necessarily follows” on the hypothesis that our Lord was visited by the wise men before the Purification; but, apart from that hypothesis, nothing would be less probable than that Herod would have delayed for an instant, so soon as he found that the wise men had played him false, to destroy his dreaded enemy by every possible means; and surely he who, as Maldonati supposes, would have been scrupulous enough to wait under these circumstances, and attempt to discover Christ, before putting to death all the children, would hardly, as the same writer supposes, have been unscrupulous enough to have at last added two years to the time which he had “diligently inquired of the wise men”, in order to be more sure of effecting his purpose.

Thus it appears that the visit of the wise men cannot be supposed to have occurred *before* the Purification, or, in other words, within forty days from the Nativity; and consequently, the only tenable theory on this subject is that advanced in the *Art de vérifier les dates*, being identical, in fact, with that held by Epiphanius, namely, that immediately on the termination of the forty days, the holy family must have returned, as mentioned by St. Luke, to Nazareth; that from Nazareth they must have come

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their
coming.

again after a short time to Bethlehem, and there remained (having probably been induced to return to this city by pious persons who were acquainted with the miraculous facts connected with our Lord's birth, and who in consequence were disposed to accept Him at the outset as the true Messiah);¹⁴ and that it was during this second sojourn at Bethlehem that that visit of the wise men occurred, which was followed by the flight into Egypt and the massacre of the children by Herod. The proof of this second sojourn in Bethlehem, according to the work in question, is the passage already alluded to, in which St. Matthew speaks of St. Joseph as intending, on his return from Egypt, to go into Judæa. What, it well argues, could have been his reason for doing so, but that he had lived in Judæa before going into Egypt? and it points out how agreeable this explanation is to the account in St. Matthew, the plain import of which is, that the flight into Egypt took place from Bethlehem.

A false
view dis-
posed of.

A somewhat different view, indeed, from any yet mentioned has occasionally been maintained, which is this:¹⁵ that the visit of the wise men took place after the Purification, yet not many days after it. The statement in St. Luke, that the holy family returned to Nazareth after the Purification, is accordingly explained, or rather disposed of, by the supposition that they went from Jerusalem to Bethlehem with the intention of going to Nazareth, and that this intention was interrupted by the massacre in Bethlehem and the flight into Egypt; so that it was only put into execution, in fact, on their return from Egypt. But this hypothesis, contradictory as it is at once to the plain words of St. Luke and to the inferences above drawn from those of St. Matthew, has nothing to recommend it; and we are driven to the view advocated, as just said, by Epiphanius and the *Art de vérifier les dates*, as the only one which perfectly harmonizes the facts of the Gospel narrative in St. Matthew with that in St. Luke.

Day of
Nativity
was De-
cember
25;

At this stage of the investigation it becomes necessary to determine, if possible, the day, or at least the month, in which the Nativity took place; and here I naturally have recourse to ecclesiastical tradition. With regard to

¹⁴ Epiphanius, Hæres. LI. 'Ανοήτων, apud G. J. Voss. De Annis J. C. Diss. 1^{ma}. c. xxx.

¹⁵ See Allix, De Anno et Mense Natali J. C., Jenæ, 1740; also Mr. Browne, Ord. Sæcl.

the year of that event, the early Fathers, as every one is aware who has attended to this inquiry, certainly fail to supply the information we might naturally have expected from them. The date of it is a point which they never seem to have examined critically at all. They are not aware of the fact of the death of Herod the Great in B.C. 4, nor, therefore, of the difficulty thus created in the interpretation of St. Luke's notices of time in the history of our Lord's life; and the date of the Nativity which, so far as they agree at all, they may be considered to recognize (that is, B.C. 2, or, occasionally, B.C. 3), cannot, under the circumstances, be considered as more than an inference deduced from the same sources as the Dionysian æra.¹⁶ But with regard to the month and the day, as distinguished from the year, when it took place, the case is different; and the general recognition of the twenty-fifth of December as that day, is based, and may be defended, on the fact of its being the immemorial tradition, as witnessed both by St. Chrysostom and St. Augustine, of the western world.¹⁷ It is also the date assigned in the "Apostolical Constitutions".¹⁸

Thus much, then, appears from my argument so far as it has been carried—that the Nativity at the latest could not have occurred later than December in B.C. 7. It might possibly have occurred earlier, for the length of the sojourn of the holy family in Egypt is not recorded; but it could not have occurred later, for our Lord, in all probability, must have been approaching His second birthday when He was removed into Egypt, and that second birthday itself must have fallen on the 25th of December, B.C. 5, inasmuch as Herod died at the Passover of B.C. 4.

The Nativity, I say, could not have occurred later than B.C. 7, unless we choose to allow any weight to the hypothesis before noticed, that Herod arbitrarily extended the slaughter to children of two years old, though our

and not
later
than
B.C. 7.

Proofs
of this.

¹⁶ "Supponendum est primò, ex Ecclesiæ judicio, id est, ex Conciliorum Summorumve Pontificum decretis, nihil haberi quo verus Christi Natalis annus certò cognoscatur. Supponendum, secundò, maximam esse Sanctorum Patrum inter se, et præcipuorum etiam per omnes ætates Scriptorum in assignando Natali Christi anno dissensionem: Ex quo evidentissimè colligitur, nec illorum nec istorum auctoritate litem hanc dirimi posse"—Alexandri Hist. Eccles. Sæc. I. Diss. II. Quest. I.

¹⁷ Tillemont, Hist. Eccles. Notes sur Jesus Christ. Some unsatisfactory arguments on the other side may be seen in Allix, Dissert. de J. C. Anno et Mense Natali.

¹⁸ Lib. V. c. 14.

Lord had Himself only been born a few weeks. But even supposing this to have been the case, and granting that the difficulties besetting this view can be got over, even then the Nativity cannot be deferred later than the December of B.C. 6; and B.C. 6 is, after all, just as difficult to harmonize with the "thirty years" and "fifteenth of Tiberius" in St. Luke, as B.C. 7, according to the ordinary modes of interpreting those passages. It would be some excuse, I repeat, for evading the force of the argument founded on the age of the children put to death by Herod, if the Nativity, by so doing, could at least be brought down to the December of B.C. 5, where, in fact, the older of our modern chronologists have wished to put it; for B.C. 5 could, perhaps, be more tolerably accommodated to St. Luke's *data*. It has been unanswerably shown, however, in the *Art de vérifier les dates*, that this is impossible. It is impossible, because the interval from December B.C. 5 to the Passover of B.C. 4 is too short to contain all the events recorded in the Gospels as having occurred between the Nativity and the death of Herod, as will be seen on enumerating them. Thus, first, there are the forty days preceding the Purification of the Blessed Virgin; next, the departure of the holy family, according to St. Luke, to Nazareth; then their subsequent return to Bethlehem, and the coming of the wise men; after this, their flight into Egypt—a journey across the desert which must have occupied at the least, in all probability, more than a fortnight (the modern journey from Jerusalem to Cairo on camels may be reckoned at sixteen days); finally, their continuance in Egypt for an indefinite time till the death of Herod.

True date proved to be B.C. 8, or A.U.C. 746;

From the proved impossibility, then, that the Nativity could have occurred later than December B.C. 6, and from the proved improbability that it occurred later than December B.C. 7, I now proceed to the positive arguments in proof that it occurred in December B.C. 8, or A.U.C. 746.

1. from Eusebius;

First, there is the evidence of Eusebius, so far as it goes. In his *Chronicon*, that writer puts the Nativity in the thirty-second¹⁹ of the reign of Herod, and the massacre of the Bethlehemite children in the thirty-fourth,

¹⁹ Lardner, usually a very careful writer, twice quotes the *Chronicon* as putting the Nativity in the thirty-third year of Herod. But I know no authority for this. Were he right, the date would be accurate, viz. B.C. 8.

making Herod himself, as does Josephus, die in his thirty-seventh. On the supposition, then, that Herod died, as I have before proved, at the Passover of B.C. 4, the Nativity would fall as early, according to Eusebius, as B.C. 9. Nor is it to the point to object here that the “*aniles hallucinationes*” of Eusebius have been ridiculed by Scaliger, on the score of the enormous anachronism by which he identifies the thirty-second of Herod with A.U.C. 752. Doubtless he did this in conformity with the opinion of the Fathers, and with the most natural interpretation of the chronological *data* of St. Luke, both of which would assign A.U.C. 752 as the date of the Nativity.²⁰ But the very fact that he considered he might safely assume this synchronism to be a correct one, taken in connection, as it must be, with his accurate knowledge of the length of the reign of Herod, is a reason of itself for supposing that he must have had definite grounds for placing the Nativity in that part of the reign of Herod in which he actually does place it. His ignorance must not be allowed to disturb his knowledge.

Next, there is the evidence of Epiphanius on the same side. “The Saviour”, he says, “was born in Bethlehem of Judæa in the thirty-third year of the reign of the first Herod, son of Antipater, which was the forty-second of the Emperor Augustus. And after two years (*ποιήσας ἔτη δύο*) He was taken by Joseph into Egypt, and He went down into Egypt, and there he passed two years more. And Herod the king died in his thirty-seventh year”.²¹ Here Epiphanius, like Eusebius, and for the same reason, falls into the mistake of identifying the year of the reign of Herod in which he puts the Nativity, with A.U.C. 752 (the “forty-second of Augustus”). But the thirty-third of Herod, all the same, is A.U.C. 746, or B.C. 8. Epiphanius’ date, therefore, of the Nativity is B.C. 8. The same is the date also, and for the same reasons, of Sulpicius Severus.²²

Again, an argument which it is difficult to meet, in proof that the sojourn in Egypt must have lasted at least

2 from Epiphanius;

3. from Matt. ii. 20;

²⁰ To prevent the possibility of confusion, the reader should be reminded that the “15th of Tiberius” was from August, 28 A.D., to August, 29 A.D. Hence, if our Lord was “beginning thirty years” in that year, His Nativity might be put either in B.C. 1 or B.C. 2, according to the half of the year from which the reckoning begins.

²¹ Epiphanius. Adv. Hæres., lib. iii., tom. ii. Antidicomarianitæ, Hæres. 78., § 10., Ed. Petav.

²² Sulp. Sev. Lib. ii.; G. J. Voss. De Nat. Anno J. C. xlii.

a year, has been founded on the exact words of the angel who summoned St. Joseph to return from Egypt: “*They are dead which sought the young Child’s life*”. For, “it being known from Josephus” (I give it in the words of Lardner)²³ “that Antipater died but five days before his father Herod, it may be inferred from the use of the plural number, that Antipater is meant by the angel as well as Herod. But Antipater could have no influence on his father’s counsels for ten months or more before Herod died; therefore the murder of the infants happened, most probably, a year before the death of Herod”. For the crimes of Antipater, which led to his being imprisoned, were discovered when Antipater was at Rome; and seven months had elapsed, according to Josephus, between the period of this discovery and Antipater’s return to Judæa. In a day or two after his return he was tried, convicted, and imprisoned. Then Herod sent messengers to Augustus to announce what had happened. After this came fresh evidence of Antipater’s crimes, and fresh despatches thereupon were sent to Rome; and the answer to these later despatches, authorizing Herod to do with Antipater as he thought fit, was followed after a short interval by Antipater’s death; five days after which Herod himself died. It is therefore “impossible to assign less than three months for the interval between the arrival of Antipater in Judæa and Herod’s death, which, added to the former seven, makes ten months”. And on the probable supposition that the execution made by Herod in his own family, as described by Josephus, happened at the same time with the slaughter of the children of Bethlehem, something like three months would have to be added to these ten, making in all thirteen. “I do allow”, adds the writer I have been quoting, “that it appears to me highly probable that Herod did live a year at least after the slaughter of the infants”.²⁴ But, if so, the date of the Nativity is B.C. 8; for the year in Egypt must be added to the two years of our Lord’s life before He went into Egypt.

4. from universal Again:—It was the opinion of the Fathers that our Lord was born at a time when the civilized world was in

²³ Credibility of Gospel History, ch. III.: Josephus, Bell. Jud. i. 30; Ant. xvii. 3-8.

²⁴ This admission of Lardner’s has the more weight, because it embarrasses (as he feels) his attempts to explain the “thirty years” of our Lord’s age.



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been closed in this year. The gap in the manuscript of Dio Cassius, just at this particular part of his history, leaves it open to us to suppose that he might himself have recorded the event in this year.

when
temple of
Janus
was shut
the third
time.

Moreover this particular event, “the closing of the temple of Janus a third time”, is distinctly asserted to have occurred coincidentally with the Nativity in a well-known passage of Paulus Orosius:—“Augustus . . . cunctis gentibus unâ pace compositis, Jani portas tertio ipse tunc clausit”.³¹ It is true that he adapts this assertion to his own date of the Nativity, A.U.C. 752; but (as in the case of Epiphanius) the fact that he has produced an anachronism by so doing, is a proof that he had particular grounds for making the assertion,—is a proof, in other words, that the Nativity was in some way connected with A.U.C. 746, or B.C. 8, when the temple of Janus *was*, in all probability, closed a third time.

5. from
census in
B.C. 8;

Nothing, therefore, is wanting to the various arguments thus converging upon B.C. 8, but the production of historical evidence of the fact of a general census having been made in this year by command of Augustus; and this evidence is supplied beyond all contradiction by the Ancyran monument. For it is matter of notoriety that that marble contains the record of three censuses, executed during the reign of Augustus; the first in A.U.C. 726 (B.C. 28); the second, in the consulship of C. Marcius Censorinus, and C. Asinius Gallus, A.U.C. 746 (B.C. 8); and the third in A.U.C. 767 (A.D. 14). The second, then, of these three coincides, to a year, with the date which I have assigned to the closing of the temple of Janus the third time, and must be supposed to be the identical census spoken of by St. Luke. True, the census in question is said on the monument to be of “Roman citizens”; but then the very largeness of their number (4,233,000), as specified on the marble, proves the “citizens” meant to be, not those of Rome or even Italy in particular, but of the whole empire; and so far the monument is in harmony with St. Luke’s statement, that the census he speaks of included the whole world.³² Besides, ἀπογραφὴ, “enrolment”, the word used by St. Luke, is the term regularly used in Dio Cassius

Ancyran Monument, Tacitus Oberlini, vol. iv. app.; and Greswell, Diss i. p. 444.

³¹ Hist Lib. vi c. 22. Patrit de Evangg II.

³² Lardner, ii, ch 1.

and Dionysius of Halicarnassus, as the equivalent of "census"; and (as Lardner admits) St. Luke's narrative contains in it so many circumstances peculiar to a Roman census, that a proper census cannot but be supposed to have taken place at this time.

Once more:—To the above arguments there remains to be added the famous statement in Tertullian, that a census containing the record of our Lord's parentage was made by Sentius Saturninus:—"Sed et census constat actos sub Augusto nunc in Judæâ per Sentium Saturninum, apud quos genus ejus inquirere potuissent".³³ Cn. Sentius Saturninus was made governor of Syria in A.U.C. 744 (B.C. 10), and was succeeded in midsummer of A.U.C. 748 (B.C. 6), by P. Quintilius Varus, who governed that country down to the death of Herod, and whose appointment as governor is attested by two coins bearing his name, and stamped with the numerals xxv of the Antiochene æra of Augustus, which are identical with A.U.C. 748.³⁴ Now if Sentius Saturninus ruled in Syria no later than midsummer B.C. 6, and yet conducted the census of the Nativity,³⁵ this could not have been other than the census of B.C. 8, recorded on the Ancyran marble; and Tertullian's testimony will thus virtually coincide with that of Eusebius, Epiphanius, and Paulus Orosius, before given.

6. from Tertullian;

It may be noticed, too, as a confirmatory proof that a time of universal peace would be naturally chosen for the institution of a census, that this was actually what occurred on another occasion; for the temple of Janus was closed, as has been mentioned, by Augustus in A.U.C. 725; and the first census recorded on the Ancyran monument followed only a year afterwards, A.U.C. 726.

7. from analogy;

Finally, it is a further recommendation of the 25th of December B.C. 8, or A.U.C. 746, as the date of the Nativity of our Lord, that it is positive, whereas all others that have been proposed are negative; by which I mean, that when Patrizi, for example, determines the date of the

8. from *Apoc.* xii. 5.

³³ Tertull. adv. Marcion Lib. iv. c. 19.

³⁴ Patrit. De Evangg. Lib. iii. Diss. xviii. 16; Fr. Spanhem. (jun.), Chronol. Sacra, p. 205. As to Sentius Saturninus, if Mr. Greswell argues rightly that he did not succeed Titius, his predecessor, till A.U.C. 746 (and the evidence appealed to is a coin, Dissert. xii., p. 462), this more than ever confirms the identification of Saturninus with the census of that year.

³⁵ An argument has been attempted (Berti Dissertt. iv. 13) in proof that the "Sentius" of Tertullian is that of Tacitus, Annals ii. A.U.C. 772; but where is the census?

Nativity to be B.C. 7, what he really asserts is found on examination to be nothing more than that the Nativity could not have occurred later than B.C. 7; and the other writers the same. And I insist on this the more, because of the singular circumstance that a period of time in the Apocalypse is dated from the Nativity (*Apoc.* xii. 5, 6); which would seem to imply that the date of that event admits of being positively ascertained; and if, by universal admission, the Dionysian æra is erroneous, we are driven to B.C. 8, as the only positive substitute for that æra which the case admits of.

Sum of
the argu-
ment.

Let us now rest for a moment, and recapitulate our positions. We have started from the most accurate chronological *data* which it is possible to have,—the eclipse preceding the Passover of the death of Herod. It is not a case which can be solved by the supposition of a careless computation of the years of a king's reign, or a variation of numerals corrupted by inaccurate transcribers; but it is an argument founded on an astronomical fact, to deny which, authenticated as it is by a variety of collateral evidence, would be ridiculous scepticism.³⁶ But to prove that the Passover of A.U.C. 750, or B.C. 4, is the date of the death of Herod, is virtually to prove that the Nativity could not have taken place so late as the December of B.C. 5, compatibly with the events mentioned in the Gospels as following the Nativity. Thus we are driven to put the Nativity (if in December at all) in the December of B.C. 6, at the very latest; and besides this, there is a convergence of arguments rendering it probable in the highest degree that the actual date of that event was the December of A.U.C. 746, or B.C. 8. The “deliria Josephi”, mistakenly stigmatized by Baronius, culminate in fact in the “hallucinationes” of Eusebius and Epiphanius, ridiculed by Scaliger; and I am well satisfied that it is unnecessary to reject either, in the sense in which I have accepted the testimony of both in the foregoing pages.

But it will be objected, that we are bound to accept the latest possible date, which is the December of B.C. 6, because we are bound not to depart further than need be from the chronological *data* in St. Luke. This would be a serious argument, if it applied. But the point to which I call immediate attention, and which will suit-

³⁶ Mr. Greswell's escape (see his *Dissertations*, vol. i.) is, that all the astronomers who have computed this eclipse may have made a mistake. We are not so incredulous.

ably introduce the discussion of the remaining part of my subject, the date of the Crucifixion, is this, that neither B.C. 6, nor B.C. 5, much less B.C. 8, or the intermediate year B.C. 7, taken as the date of the Nativity, can at all be accommodated to the chronological passage in St. Luke as understood at present.

Chrono-
logy of
St. Luke
misin-
terpret-
ed.

For the chronological materials in St. Luke are simply the following:³⁷—“Now in the fifteenth year of the reign of Tiberius Cæsar, Pontius Pilate being governor of Judæa”, etc., “the word of God came unto John, the son of Zacharias, in the wilderness”. . . . “Now when all the people were being baptized, it came to pass that Jesus also being baptized, and praying, the heaven was opened”, etc., “and Jesus Himself was about beginning thirty years of age” (*καὶ αὐτὸς ἦν ὁ Ἰησοῦς ὡσεὶ ἑτῶν τριάκοντα ἀρχόμενος*). Now Augustus died, and was succeeded by Tiberius, August the 19th, A.U.C. 767, A.D. 14. Therefore, the fifteenth of Tiberius began August the 19th, A.U.C. 781, A.D. 28. If then John began to preach about the beginning of the fifteenth of Tiberius, or at the latter end of A.U.C. 781, A.D. 28, our Lord being supposed to be baptized a few months afterwards, the date of His baptism would be A.U.C. 782, A.D. 29. And if He was then “about beginning His thirtieth year”, (and such is the obvious and only intelligible sense of the Greek words) He was then terminating his twenty-ninth year, and accordingly must have been born in the December of A.U.C. 753, or B.C. 1 (the date of the Dionysian æra), that is, four or five years at the least later than He could possibly have been born compatibly with the eclipse of Herod’s death. Date His baptism, if you will (contrary to all probability), from the *beginning* of the fifteenth of Tiberius, and you may then put the Nativity in A.U.C. 752, or B.C. 2 (the date generally assigned by the Fathers). Do violence, again, both to the Greek of St. Luke and to the general consent of antiquity, by supposing that *ἀρχόμενος* can possibly signify, of itself, “beginning His ministry”; make Him, that is, to be “about thirty” at the time of His baptism, and you still cannot carry the date of the Nativity higher than B.C. 3, or A.U.C. 751, still two or three years in arrear of the latest date possible, and with all the probabilities of a date earlier than this by several years against you also.

Difficul-
ties pre-
sented
by it,

³⁷ Luke iii. 1, 2, 23.

cannot
be met
by ante-
dating
reign of
Tibe-
rius ;

By way of meeting these difficulties, the expedient was introduced of asserting that it was possible to ante-date the fifteenth of Tiberius by three years, on the score of a so-called association of Tiberius with Augustus in the government of the provinces somewhere about two years before the death of the latter. What was the first of Tiberius in the regular Roman computation might in this manner, it is said, have been reckoned as his fourth year in the provinces; and thus the Roman "fifteenth" would, in the opinion of St. Luke, be the eighteenth, and the Roman twelfth, the fifteenth. Our Lord, according to this view, would have been baptized A.D. 25, and crucified A.D. 29. And it is further defended on the ground that the early Fathers date the Crucifixion as the year of the consulship of the two Gemini, who in fact occupied the consulship A.D. 29.

for these
reasons :

But this expedient³⁸ is certainly one which never would have been adopted but in default of a better; and I may summarily set it aside in a few words.

First: it militates against St. Luke's declaration, that Pontius Pilate was governor of Judæa at the beginning of the ministry of St. John the Baptist. For Josephus says³⁹ that Pilate had spent ten years in Judæa, when Vitellius ordered him to Rome to defend himself from the accusations of the Jews before the emperor. Pilate thereupon "hastened to Rome, in obedience to the commands of Vitellius, not daring to refuse". But before he arrived at Rome, Tiberius was dead. Now Tiberius died on the 16th of March, A.D. 37. Pilate, then, "hastening to Rome", as he did, must have left Palestine at the beginning of A.D. 37, at the very latest; therefore he could not have entered on his office as governor before A.D. 27; which is two years too late for the advocates of the theory in question.

Again:—it is the strongest objection to this theory, that it is perfectly modern; none of the old ecclesiastical writers having ever imagined or countenanced such an opinion, and no monument of antiquity, whether coin, history, or inscription, being producible in support of it. Nor is it likely, in any way, that St. Luke, in so formal a statement of the chronology of St. John's ministry as he gives in his third chapter, should have em-

³⁸ See Lardner, among others, for all that can be said for it.

³⁹ Ant. xviii 5.

ployed any but the commonly received æra of Tiberius' accession.⁴⁰

Lastly: the argument from the Fathers, who date the Crucifixion at the consulship of the two Gemini, A.D. 29, is put an end to by the consideration that the same Fathers consider the ministry of our Lord to have lasted only a year and a few months. Hence, in assigning the Crucifixion to the consulship of the two Gemini, they are only virtually repeating St. Luke's assertion, that the ministry of our Lord began in that consulship. Thus Clemens Alexandrinus:—"Jesus . . . was appointed to preach only one year", which, he adds, is "the acceptable year of the Lord"; and says, that He "suffered at the age of thirty". Thus Origen:—"He taught for about the space of a year and a few months". Thus Tertullian:—"Christ suffered in the fifteenth year of Tiberius, at about the age of thirty".⁴¹ Thus Africanus:—"In the fifteenth of Tiberius". Thus Lactantius:—"In the fifteenth of Tiberius, and the consulship of the two Gemini"; as also St. Augustine and Sulpicius Severus. "All these opinions", says Petavius,⁴² who quotes these authorities, "later centuries have deservedly set aside as erroneous; for Christ certainly preached more than one year, and three Passovers at least are recognized in the Gospels". But if the early Fathers in general are in error on this point, it is impossible to quote them in favour of the opinion that the fifteenth of Tiberius may be antedated by three years, on the mere ground that they identify the consulship of the two Gemini with the date of the Crucifixion.

We have no choice, therefore, but to take the fifteenth of Tiberius in its literal meaning, and to admit that our Lord entered upon His ministry towards the close of A.U.C. 782, A.D. 29. So that the only question now to be determined is the length of that ministry; and here the consent of the Church from the time of Eusebius to the present day is so entirely in favour of its being estimated at something less than four years, that it would be superfluous to go into the arguments founded both on the Passovers referred to in the Gospels, and on the intimations given by our Lord, which justify that consent.

Thus our Lord ministered from A.D. 29 to A.D. 33.

⁴⁰ Fr. Spanhem. (jun.) Chronol. Sacra, i. p. 209.

⁴¹ Tertullian, however, is quoted by St. Jerome, at Dan. ix., as saying "thirty-three"; and elsewhere he speaks of our Lord's "being manifested in the twelfth of Tiberius".

⁴² De Doctrinâ Temporum, L. xii. c. 9.

Date of
Cruci-
fixion
therefore
A.D. 33.
Proof of
this from
the "Fri-
day";

But if so, the year of the Crucifixion would be that of A.U.C. 786, A.D. 33. Now, it is certain that the week day of the Crucifixion was Friday. This appears from *Matt.* xxxvii. 62, and *John* xix. 31; for the *parasceve*, spoken of in both these passages as the day of the Crucifixion, was the day preceding the Sabbath day.⁴³ Moreover, the month-day of the Crucifixion is also known of course: it was the day of the Passover, the fourteenth of the month Nisan. Now, by astronomical calculation it appears, that from A.D. 29, to the close of the government of Pilate in A.D. 36, there was no year (with the possible exception of A.D. 29⁴⁴ itself, which we have already rejected), in which the fourteenth of Nisan could possibly have coincided with Friday, but A.U.C. 786, A.D. 33, on the 3rd of April.

The argument just given must surely, even alone, be decisive, under the circumstances, in favour of A.D. 33, and against A.D. 29; and the ablest commentators have ever felt it to be so. "In inextricabilibus difficultatibus se implicans", says the younger Spanheim,⁴⁵ "quotquot vel veterum sententiæ de morti Christi Geminis consulibus adhærent, vel eos inter se conciliare, aut cum Scripturâ, annuntuntur".⁴⁶ I will complete, however, the evidence for A.D. 33, with three additional confirmations of it.

from the
aposto-
lical con-
stitu-
tions;

The Crucifixion, then, is virtually assigned to this year by the "Apostolical Constitutions";⁴⁷ for they speak of the day of the Crucifixion as falling in "the first month, Xanthicus", that is, April; for that day would have fallen in April, as just shown, in A.U.C. 786, A.D. 33; whereas in A.D. 29, it would have fallen in March.

from St.
Augustine;

Next, a remarkable passage in St. Augustine implies the same. He is commonly indeed quoted as expressly maintaining, like the other Fathers, that "our Lord was put

⁴³ It appears that the same word is also used to denote Friday in an edict of Augustus, preserved by Josephus:—*ἐν σάββασι, ἡ τῆ πρό ταυτῆς παρασκευῆ.*—*Ord. Sæcl.*, l.c.

⁴⁴ In A.D. 29, it might have fallen on Friday, March 18, if the 18th be not too early.

⁴⁵ *Chronol. Sacra.* i. 209. *Comp. Scaliger*, p. 562.

⁴⁶ He adds, "Quod verò huic anno æram Passionis Dominicæ fixerint inde factum videtur, 1, quòd primum annum Christi fecerint illum Incarnationis, eundemque fixerint (Iren. Tertull. Clemens Alex., etc.), ad Julianum 43, Augustei imperii 41, annis tribus ante æram Dionysianam; 2, quòd baptizatum eundem censerent, anno ætatis 30 his ineunte, illis exeunte, Jan. 6, Tiberii 15, (A.D. 28); 3, quòd duo Paschata complevisse in ministerio, seu prædicasse anno uno et aliquot mensibus plerique statuerint".

⁷ L. v. c. 14.



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to be disturbed; the Passover of Friday, April the 3rd, A.D. 33, is equally unyielding; and our chronology, like the temple of old, must accommodate those sacred limits which it cannot exterminate.

The following, then, is both the sum of my conclusions and the state of my argument. I have found the Nativity reasonably assignable to no later than the 25th of December, A.U.C. 746 (B.C. 8), and the Crucifixion to no earlier than the 3rd of April, A.U.C. 786 (A.D. 33); so that, computing from the Incarnation, nine months before the Nativity, or about the end of March, the interval from thence to the Crucifixion would be the round number complete of forty years. These conclusions, moreover, may be said to harmonize with all facts, and with all important chronological notices, whether sacred or profane, except one; that one being the statement in *St. Luke*, that our Lord was "about beginning His thirtieth year" at the time of His baptism. This particular statement I have throughout been omitting to take account of, as an element in the computation. It is indeed a difficulty and a problem which invites attention,—nay, which even seems to demand, if we may so say, a satisfactory solution; but it would be beside my purpose to enter upon it here.

My investigation shall conclude with the citation of a remarkable testimony, from one of the earliest of the Fathers, towards the general position maintained in the foregoing pages, that the length of our Lord's life altogether was forty years. I mean the famous passage relating to that subject in Irenæus,⁵² whose date is no later than A.D. 167. That Father had occasion to confute certain heretics, who, in connection with their heresy, insisted on the fact, or what they considered to be such, that our Lord was thirty years old at His baptism, and preached for exactly one year after His baptism. To this it was answered by St. Irenæus—first, that our Lord, according to St. Luke, had not completed thirty years when He came to be baptized, but was "about beginning thirty"; secondly, that He preached for more than one year; for that three Passovers are mentioned in St. John between the Baptism and the Passion; and thirdly (which is the point to be observed), that if He had suffered at the age of thirty, He would have died "young"; whereas "the Gospel, and all the elders who associated

that
from the
Incarna-
tion to
the Cru-
cifixion
are 40
years.

The 40
years
confirm-
ed by
Irenæus

⁵² Hæres. lib. ii. c. 22.

in Asia with John the disciple of the Lord, bear witness that John delivered to them this very tradition, that our Lord was teaching when He had entered on the decline of life" ("seniorem", or "provectiorem, ætatem"). By the "Gospel" St. Irenæus evidently means the passage *John* viii. 57, "Thou art not yet fifty years old"; for he goes on to refer to it as an evidence that our Lord had reached the "seniorem ætatem", having previously defined the period of "youth" to "be by general admission that from thirty to forty", and that of the decline of life to begin at "forty and fifty".⁵³ The whole passage is most remarkable, and has always been a source of the greatest perplexity to Catholic commentators, whilst it has been triumphantly held up as a monument of the worthlessness of anything professing to be a tradition, by others. With St. Irenæus' own inference that our Lord was "not far from fifty years of age", when the Jews addressed Him the question in *John* viii. 57, I am not concerned, although I think his general conclusion, that a person who was the subject of such a remark was nearer forty than thirty, quite legitimate. The important part of the passage is the positiveness with which he asserts the tradition that our Lord had reached the "seniorem ætatem" before He suffered. Nor can it be said that St. Irenæus was ignorant of the facts of the Gospel history; for he is aware of three Passovers having followed our Lord's baptism, and is even in advance of some of the Fathers who succeeded him in order of time, in possessing this knowledge. Hence his record of the tradition in question has the greater value; and I may reasonably appeal to it as a very strong confirmation of the conclusion I have already arrived at on other grounds, that the period from the Incarnation to the Crucifixion was forty years; forty being the age from which St. Irenæus himself proposes to date the "seniorem ætatem" spoken of by the tradition.

Note.—The writer of the foregoing lucid article has thought it best, as being engaged in an investigation of a chronological, not a theological nature, to omit any consideration of the difficulty resulting to his argument from a fact, to which he calls attention at starting as being the

⁵³ "A quadragesimo autem et quinquagesimo anno declinat jam in ætatem seniorem; quam habens Dominus noster docebat", etc.

basis of the Vulgar Æra, viz., the date assigned in the Gospel of St. Luke to the commencement of our Lord's ministry. If he was thirty years old when Tiberius was in his fifteenth of Empire, he must have been born B.C. 1, as Dionysius concluded, whereas in the foregoing Dissertation his birth is placed in B.C. 8, seven years earlier. From this it follows, that he must have begun his ministry either in the eighth, not the fifteenth, of Tiberius, or at the age, not of thirty, but of thirty-seven; or again, that both these dates in the Evangelist must be changed, *e.g.*, that he began his ministry in the twelfth of Tiberius, at the age of thirty-three.

Here, then, we draw attention to the author's remark, that the difficulty in question is not peculiar to his own conclusion, but is shared with him by writers of great name. If St. Luke says that our Lord was "about thirty" at the commencement of his ministry, this surely can as little mean thirty-five, or thirty-four, or even thirty-two, as it can mean thirty-seven; and, if the Evangelist's statement can be proved to be consistent with the historical fact that our Lord was (for instance) thirty-five, we really do not see why it may not, by the same process of argument, whatever it is, be proved consistent with his having been thirty-seven. Certainly, there is no reasonableness in acquiescing in thirty-five, merely because we are used to it, and to scruple at thirty-seven, because the idea is new to us. Yet Sanclemente (to which Father Perrone appeals), and Father Patrizi, both consider our Lord to have been thirty-two, Magnan thirty-four, and the Maurists thirty-five.

It may be said that the words *τρίακοντα*, etc., are undeniably vague; but the question is, what that vagueness must be taken to imply when it is found in an inspired document. The expression "about thirty" may mean one of two things; viz., either the writer's own *uncertainty* of the fact of our Lord's exact age, or his judgment that the excess or defect was so *inconsiderable*, that it was not worth his noticing it. It evidently would be beside his purpose to notice months or days on this side or that of thirty years, or any fragment of a year. Now, the former supposition, that he was *ignorant* of our Lord's age, is inconsistent with his being inspired on the point; so we put that alternative aside. But if we adopt the latter supposition, which is consistent with inspiration, viz., that the excess or defect was *inconsiderable*, then the word "about"

cannot stretch so far as a year on either side of thirty, and thirty-one and a half is as inconsistent with it as thirty-five.

For instance, if a writer who knew our Lord's age was thirty-five, called him "about thirty", he might just as well call him "about forty"; yet would not a second writer, who did so call him, be considered to contradict the first, who called him "about thirty"? If it be said that "about thirty" means "thirty and more", and that it was not uncommon to reckon by decades (and this may be said), such an explanation covers thirty-seven, as well as thirty-five or thirty-two.

We consider, then, that the author is in no difficulty which is not shared with him by great critics. If, however, under such circumstances we are bound to give any positive explanation of it ourselves, we should avail ourselves of the supposition which has been made that there were *two* fifteenths of Tiberius, Augustus having certainly associated him in Tribunitian and Proconsular power several years before his death (vid. Petav. Doctr. Temp., t. 2, p. 301; Nat. Alex., t. 3, p. 76, Ed. 1730; Pag. ad Baron., t. 1. p. 69). This supposition, which Dean Alford, in Luc. iii. 1, says, "has usually been adopted", has been sometimes rejected on the ground of its being gratuitous. Let us allow there is no historical record of such an act; yet such suppositions are of constant use among controversialists in order to turn insurmountable difficulties. For instance, will any one deny that the writer of the foregoing article fairly maintains that the infant Saviour was in Bethlehem for a second time the next year after his birth? yet he does so without any historical evidence, and simply on the necessity of his own arrangement of dates. And he assigns an hypothetical motive to account for the hypothetical fact, viz., his parents were probably induced to return to the city by pious persons, etc.; and this surely is allowable logic. But, if it is not illogical to introduce this pure conjecture, by way of harmonizing the Evangelists, we do not see why it is illogical to imagine such an association of Tiberius in his predecessor's power, as would virtually be an accession to the Empire, a proceeding which was both recommended by an evident expedience, and conformable with the practice of hereditary rule elsewhere, and of the Roman Empire itself in a subsequent age. Nor are the reasons which are alleged in opposition to the hypothesis itself,

of a nature so cogent as to outweigh its convenience under the circumstances.

By this expedient we gain three or four years; then, moreover, it must be recollected that the Roman year and St. Luke's need not begin together; and a further latitude is gained by understanding ἀρχόμενος, not as connected with τριάκοντα, but in the sense of "at first", as it is used in the classics, and as τελευτῶντες is used for "at last". Ἀρχόμενος and εἰς τέλος are contrasted in Job. vi. 9, vid. also Jud. xix. 6. The ellipsis of the genitive is supplied by Euthemius, vid. Alford *in loc.*, vid. also ἐπισκοπῆς in a parallel case in Vit. Pachom. ap. Bolland. May 14, append. p. 30. On this interpretation, ἀρχόμενος and τριάκοντα will express correlative ideas, thirty being the legal age for undertaking great ministries.



ART. III.—*Seyffarth and Uhleman on Egyptian Hieroglyphics.*—By P. LE P. RENOUF.

Cham-
pollion

IT is now about forty years since Young and Champollion first convinced the learned world that the task of deciphering Egyptian hieroglyphics was not so hopeless as previous attempts had generally led one to suppose. Whatever may have been the merit of Dr. Young, with reference to the first discovery, it is undoubtedly to Champollion alone that the science of Egyptology is indebted for the rapid progress it soon made, and of which no one can form a just notion, who looks simply at the results, without calculating the number and greatness of the difficulties to be overcome. In a very few years he had not only determined the alphabetical and ideographical values of several hundred hieroglyphic signs, the accurate meaning of the most frequent groups, and the general sense at least of a vast number of inscriptions, bearing upon every branch of Egyptian antiquities, but was able to leave behind him a grammar and a dictionary¹ of the

¹ Dr. Seyffarth allows about a thousand words in the dictionary to have been rightly interpreted. It is a pity that he has not given a list of them, for the concession might turn out to be even more important than was intended.

Egyptian language, both of which, however imperfect when compared with grammars and dictionaries of well-known languages, must, under the circumstances, be ranked among the most remarkable prodigies which human genius has ever accomplished.

Of all Champollion's rivals and opponents, Dr. Seyffarth and his opponents. is the only one whose theories have contrived, under one form or another, to live down to the present day. The theories of Spohn, Klaproth, Goulianof, Riccardi, Jannelli, and others, are forgotten, or at least have ceased to occupy the attention of those who seriously intend to make themselves acquainted with the language, the literature, or the history of ancient Egypt. And it is now as absurd to speculate upon the possibility or impossibility of reading hieroglyphic inscriptions, as upon the possibility or impossibility of reading Arabic or Sanscrit. Any one who will give himself the trouble, may learn in a very short time to verify the names found in the catalogues of the British Museum, the Louvre, or any other great collection of Egyptian monuments. And an alphabet derived from proper names alone will enable one to read whole sentences, perfectly intelligible to a Coptic scholar.

According to some very high authorities on the subject, it would be extremely unjust to deny that Dr. Seyffarth Dr. Seyffarth; his restoration of the Turin Papyrus; has rendered great service to the students of Egyptian antiquity. It is to his labours² that we are indebted for the present arrangement of the royal Turin Papyrus, one of the most invaluable historical documents in existence, which before his time lay broken, like a child's puzzle, in a number of disconnected fragments. His systems of interpretation³ his systems of have not met with much success, and this is

² See Lepsius, "Ueber die zwölfte ägyptische Königsdynastie," p. 16, sq., and Sir G. Wilkinson, "Fragments of the hieratic papyrus at Turin". See also Bunsen's Egypt, Vol. i. p. 52, etc. I am sorry to say that authorities are not unanimous as to Dr. Seyffarth's services. Mr. Birch believes a mere mechanical restoration of the papyrus impossible (Transactions of the Royal Society of Lit., i. 203, sq.), and M. de Rougé, who has seen the document, declares it to have been "sophistiqué avec une habileté déplorable". Revue Arch. 1850, p. 559, sq. See also some letters of M. Champollion-Figeac in the same volume of the Revue Archéologique. If it be true that Dr. S. has been guided in his restoration by the lists of Manetho, nothing short of a miracle can have prevented his going wrong.

³ His most important productions are :

De Hieroglyphica Aegyptiorum scriptura. Lips. (1825).

His edition of Spohn, de lingua et literis vett. Ægyptiorum, 1825-31.

Rudimenta Hieroglyphices, 1826.

Bemerkungen über die Berliner Papyrus, 1826.

interpretation; not surprising on the part of the public, when it is remembered that the author himself has, on more than one occasion, discovered the untenableness of his position, and abandoned one system after another. If it be true, that after many years of unwearied labours, in which he has not only put forth his own views, and asserted his claim to have first discovered the true key of hieroglyphic interpretation, but elaborately criticised the labours of Lepsius, and all the other principal followers of Champollion, Dr. Seyffarth has at length retired from the contest and abandoned the subject of Egyptology altogether, it would seem unchivalrous in the extreme to come forward against him now, particularly as it is notorious that he was always challenging the discussion of his claims. A most zealous champion of Dr. Seyffarth has, however, of late years appeared in the field, and I should not be surprised if he met with a considerable amount of success; not indeed with persons who have paid much attention to hieroglyphics, but with that very large class of persons who, from want of time, inclination, or capacity, are indisposed to study the subject themselves, but are anxious at least for *results*.

his disciple,
Dr. Uhle-
man.

Dr. Seyffarth and his disciple, Dr. Uhleman,⁴ profess to give far more brilliant results than their rivals. Bunsen rather imprudently said that no living man was capable of translating a page of the "Todtenbuch". Dr. Seyffarth and his disciple translate whole chapters. Lepsius says there are inscriptions of which as yet we understand

Beiträge zur Kenntniss der Litteratur, Kunst, Mythologie und Geschichte des alten Aegypten, 1833-40.

These "Beiträge" contain, among other essays,

Systema Astronomiæ Aegyptiacæ.

Alphabeta genuina Aegyptiorum, etc.

Grammatica Aegyptiaca, etc., mit 92 Seiten Lithographien. Gotha, 1852. [The lithographed plates had been in private circulation about ten years before.]

Theologische Schriften der alten Aegypten. Gotha, 1855.

⁴ De linguâ et litteris veterum Aegyptiorum. Berlin, 1851.

Das *Quousque tandem?* der Champollion'sche Schule. 1852.

Quæ, qualia, quanta! 1852.

Inscriptionis Rosettanæ Hieroglyphicæ Decretum sacerdotale. Lips. 1853.

Philologus Aegyptiacus. 1853.

Das Todtengericht bei den alten Aegyptern. Berlin, 1854.

Thoth oder die Wissenschaften der alten Aegypten. Götting. 1855.

Drei Tage in Memphis. 1856.

Grundzügen der Astronomie und Astrologie der Alten, besonders der Aegypter. Lips. 1857.

Also several articles in the "Zeitschrift der deutschen morgenländischen Gesellschaft", and the "Leipziger Repertorium".



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soon as Dr. Seyffarth should find a single disciple in Germany or any other country. Almost immediately after this Dr. Uhleman appeared as a disciple of Seyffarth, yet the pledge which had been solemnly and publicly given had never been redeemed.⁷

I have not the mission to fight the battles of Dr. Lepsius (who is quite strong enough to defend himself), or even to interpret his words; but even though the event had shown, in this case, as in so many others, how greatly "human wisdom errs", I do not think it yet clear that human wisdom could have spoken more wisely or to the point than it did in the reply of Lepsius to the challenge of Seyffarth. It is easy for learned classical or oriental scholars to believe in the translations of Seyffarth and Uhleman, and in the conclusions which necessarily result from those translations; but let them only try (for a day or two) to acquire some knowledge of the Egyptian tongue according to Dr. Seyffarth's method of deciphering texts, and they will speedily understand how difficult it was to foresee that any disciple of that system was likely to appear in Germany or in any other country. The fundamental objection to that system consists in the apparent impossibility of learning or teaching it. Dr. Uhleman professes to have got over one half of the difficulty, but he gives very good reasons for not encountering the other.

According to Dr. Seyffarth, the test of a true "key" lies in its enabling us to decipher and interpret whole texts of different kinds. It is by this that he judges his own system and that of his opponents. Except under certain limits, however, his test is a very unsafe one.⁸ Even when a true key is found, it does not follow that every one is able to use it at once. It may be a very complicated instrument; and a false key, on the other

⁷ "Bald darauf hat ein anderer 'Schüler' Uhleman dasselbe System selbstständig angenommen, gelehrt und fortgebildet; aber Hr. L. hat bis heute, nach vollen 7 Jahren, sein öffentlich und feierlichst gegebenes Versprechen noch nicht erfüllt". *Grammatica Ægyptiaca*, p. xiv.

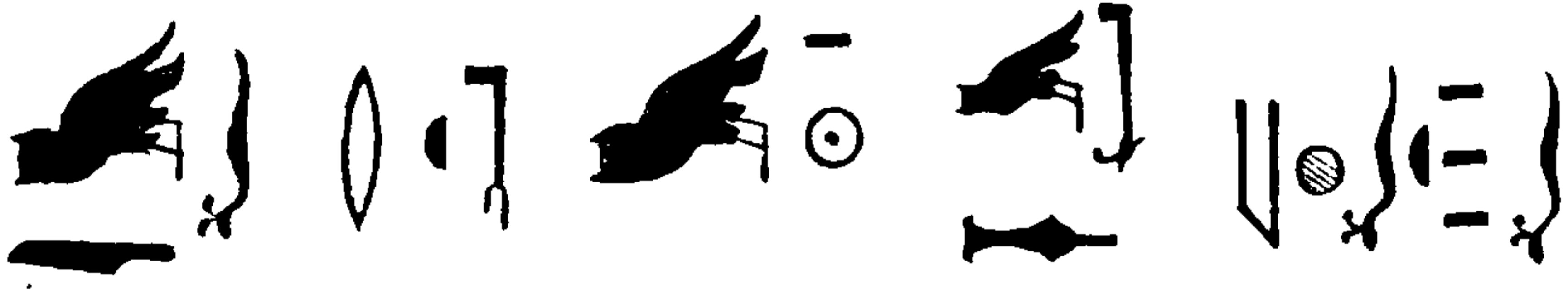
⁸ In one passage (*Gramm. Ægypt.*, p. xxxv.), Dr. Seyffarth seems to give a more severe test "Der Inductionsbeweis für die Richtigkeit eines hieroglyphischen Systems ist, wenn man demselben gemäss fortlaufende Texte logisch übersetzen kann. Wer ganze Inschriften entziffert, und indem er überall demselben Schriftzeichen dieselben Laute zuschreibt, denselben Gruppen dieselbe Bedeutung beilegt, dieselbe Sprache und Grammatik zu grunde legt, dieselben Grundsätze befolgt, einen logischen Zusammenhang erhält, der muss den Schlüssel zu solchen Inschriften gefunden haben". Is the loophole in the plural "denselben Gruppen"?

and its worth.

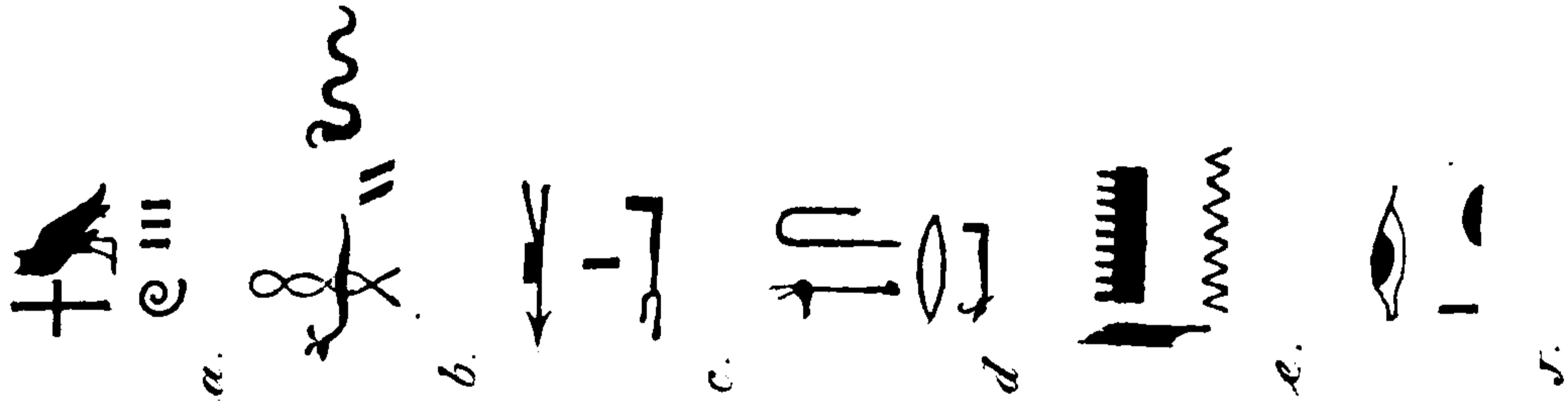
Dr. Seyffarth's test of a true key.

PL. I.

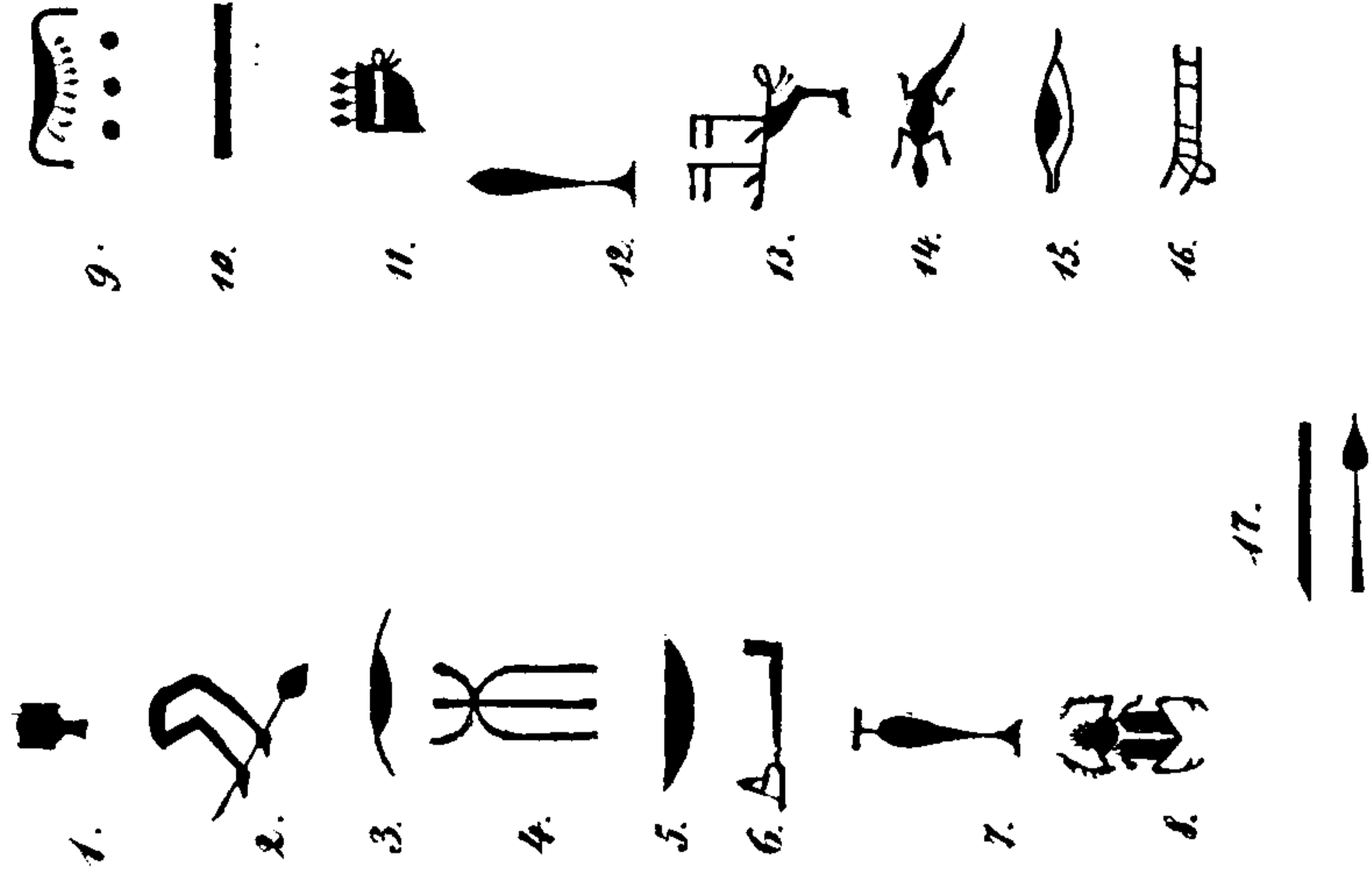
A.



B.



C.



hand, may satisfy the test Dr. Seyffarth has chosen.⁹ It is easy enough to invent a key which will enable us to explain not only hieroglyphic but cuneiform and every other kind of writing. We have only to attribute to *each* character the values of the *principal* consonants, that is, only about half a dozen sounds; and with this key it is not difficult to make out the Ten Commandments, the Psalms of David, the Homeric Poems, or the Irish Melodies, on any ancient or modern monument whatever, and in any language you please. The awkward thing about this kind of "key" is, that, although by its aid you can decipher and interpret whole texts, you cannot teach other persons to arrive *independently* at the same results as yourself; and this difficulty or rather impossibility is in fact a test by which the key in question is proved to be simply worthless. It is the test which Lepsius, rightly or wrongly, applied to Seyffarth's system. It is not yet certain that the system has stood the test. We have no proof as yet that Dr. Seyffarth and Dr. Uhleman could, without communicating together, give the same reading and interpretation of an Egyptian text which they had never seen before.

A counter-test applied to his system, viz., the Possibility,

Let us, however, come more closely to the point. Every one, says Dr. Seyffarth,¹⁰ may convince himself. Let him take any text, consider none of the characters as symbolical, but attach to each the syllabic or alphabetic value laid down in the new grammar, and observe the appropriate grammatical rules and forms; he will then see how naturally and simply a rational sense will be the result.

Let us then take the first line¹¹ of Dr. Seyffarth's fifth hieroglyphic text in the chrestomathy attached to his grammar. It does not much matter which we select; but since the Chrestomathy was printed, Dr. Seyffarth has changed his views in some respects. It is important therefore to know that we are not criticising something which has already been given up. The line in question, which consists of seventeen hieroglyphic signs, forming five groups (each of which is a word), is translated thus:

Oratio de magistratu regis supprimente pravos.

⁹ "Ein System welches zweisprachige Inschriften richtig übersetzt kann doch unmöglich einen falschen Schlüssel enthalten".—Gramm. Ægypt, ib. If this be true, Mr. Osburn's system is as infallibly correct as that of Dr. Seyffarth, and so is that of the schoolboy who translates *arma*, I sing; *virum*, the arms; *que*, and; *cano*, the hero.

¹⁰ Gramm. Ægypt, p. vii.

¹¹ See Plate I. (A) of this article.

In Dr. Uhleman's last volume, just published, I find it thus translated: "Rede von der Obrigkeit des Königs, welche züchtigt die Wiedersacher desselben". The two translations agree perfectly, except in one particular, where the German may be considered as the correction of the Latin.

with his
alpha-
bet,

If we now refer to Dr. Seyffarth's hieroglyphic alphabet, and the commentary upon it, with reference to each of the signs, we shall find that:

No.	1	=	the sounds	a, e, s, es.
"	2	"	"	m, hm, ml, mr, mlk, mlh
"	3	"	"	hop, op, o, p, f.
"	4	"	"	hr, kr, h, k.
"	5	"	"	t, tb, tp, tu.
"	6	"	"	am, a, m, mh, k, b, kb,
"	7	(same as No. 2.)		
"	8	=	the sounds	our, r.
"	9	"	"	hpt, kpt, pt, k, hm.
"	10	(same as in No. 2.)		
"	11	=	the sounds	ht, t, ash, sh.
"	12	"	"	mt, m.
"	13	"	"	k, kb, kp, b, bk
"	14	(same as No. 3).		
"	15	(same as No. 5).		
"	16	(the usual sign of the plural <i>oui</i>).		
"	17	(the same as in Nos. 3 and 14).		

To these we ought perhaps to add another sign. The stroke which follows the solar disk (No. 8) is not phonetic according to Champollion's school; but it is difficult to say whether it is so or not according to the rival system as now defended. According to Seyffarth's grammar, it had sometimes the sound of *pt*, sometimes that of *a*. Uhleman, in his alphabet, ascribes to it the sounds *ut*, *t*, but in his interpretation of the Rosetta Inscription¹² has frequently treated it as a mere expletive. This difficulty however is but insignificant, when compared with another, which really seems to be fatal to the entire system.

of arriv-
ing at
onefixed,
definite

As each hieroglyphic character represents, not one sound, but several, every combination of characters necessarily represents several (and sometimes many) combina-

¹² *E.g.*, in the words Hpt, line ix. 4 (compare xi. 41); R., ix. 40; Pn, ix. 67; Km, x. 62; S, xi. 52; Hr., xii. 8. The last reference here given is the very group in our text, viz., the solar disk and the stroke.

tions of sounds. It is impossible to write a word of two or three syllables, without leaving it doubtful whether some other word be not intended. How is the reader to find out which word is meant? Is he obliged to draw up an exhaustive catalogue of all the possible combinations of sounds which the characters admit of, eliminating those which express no rational notion? But after this elimination, several words may still remain differing widely in sound and meaning.

Let us take, for instance, the first group (consisting of the characters No. 1, 2, and 3) of our text. I am really afraid to calculate how many combinations of sounds it may be made to represent. We may, if we please, read *amo, emo, semo, smo, esmo*; then each of these words with a *p* at the end, or fresh series of words of a different type, as *semlef, ahmehop, amelkep, esemref*, etc. The exact computation of the number of words which might be made out of our three hieroglyphic signs, may have some interest as an arithmetical exercise, but few persons would indulge their taste for reading a language where this process had to be gone through for every successive word. It would be no consolation to know that most of the words are void of sense, and therefore cannot be the one intended. In learning to read the language, we ought already to have the dictionary by heart. And the difficulty holds for every word of the dictionary itself.

In utter despair, therefore, of determining for myself the first group by the help of Dr. Seyffarth's alphabet, and, as the same difficulty applies in a greater or less degree to every successive group, I look at his interpretation of the whole line, and it is not without astonishment that I read:—

Hro n'-alēi (Eloah) m'-ouro g'om m'-shaftou.

Dr. Uhleman has evidently read *shaftou-f*, but as his translation agrees in all other respects with that of his master, it is clear that he has read the text in the same way; or is it part of the new system, that the same sense may be gathered out of widely different readings?¹³ Will

¹³ Dr. U. defends his master's translations in several cases where he differs from him in the reading or in the etymology. He also occasionally condescends to use the translations of the "Champollianer". He translates, for instance, "Ar rech re pen" (a formula which often occurs in the Ritual) like M. de Rougé, though he reads the two first words "er-arez". He translates the first group of each clause in the

Dr. Uhleman, or any one else, explain how the first two groups come to express "*Hro `n-alēi*"?

Until this explanation be given, it may be interesting to observe how, in other passages, Dr. Seyffarth has interpreted *the very same groups*.

and
must be
read in
a variety
of ways,

The first group (in full or in its elements) occurs often enough in the hieroglyphic texts of his Chrestomathy. It is interpreted *emio* "multum", x. 78, *emio* "macte", viii. 16, 22, *emof* "ei qui non", v. 51, *emef* "nemo", iv. 77. A group consisting of the two first characters, is interpreted *emi* "intelligens", ii. 23, *emi* "sapientia", ii. 30, 47, etc. What prevents our reading (for our first group) *emif* "sapientia ejus", or (for the two first groups) *emi `n-alei* "sapientia de magistratu".

and
widely
different
transla-
tions

The *second* group, which occurs very frequently indeed in the Chrestomathy, is interpreted *ret* "plantatore", ii. 2, *reti* "pariter", i. 107, "similes", iv. 50, "uti", v. 37, *hraam*, "canentis", vi. 5. Why should one passage be translated "Oratio de magistratu", and another "Oratio de plantatore", when the *second* group is the same in both? Or what prevents our translating the three first groups "Oratio de plantatore" (or creatore) Solis,¹⁴ or, by another combination, "The Wisdom of the Royal Psalmist", *emi `n-hraam `m-ouro*?

By a curious coincidence, our two first groups come together in the very last line of the fourth text. They are there interpreted *emef reti*, "nemo similis est". Why should they be read in a totally different way in the very next line? Why not read *emef reti `m-ouro* "nemo similis est regi"?

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The third group, Dr. S. reads, *`m-ouro*, but instead of *ouro* (a king), he elsewhere reads *re* (the sun), vi. 158, 164, etc. If we substitute this latter reading, we obtain a new sense for the entire line.

Nemo similis est Soli supprimenti pravos (or inimicos ejus).

I shall say nothing about the fourth group, because the first character in it is one about which Uhleman follows Champollion rather than Seyffarth; but why do the cha-

Negative Confession of the dead, "Ich habe mich wohl gehütet", although he reads "*hate-nei*" where others read a simple negation. A good many examples of this kind might be given.

¹⁴ Dr. Uhleman, in the sixth chapter of the Todtenbuch, translates the word "Creator", with the following note, "Properly *Ret* plantator, as the Creator is often compared to a gardener, and the created world to a garden". Handbuch, iv. 172.



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cally" (Seyffarth, Rud. Hier., p. 23). Thus the *Bull* signifies *k* in the word Necho, *r* in Cæsar, *t* in Tor, because it had three names—*kalouki*, *eleph*, *tauro*. Champollion thought each character had but one name, as in the Hebrew alphabet, and for this very reason he was unable to read entire texts".²¹

In the passage of the Rudiments to which he refers, the same notion (which is every where put forward as a necessary consequence and characteristic of the system in opposition to that of Champollion) is expressed in still stronger terms. "*Nullum est signum hieroglyphicum, quod habeat unam tantum modo potestatem; neque pauca exstant quibus sex pluresve literæ significantur*". In the year 1855 the author considered this rather too strong, and, in fact, only half true. But in 1857 Dr. Uhleman certainly falls short of the truth when he says: "It is objected to Seyffarth that he has attributed more than one *syllabic* value to *some few* hieroglyphs".²² It would be more correct to say: It is objected to Seyffarth that he has attributed so many values, alphabetic or syllabic, to most hieroglyphs, that a text consisting of fifty groups may be read in several hundred ways. If in 1858 "*nullum unam*" or "*neque pauca*" have come to mean exactly the reverse of what they once meant, I can only say that Dr. Seyffarth's "key" is a marvellous instrument if it has retained its identity amid so much change.

Rules
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culty.

It would be unfair not to observe that Dr. Seyffarth has some consciousness of the difficulty of deciphering according to his alphabet. He thinks, however, that the difficulty may be got over by the observation of certain rules or expedients.

1. *Every word, he says, was almost always written with the same signs.*

A more rational rule would have been, that the same combination of signs should express the same word. But here, as elsewhere, Dr. S. protests against such a rule.

²¹ Gramm. Aegypt., p. 9. Is it from *eleph* that the *r* in Cæsar is derived?

²² "Es wird Seyffarth zum Vorwurfe gemacht, dass er *einigen wenigen* Hieroglyphen mehrere verschiedene Sylbenwerthe beigelegt habe. Diese Erscheinung ist jedoch eine nothwendige Folge seines mehrfach angeführten Hauptgrundsatzes". Uhleman, Handbuch I. 212. As late as 1855, Dr. Seyffarth writes (Gram. Ægypt. p. 32), "*Im Allgemeinen ist zu bemerken dass viele Bilder verschiedene Laute ausdrückten, weil sie verschiedene Namen führten*". It is to be noted that the Coptic vocabulary is rich in synonyms. Dr. U. for his own part adopts the "Hauptgrundsatz", but gives up the "nothwendige Folge".

“Glaube man nicht dass dieselbe Hieroglyphengruppe überall dasselbe Wort ausdrücke”. Is his own rule true? He adds, as a qualification to it—“Doch giebt es ausnahmen genug”. There were exceptions *enough* to it. And from another passage of the grammar, it appears that the exceptions were *numberless*! The real truth is, that, as the Egyptians had more than a thousand characters in their alphabet, and loved variety, they were in the constant habit of writing the same word in a multitude of ways. In sepulchral inscriptions, for instance, the same proper name will often be found written differently on the architrave, on the columns, and on the walls of the same tomb. Even the names of the same sovereign or of the same divinity are written variously in the royal rings.²³ In the ruins of Karnac alone, M. Prisse found twenty different ways of writing the prænomen of Thuthmes III. A collation of the numerous papyrus manuscripts, containing the ritual of the dead, has proved an immense number of readings of the same word. And this collation is, in fact, one of the most precious instruments for discovering the values of hieroglyphic characters. By comparing two readings of the same word we obtain an equation, from which we often find the phonetic equivalents of known signs. The greatest prudence, however, is required in the operation. It is not always certain that the same *word* is written in different renderings of the same text, or in renderings of the same idea. Thus “Rekah uer”, the great fire, is found as the equivalent of “Rekah naa”;²⁴ *uer* and *naa* both signifying *great*. The texts, again, are not always free from orthographical faults. Dr. Hincks has noted and discussed a number of these errors. Those of the Turin ritual, in particular, have been pointed out by Lepsius, its editor. Out of fourteen different ways, which M. de Rougé cites, of writing the word “T'ena” (to repulse), and he gives us to understand that there are more, that excellent critic rejects four as resulting from the errors of copyists.²⁵

²³ Thus the *k* in the name of Neko is sometimes expressed by the Bull, sometimes by the two Arms. Two shields of Nectanebo, bearing the same name, have but little outward resemblance.

²⁴ De Rougé *Inscription sur le tombeau d'Ahmes*, p. 97. Lepsius, *Chronologie*, p. 138.

²⁵ *Ib.* p. 155. “Voici quelques unes des nombreuses formes de ce mot, employées indifféremment aux mêmes passages du Rituel par les nombreux exemplaires que j'ai consultés”. See Champollion's *Dictionnaire Egyptien*, p. 130, sqq., for the numerous ways of writing the word “Autokrator”.

This is a strange commentary on the rule of Dr. Seyffarth; but a more a strange thing is, that few persons are better acquainted with the truth of the commentary than the author of the rule. No one perhaps is so learned in the various readings of the same word in the ritual of the dead; and it is doubtless from his frequently identifying words, which ought not to be identified, that many, if not most, of his numerous errors have arisen.²⁶

2. *To express an idea, signs cognate to that idea were chosen in preference to others.* Thus, a whip (BK), was used to spell *Bok*, a prince, but not *Baki*, a city.

To this rule, too, we might say "there are exceptions enough"; and any one who will take the trouble to verify its truth by the texts interpreted by Dr. Seyffarth or Dr. Uhleman, will probably find the exceptions more numerous than the instances.

There is, of course, *some* truth in the rule, because a large number of hieroglyphs is ideographic and even mimetic. But Dr. Seyffarth utterly disbelieves the existence of such ideographic signs. "Keine Hieroglyphe . . . hat eine symbolische Bedeutung, drückt niemals mimetisch, tropisch oder äniigmatisch einen Begriff aus".

3. *The syllabic signs were distinguished from the acrophonic by the presence of the sign Mountain (Semicircle), which discharged a function similar to that of the Dagesh forte, in Hebrew.*

This is announced as a discovery of the year 1843; but I cannot find out what use has been made of it in Dr. Seyffarth's interpretations subsequent to that period. He certainly does attach syllabic values to signs accompanied by the "Mountain", but only when it suits his purpose, and signs which are not accompanied by the Mountain come

²⁶ Boten viele Papyrusrollen mit gleichen Texten ein vortreffliches Hilfsmittel, weil sie an unzähligen Stellen dieselben Buchstaben und Sylben gleicher Wörter, wie bei den Eigennamen, durch andere gleichlautende Zeichen ausdrücken, oder Sylbenzeichen in Buchstaben auflösen". Gramm. Ægypt. p 31. He then gives five ways of writing the word Bök. Compare p. xxix. "Findet man, dass, wenn 10 verschiedene Abschriften der altägyptischen heiligen Schriften, wie der Verfasser gethan, mit einander Buchstabe für Buchstabe verglichen werden, die verschiedensten Zeichen mit einander wechseln. Allein der Verfasser wusste damals noch nicht, dass den einzelnen Wörtern ganz verschiedenen Determinative beigelegt werden konnten, welche akrophonisch verschieden lauteten, und dass die Abschreiber häufig andere synonyme Wörter in den Text gebracht hatten". Mr. Birch says of the Rituals, "they were rapidly copied, and are full of blunders". Dr. Hincks (Trans. of R.I.A., xxi., p. 177 sq.) goes so far as to deny the use of collating them in order to find out the values of unknown signs.

off just as well. The passage, for instance, from the "Todtenbuch", given in our second plate, contains that important sign but once; yet Dr. S. has not confined his syllabic interpretations to the group in which it occurs. In his interpretation of the Rosetta Inscription, Dr. Uhleman has but once or twice had recourse to this "diacritical" use of the "Mountain", and that simply when he did not know what else to do with it. And his diacritical use of it is different from that of Dr. Seyffarth.

4. *Diacritical signs and determinatives were attached to ambiguous words.*

Dr. Seyffarth's determinatives correspond to those of the orthodox school, but differ from them in being phonetic. His phonetic "diacritica" correspond in many cases to what we call phonetic duplicates or complements. The Egyptians often added to certain signs others whose sound was already contained in the former. Thus, the Hatchet (Neter) is often followed by *t*, *r*; the Beetle (Cheper), by *ch*, *p*, *r*, see note 43; the Crux Ansata (Anch), by *n*, *ch*. But this was certainly not done for the purpose of avoiding the ambiguity supposed by Dr. Seyffarth. Each sign has but *one* set of duplicates or complements, and whether the complements be expressed or no, the value of the sign remains invariable. What can be less ambiguous than the Hatchet? It has but one sound and one meaning, *Neter*, Divine. The Crux Ansata always expresses *Anch*, τὸ ζῆν, either as substantive or verb.

Besides this kind of complement, Dr. Uhleman, like his master, admits another with a negative power. The "Quiver", he thinks, had the sounds of K and K L, but when the mouth (R, L) is added to it, instead of determining the former sign as K L, the second sign subtracts its own value from the former, and determines the group as *Kō*, ponere.²⁷ But no rule has been given for distinguishing between the positive and negative complements. Nor is it easy to know whether the signs in question are to be looked upon as diacritical or not. The very group which Dr. Uhleman reads *ko*, in the ninth line of the Rosetta Inscription, is read by him *ke-ehrai*, in the tenth.

Such are the rules or expedients intended to facilitate the reading of hieroglyphic texts. Whatever truth or

²⁷ In the same way the Beetle expresses *tr* in Dr. Seyffarth's alphabet; but when *r* is added, the two signs together only express the letter *t*.

but the difficulty remains unchanged.

falsehood there may be in them, it is certain that they do not enable us to overcome the difficulty they are supposed to meet. They do not help us to determine whether a given group should be read *reti*, *alēi*, or *hraam*. They do not enable us to discover whether we ought to read *keb* or *hamkohi*, *ko* or *ke-ehrai*.²⁸ Dr. Uhleman is perhaps in possession of some other secret in virtue of which he can tell whether a well-known group of five signs is to be read *hru* (a day) or *al-ur* (the illustrious king).²⁸

We now come to the second part of our subject.

The system considerably if not essentially modified by Dr. Uhleman.

In spite of his chivalrous ardour for the glory of his master, Dr. Uhleman has very considerably modified the system he defends. On many essential points he differs altogether from Seyffarth. The extreme luxuriance, for instance, of alphabetic and syllabic values, has greatly diminished under the hands of Dr. Uhleman. Instead of hunting in Hebrew and Chaldaic for the old Egyptian names of hieroglyphs, he confines himself in general to Coptic roots; and he tells us that, instead of admitting a variety of syllabic values, he fixes, in most cases, upon *one*. This is perhaps the most important point of all. But what both Seyffarth and Uhleman are most jealous of is the *syllabic* principle, which they consider as the distinctive mark of their system. Every admission of the syllabic principle is looked upon by them as a concession on the part of their opponents. They constantly assert that Lepsius, Birch, de Rougé, Brugsch, and others have abandoned the system of Champollion, and dishonestly availed themselves of Seyffarth's *key*, without giving him the glory of its invention. Accusations of plagiarism with reference to individual signs, are not wanting; but even if these could be got over, Dr. Uhleman absolutely denies that any one calling himself a follower of Champollion has the right of using the syllabic interpretation on any single occasion.

Charges of dishonesty and of apostacy against the followers of Champollion.

In reply to assertions of this kind, which have been frequently repeated of late years, and sometimes in rather indecent language,²⁹ I beg to offer the following observations:—

²⁸ Pl. 1. g. Compare Uhleman Inscript. Rosett. p. 143 and p. 166.

²⁹ "Ob jemand laut zu Champollions Anhang sich bekenne und auf Seyffarth schelte—wofern er der Hieroglyphe den Werth mehrerer Hieroglyphen beimisst, so wandelt er auf der von Seyffarth gebahnten Strasse, und lügt mit seinem Munde". This agreeable passage is quoted by Uhleman. Handbuch, I. 211.



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De Rougé. 1851.	Seyffarth.	
	1845.	1855.
1 Her kr, hr kr, hr, k, h, ht, hpt. . .
2 Chen kht, hm kt, ht, k. . .
3 Aah . . .	. hr, h . . .	. kr. . .
4 Mes . . .	. ms, sm . . .	. m, ms. . .
5 Nev. . .	. shsh . . .	. n, nb, nbt, kn, s. . .
6 Ta . . .	. tsn, tn . . .	. t, tn. . .
7 Hes . . .	. ht . . .	. pt. . .
8 Cheper . . .	. t, th . . .	. tr (?). . .
9 Nouv . . .	. nt, nb . . .	. n, nb, nt. . .
10 To . . .	. tt, t . . .	. t, tt, ts, kn. . .
11 T'er . . .	. kl, skl . . .	. kl. . .
12 Hen . . .	. bt . . .	. b, bt, pt, hpt, apht. . .
13 Sahou . . .	. st . . .	. st, kl, tb, tp, htp, hb, kp. . .
14 Nechou . . .	. anth, sh . . .	. mg'o. . .
15 Iri . . .	. or, tn . . .	. a, n, o, r, p, bl, pl, br, pr, s. . .
16 Tem . . .	. oumt, am, a, m . . .	. m, um. . .
17 Mat'aou (abbr.)	msh, shm + msh, m, sh . . .	. mashi + mashi . . .

The discrepancy between the rival alphabets might be made still more striking, if the values of *all* the characters, phonetic and symbolic, in the three lines had been compared together. The third character, for instance, in the first line is not phonetic at all, according to M. de Rougé, except under certain conditions. According to Dr. Seyffarth, it is always phonetic, and stands for *thb*, *bt*, *p*, *chr*, *hr*, *kl*, *kr*, and *g'r*.

Even when both parties are agreed as to the value of a sign, it is absurd to conclude without further proof that one has borrowed from the other. Orbits depending upon different laws may intersect; but would any mathematician say that the points of intersection belong to one line rather than to the other? In his admirable dissertation on the inscription of the Tomb of Ahmes, M. de Rougé has given his reasons at full length for the values he has assigned to each hieroglyphic character. Are these reasons identical with those of Dr. Seyffarth?

2. It will, however, be said that, even supposing the disciples of Champollion have not stolen the syllabic values from Dr. S., they have at least stolen from him the idea of syllabic values. If this be the key, it would be a sufficient answer to say, that with such an instrument it would be as impossible to decipher texts, as to open real doors with an ideal key. But, after all, how comes this idea to be the personal property of Dr. Seyffarth, so that every one who uses it must first make an act of homage to him as the lawful owner? Is it through right of inheritance, or through right of conquest? It

nor the
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certainly is not through right of original invention. *This* which is right cannot be maintained in the teeth of facts noto- no inven- rious to all who have studied the history of hieroglyphic tion of discovery, and, after all, acknowledged both by Dr. Sey- Dr. S., ffarth and Dr. Uhleman. If the first assertion of the syl- but of labic use of hieroglyphs be the matter in litigation, the Dr. Dr. Young! rightful claimant is not Dr. Seyffarth, but Dr. Young! According to that celebrated Egyptologist, the first sign in the word "Berenice" represents the syllable *Ber*, the goose *Ken*, the lion *Ole*, and the snake *Ene*. And his view was, that the Egyptians used "syllabic and alphabetic writing, combined in a manner not extremely unlike the ludicrous mixtures of words and things with which children are sometimes amused". It is chiefly in reference to Young's supposed discoveries that Champollion denied the existence of syllabic signs, and at the time that he did so, the evidence was certainly on that side; because the first inquiries turned upon Greek, Roman, and other foreign names, and these are generally written with purely alphabetic characters. Seyffarth forgets this in his grammar, when he gives Young the credit of asserting the alphabetic but not the syllabic use of hieroglyphs.³⁴ In an earlier work³⁵ (published in 1840) his memory is more exact. "Until the time of Young", he says, "every one had supposed that the hieroglyphic characters signified words and whole ideas. After Young had shown that the hieroglyphs were letters and *syllables*, one immediately came to the belief", etc. Dr. Uhleman speaks still more strongly on the subject of Young:—"He has acquired the immortal merit of hav-

³⁴ Young's Discoveries in Hieroglyph. L. i. p. 47. Seyffarth, Gramm. Ægypt., p. xxvii. Compare p. xvi.: "Keine Hieroglyphe drückt *vocalisirte* Sylben wie *ole, bir, aus*". Is it on this ground that Young's claim is to be denied? In the first place, the objection asserts what is not true. The first *syllable* in the name of Antoninus is expressed by the Fish, and also by the Eye with the eyebrow (as distinguished from the Eye [= Iri] without the eyebrow). Of the former sign Dr. S. says, Gramm., p. 74, 336, *lautet an* in Antoninos: of the former, p. 45, 128, *lautet an* und *n* in Antoninos, Antinous. And it may be seen from the lithographed alphabet at the end of Dr. Seyffarth's grammar, that this syllabic value was one of those recognized by Champollion. The phonetic equivalents of these two signs in the various readings consist of a vowel and the letter *n*. See De Rougé, Tombeau d'Ahmes, p. 123, sq. In the second place, if Dr. Seyffarth puts Young out of the question because their notions differed as to the nature of the syllabic signs it is no less true that his own notion is not the same as that of the "Champollioner". Theirs is not more like his than like Young's.

³⁵ *Alphabeta Genuina*, p. 42.

ing first proved that the sacred writing of the ancient Egyptians really contained phonetic elements, alphabetic and *syllabic* signs. This glory no one will deny or dispute him".³⁶ All Dr. Young's syllabic values have unluckily turned out to be incorrect; but it is no less true that those of Dr. Seyffarth can as little be depended upon as the predictions of wind and rain in a sixth-rate weather almanack. The worst almanack has a certain amount at least of approximate truth in it. It does not predict ice in July, or the dog-days in February. It may give future generations a tolerably accurate view of the average weather throughout the year in a certain locality, even though it may have predicted wrongly for every particular day. There is no such truth about Dr. Seyffarth's syllabic alphabet. A certain number of signs have the right values (*among others*) attributed to them, but the strong antecedent chances with reference to every individual sign are that it has been wrongly interpreted. It is preposterous to fancy that one is tempted to steal treasures of this kind.

3. In the next place, Champollion's disciples have been guilty of no apostacy, but have only followed their master's example in attributing syllabic values to certain hieroglyphs. Dr. Uhleman strongly denies this, but his master is of a different opinion. The *Grammatica Ægyptiaca*³⁷ tells us, at least, that "Champollion himself finally adopted the system (!) of the author [why not that of Dr. Young?] and ascribed two consonants to several hieroglyphs—legte er . . . mehreren Hieroglyphen zwei consonanten bei". Dr. Seyffarth's partisans will do well to remember this when they feel tempted to give the lie direct to the same proposition when maintained by Champollion's followers.

That Champollion did really, before his death, admit a certain number of syllabic values, is undoubtedly a fact of great importance *in the controversy*. But this undeniable fact is of very trifling consequence indeed, when compared with the far more important fact that at his death he left the science in so advanced a state, that his successors could not long have followed in his steps without admitting the existence of syllabic characters, even if he had not done so himself. And to this conclusion they must have been forced, even if Young and Seyffarth

³⁶ Uhleman, Handbuch i. 33.

³⁷ p. xxxix.

Some syllabic signs admitted by Champollion himself,

and others discovered from data which he had collected.



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and Dr. Uhleman, the Hebrew word *Adir*. Are we to conclude at once that the sign is syllabic and simply equivalent to the consonants *ntr* or *dr*? We should certainly be justified in coming to this conclusion if we found it used to spell all kinds of words indifferently. But is this the case? In what word does it ever occur? “Das Beil drückt so oft es vorkommt, stets den einfachen Begriff Gott aus”. The Hatchet, says Dr. Uhleman, invariably expresses the simple notion, God. That is precisely what we mean when we say its use is ideographic or symbolic, not alphabetic or syllabic. And there are many signs which, like the Hatchet, are never used but to express a single idea. Until the contrary be proved, one of Dr. Seyffarth’s fundamental propositions is inadmissible.³⁹

The progress, however, from the notion of symbols read phonetically to that of syllabic characters is natural, and, under the conditions, inevitable. If Champollion has (to take an imaginary instance) taught me to read *Hont* whenever a certain character appears, and I find the sign used to spell the Egyptian words for *cat*, *kitchen*, *flute*, *wine*, etc.; if, besides this, I find it in proper names, where the Greek text of a bilingual papyrus reads *εντ* or *οντ*; if, again, I find various readings of these words, in which *h*, *n*, *t*, appear as its phonetic equivalents, it is not likely that I should think Champollion altogether wrong, even though I may have doubts as to the symbolic nature of the character in question. If the sign *Throne* be read *Hes*, the *Eye*, *Iri*, and the two together *Hes-iri* (the Egyptian name of Osiris), what is to prevent the same process

³⁹ Of course I do not mean to imply that, if the contrary be proved, the symbolic principle is refuted. One of the highest authorities on the subject (often referred to in this article), denies the distinction, asserted in Bunsen’s first volume, between the purely syllabic and mixed signs: “Cette distinction n’est pas fondée, car les signes syllabiques de M. de Bunsen ont tous un symbolisme principal comme ses signes mixtes, et ceux-ci de leur côté ne sont pas bornés dans leur emploi à l’idée dont ils sont le symbole”.—De Rougé, Tombeau d’Ahmes, p. 11. Lepsius, too, seems to consider all characters ideographic which are not simply alphabetic. As to Dr. Uhleman’s objection that the Hatchet cannot be considered symbolic, because *he* cannot see the rational connection between God and a Hatchet, it is sufficient to refer him to the ablest, as well as the most virulent, of Champollion’s antagonists. “Le lien qui dans ces sortes d’associations, rattache l’idée à son symbole, est tellement vague et tellement arbitraire, enfin emprunté à des notions si éloignées des nôtres, qu’il y aurait de la folie à tenter de le découvrir, hors des cas où la tradition nous l’a conservé”. Klaproth, Examen critique des travaux de feu M. Champollion, p. 12.

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taking place in all parallel cases, whether all the elements of a group or only a part be symbolical? This kind of syllabic value has been acknowledged from the very first by Champollion and his earliest followers. Champollion has hardly ever interpreted a line without having recourse to it. He even imagined, at one time, that the *stroke* mentioned in the earlier part of this article, was intended to point out the ideographic signs which should be read by the whole name of the object represented. Thus, a Goose with the stroke represented the sound *Si*; a Mouth with a stroke represented the sound *Ro*. A word formed of these elements he read *Siro*. The name of the Shepherds (Mena), a group of three signs, is read *Menachom* by Rossellini, because the third sign, an Eagle, in Egyptian *Achom*, is accompanied by the stroke.⁴⁰ Between Champollion's notion that certain hieroglyphic characters were to be read as expressing the sound of the name of the object represented, and that of Dr. Seyffarth, that these hieroglyphs represent the consonants of the name, the difference is not great, particularly if Champollion's teaching, with reference to the vowels, is taken into consideration. But if one of these notions is taken from the other, the lender is certainly not Dr. Seyffarth.

Let us take another case. A well known sign (the Abbre-
viations. Plant) frequently stands for the word *Suten* (king).⁴¹ It cannot, however, be taken as always standing for this word, or yet for the consonants of the word; nor can it be admitted as being simply the symbol of royalty. It is found with a mere alphabetic value in the names of the king Ramses,⁴² the god Khons, the city Suvan (Eilithyia), and the goddess of the same name; in *Krus*,⁴³ a sarcophagus, *Res*, the south, the preposition *Ensu*, and the personal

⁴⁰ See de Rougé, *ibid.*, p. 33. Compare Lepsius über die 22. ägyptische Königsdynastie, p. 292, note. Birch, Introduction to Study of Hierogl. p. 241. Champollion, Gram. Egypt. p. 59.

⁴¹ It occurs also in a number of titles, "royal wife", "royal mother", "royal son", etc. Some of these titles, *e.g.*, royal son, or prince of Kush, or of Suvan, belonged to high functionaries not necessarily of royal blood.

⁴² *E.g.* in the name of Ramses Miamun on the Tablet of Abydos, and on the Flaminian and Luxor obelisks.

⁴³ This form (written KRSU) occurs repeatedly in the 27th tomb of the Pyramids of Giseh, as represented in Lepsius' Denkmäler. Abth. ii. Bl. 76. In these inscriptions, which are as old as the Fifth Dynasty (or at least not much later), the Beetle is accompanied (on three occasions) by the signs *ch*, *p*, *r*. Here we have a far more ancient authority than any of those quoted by Mr. Birch in his interesting Letter to Le-tronne, in the Revue Archéologique, vol v. I know of several others.

pronoun *Su*. In different readings of the same word it is found as the phonetic equivalent of a common S. The most natural conclusion, therefore, consistent with all these facts, is that the character in question is in every case simply alphabetic, and that, when it stands for the word *Suten*, it does so as the initial or abbreviation of that word. Other nations used abbreviations in their inscriptions—why may not the Egyptians have done the same? It is no argument to say: “At quantum periculum, si littera initialis sola ad totam vocem exprimendam adhibetur!”⁴⁴ It may have been a dangerous practice, and yet in use.⁴⁵

The hypothesis of abbreviation, however, was insufficient to explain the use of a large number of signs, and in process of time it was found that many characters which had been thought alphabetic, really represented more than one letter.

The group, for instance, which was known to represent the divine name, *Amun*, is composed of three signs, which were not unreasonably supposed to represent the letters A, M, N, respectively.⁴⁶ The first and third were perfectly well known to be A and N. The value *M* seemed equally proved in a multitude of examples. It is, however, certain that in every one of these examples which can bear criticism, the sign for N followed, and was in fact redundant, it being merely the phonetic complement of the sign which it followed, and whose real

⁴⁴ Uhleman, *Inscript. Rosett.*, p. 135. Elsewhere, p. 60, he says: “Ægyptios vocem Neter significaturos solam litteram N scripsisse, et lectori permisisse ut reliquas litteras de sua sententia atque voluntate adderet nemo credere poterit”. Why not argue in the same way that the Romans could not have expressed “Dis Manibus”, by D.M.? If it be said that the marks of abbreviation prevented mistakes, is it not equally true that a sign which never expresses any other notion than that of God, is in no danger of being misunderstood? But the ancients did not always use marks of abbreviation. Inscriptions like the following (*Marm. Oxon*, p. 2, Tab. iv. xi. 2) are not uncommon:

ΙΟΥΑΥΡΑΝΤΙΠΑΤΡΟΣ [κ. τ. λ.]

ΑΝΕΘΗΚΕΝΕΤΟΥΣΔΑΜΦ

ΑΥΔΥΝΑΙΟΥΚΔ

This seems easy enough; but if we had had to acquire our whole knowledge of the Greek language from inscriptions like this, the case would have been different.

⁴⁵ L’empereur Justinien, bannit les sigles des livres de droit comme étant obscures énigmatiques et trop sujettes à caution . . . L’empereur Basile défendit aussi de les employer en pareil cas . . . Cependant malgré l’obscurité et le danger de cette écriture, on en a fait plus ou moins d’usage depuis les premiers temps jusqu’ à nos jours”.--*Millin, Dictionnaire des Beaux Arts*, III. 572.

⁴⁶ Plate I., B. e.

A sign which invariably appears as part or whole of the same syllable.



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ART. IV.—"The Sick-bed of Cuchulainn, and the only Jealousy of Eimer". [Quoted from the 'Yellow Book of Slane' in *Leabhar na h-Uidhre.*] By EUGENE CURRY, M.R.I.A.

(Concluded from vol. i. page 390).

Επις αζεραιτ υλαο,
 Ρουουρσι ρύαν ρλαν ρυβαδ,
 Όεσι ρίς Μαδα μοσρυτ,
 Νίτ λεσι ρεροδουο.

Όεδα αζύαλαινο λάν ουγλαιν,
 Όεδα αδουρηνυ κοκομραιν,
 Όεδα αδαιρηρτιυ σιννιτ ζλενο,
 Όεδα αρρετα ρίανρροδελ

Όεδα αδουραου κομβρίς,
 Όεδα αιγγελραιο ναρτομίν,
 Όεδα αρίζυ ρεμ ναζα,
 Όεδα αριζηνυ οερμάρα.

Όεδα τορραδ ζεμρνο ζλυαιρ,
 Όεδα καδινζναο αρηυαιρ,
 Όεδα λετ ιρρεο ρότζνί,
 Αρφαδτ, αροτ α ηαμλί.


Ις μετ, ní μαιτ, κοτλυο τρομ,
 Ιρ μερταν αρ νέκομλονο,
 Ιρ λοιμ ρορραιτ ρυαν ηιφατ,
 Τάναιρι όεσ εκκομναρτ,

Ρουύρις ρυαν ρίο αρ νόλ,
 Τελσι ριροβρυτ ρομόρ,
 Ηλαρ μβριαν μβλάιτ ροτδαρ,
 Επις αζεραιτ υλαο.

Επις αζεραιτ υλαο.

Ατραδτ, ιαρρομ Cúculainn ιαρρην οσυρ οοματ. λαιμ. οαμααζιο
 οσυρ ροδουρ. αμερτηνιζι οσυρ ατρομθαδτ οε, οσυρ. ατραδτ ιαρρην
 οσυρ τανις ρεμι ιαρρην κομβοί ιη αιρβι ροίρ. . . . Conacca cuci

¹ *King of Macha.*—This was Concobar Mac Nessa, king of Ulster, but named here from Emain-Macha, the capital city of his province.

[ ERRATA in the former part. At the end of the present article will be found a list of errata, consisting chiefly of certain Irish words which are not printed in the first part of this tale exactly in accordance with the ancient spelling of the original M.S. The attention of the reader is particularly requested to these corrections.]

Arise, O champion of Ulster.

Mayst thou awake from thy sleep in health and happiness;
Behold the King of Macha¹ of lovely form,
He will not allow thy great sleep.

Behold his shoulder full of crystal,
Behold his drinking horns with trophies,
Behold his chariots which sweep the valleys,
Behold the movements of his chess-warriors.

Behold his champions in their might,
Behold his noble, polished dames,
Behold his kings of valorous career,
Behold their exceedingly noble queens.

Behold the beginning of clear winter,
Behold all its wonders in their turn,
Behold thou that which it produces,
Its cold, its length, its want of beauty.

It is inertness, it is not good, heavy sleep,
It is adding enervation to incapacity for combat.
Long sleep is [the same as] drinking beyond a surfeit.
Debility is only second to death.

Awake thou from the fairy sleep thou hast drunk:
Cast it off with great, excessive ardour.
Many flowery words thou hast loved;
Arise, O champion of Ulster.

Arise, O champion of Ulster.

Cuchulainn then arose after that, and he drew his hand over his face, and he put his inertness and his heaviness off him; and he got up then, and he went forth afterwards till he stood in a place which he sought. And he saw coming towards him, after that, Liban; and the woman spoke to him; and she was inviting him to the fairy mansion (Sidh). “What place is Labraid in?” said Cuchulainn. “I will tell”, said she:—

ιαρην Liban, ocur moirio inoinzen fhuir, ocur báí ocaócú-
muo uintriú. Ciri airm hitá Labraio ol Cuculainn. Nin.
olri.

Ατά Labraio forlino zlan,
Dianaitiget buioniban,
Níbarcít let teét diauaio,
Maó arfir Labraoa luait.

Λάινιο τεέ αοεγ τινoben,
Cét eolac inti arioget,
Coraia conaloi uaca,
Samail zruaoi Labraoa.

Croúio coneno caça ceirp,
Fiaoaclaiuib tanaoeriz,
Bhuio iona buoen mbacé,
Bhuio rciaú lenna laeé.

Li rula acner irin tper,
Nimairio cairioi afoamler,
Inrice feruib ríoe,
Fer morelais móri mile.

Λαέου οαίβ, αμρι ρεόιλ,
Roiaét tír ecaé luil,
Folt fair amail flerca óir,
Boiao rína lía anóil.

Amru feruib rúabair nit,
Ir zarz ruciana cocric,
Riaou curac ocur zraiz,
Seé inir hita Labraio.

Fer conlur zrim uar ler,
Labraio lúac lam ar clairob,
Nirubano conroiti oe,
Ir fulanz rúain rocaioe.

Srianmuinci uerzoir rria zraiz,
Ocur nocono namma,
Tuirio airzic ocur zlain,
Irreo ril irtiz hita.

Ατα. Labraio for.

Ποσογραφα αρ Cúculainn αρ cuiriuo mná. Ticeo iarom, αρ



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inoinzen, loés anorút oir ceéreta. Tiat iarom ar Cúcu-
lainn. Atalaét loés iarom larinninzi, ocur do éuatar do-
mais lúada ocur don bilu buada ocur dar Oenac nemna
ocur in Oenac Fioza ocur ir anoride baí déo abrat conain-
zenaib.

Ferair fano failte firi loés. Cio diambaí Cuculainn cen
tíáctain oiri. Nir bo ail leirf tíáctain ar banúriu ocur
dan, corinnas innuaitriu poriaét firo.

Is uaim arri, ocur ticeo coluaét diairraizis amirnoiu curtir
in caé. Luro laés ateroó co airm imboí Cuculainn, ocur fano
malle fir. Cinnar rin alóiz ar Cuculainn. Rorrecair laés
ocur poraio: Ir miéiz teét, arre uair ita in caé ocaferctain
noiu. Ocur ir amlaio roboi ocaíao ocaí pocan láio.

Ranacra nemrebas ran,
bale inznas ciarboznáo,
Connici incaro fíctib oronz,
hirúair labraio lebarmonz.

Coruarura he rináaro,
Inaruro mílib arim,
Monz burde fair alli dat,
Ubuli oir ocaíáao.

Coromaiónirtar iaraim,
Alleino corera coicriabail,
Atberc rim, inragalim,
Donciz hirail faelbe fino.

Atát nadáriz irtiz,
Fairbe fino ocur labraio.
Tri caecait imcectar dé,
Iré lín innoéntaize.

² *Magh Luada*, that is, the Racing Plain. This place is not now known, a least to me.

³ *Bilé Buadha*, that is, the ancient Sacred Tree, or the victory tree—the winning-post of the racing plain perhaps. Not known to me.

⁴ *Oenach Emna*, that is, the fair, or assembly-place of Emania, which I believe to have been the public green, or *faithche*, of that celebrated city.

⁵ *Oenach Fidhgha*, that is, the Fair or Assembly-place of *Fidhgha*, or of the Woods. The name of this place would agree very well with the place now called the Fewes (*feadha*, or woods), but that this place is situated south of Emania, while the Oenach Fidhgha appears, from our text, to lie to the north of Emania. The place must, however, have been situated in this district, as it is found in an ancient tract in my possession grouped with the following places in Ulster, thus: Lurg, Lothar, Callainn, Fearnmhuighe, *Fidhgha*, Sruibh Bruin, Bernas, Dab-

Magh Luada,² and past the Bilé Buadha,³ and past Oenach Emna,⁴ and to Oenach Fidhgha,⁵ and it was there Aed Abrat was with his daughters.

Fand bid welcome to Laegh. “What was it that caused Cuchulainn not to come?” said she. “He did not like to come on a woman’s invitation, and also until he knew if it was from thee that an invitation reached him” [said Laegh]. “It was from me”, said she, “and let him come soon to visit us, for it is this day the battle is to be fought”.

Laegh went back to the place in which Cuchulainn was, and Fand along with him. “How is this, O Laegh?” said Cuchulainn. Laegh answered, and said: “It is time to come”, said he, “for the battle is being fought to day”. And it was so he was saying it; and he spoke a poem:—

I arrived, in my happy sportiveness,
At an uncommon residence, though it was common;
At the Card⁶ with scores of bands;
Where I found Labraid of the long flowing hair.

And I found him in the Card,
Sitting among thousands of weapons;
Yellow hair on him of most splendid colour,
An apple of gold closing it.⁷

And when he recognized me there,
With his crimson cloak five times folded,
He said unto me, “Wilt thou come with me
To the house in which is Faelbe Finn?”⁸

The two kings are in the house,—
Failbe Finn and Labraid,—
Three times fifty [men] around each of them;
It is the number of the one house.

hall, etc. Callainn, which precedes it in this group, is a well-known river near the city of Armagh, and Fearnmhuighe, which follows it, is the present Farney in the south of the county of Monaghan. It is evident, however, that all the places mentioned in the text were within a short distance of Emania, since we find that Laegh came back to that place for his master, and with him returned to fight the battle on the same day.

⁶ *Card*.—The word Carn is sometimes thus written.

⁷ *An apple of gold closing it*.—The hair was long, bound or platted, falling down behind, and terminating in a hollow ball or globe of gold, such, probably, as those which may be seen in the noble Museum of the Royal Irish Academy.

⁸ *Faelbe Finn*, that is, Failbe the fair-haired. Of this man there is no further mention made in our text, nor do I know anything more about him.

Caeca lépaó nalet̃ veirr,
 Ocur cáeca aini ver,
 Caeca lepaó no let̃ cí,
 Ocur caeca aeni oi.

Colba vo léptaib cnoða,
 Uáthe, pinna, forópa;
 Iiri cainveell aróirtá,
 In liá lógmar laineroá.

Ατατ αιριντοοριυ τίαη,
 Inrinnaic hifuneno zrián,
 Zraiz nžabor nžlar brecc amonž,
 Ir araile corcorono.

Ατάτ αιριν τοοριυ ταιη,
 Τιη bile vo corcorzlain,
 Oianzaiη in énlait̃ búan bláit̃,
 Oon macraio arrihízraít̃.

Ατά κρανο̃ inoοριυ λιη,
 Ní hétiž cocétul̃ friη,
 Κρανο̃ αιηζιτ̃ ηιητατιη zrián,
 Cormail̃ frihóri aroniám.

Ατάτ ανο̃ τιη fióit̃ κρανο̃,
 Comraic naó corraic ambairi,
 Biatari τιη cet̃ vo caó crunõ,
 Oo meη ilaropa imlum.

Ατά τιηηα ηιητρίο̃ érell,
 Cona τιη caecait̃ breclenõ,
 Ocur velz óη conali,
 In oé ceća breclenni.

Oabaó anõ vo mío meoμαó,
 Ocaoáil̃ forintežlaó,
 Marraio beór ir búan in ber,
 Conio biélan vo bižzner.

Ita inžen irtiž tpeil,
 Roveircaiz domnaib Erienõ,
 Corult̃ buoĩ tic immaó,
 Iiri alainõ illánaó.



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Incomráo doní micác,
 Iralaino, iringnát,
 Mairio cmió ceóuní,
 Diarrioc ir diaimuní.

Atribairt inoinzen tpeil,
 Coic ingilla nahaiénem,
 Maraú, tairbic ille,
 Zilla inoiri a Murtemne.

Do cúadurá co foill foill,
 Romgab ecla domonóir,
 Atbert rim inric ille,
 Oenmac dízriar Deótere.

Mairiz ná deóaro oóianaió,
 Ocur caó icáiarriar,
 Conaiceo immarita,
 In teómóir atconnaricrá.

Dambao lim Eriu ule,
 Ocur ríze bpez mbuoe,
 Dobéaraino, ní látarlac,
 Ar znair inbale ránaó
 Ranacra nem.

Ir maié rin ar Cúculainn. Ir maié ar loéz ocur ir cóir
 oul díaríáótain, ocur irmaié caó ni irrin tírri. Ocur irano
 arbert loez beór ffrifreom icinnirín oibniura in tríoa.

Atconnaric tír rorca ráer,
 Inhá ráiteri zó ná cloen,
 Fil ano ní rúamna buoen,
 Labriao luát lam ar clairob.

Octeót damdarraig lúada,
 Domárpar bilí búada,
 Rogabur immaiz denna,
 Ladánatraig imcenna.

Ir ano atribairt Líban,
 Irin balíu irrabammar,
 Robao inmain lem inriit,
 Diambáó Chú nobet icriót,

The converse which she holds with all,
It is delightful, it is uncommon;
The hearts of all men do break
For her love and her affection.

The noble maiden said:

“Who is the servant whom we do not know?
If thou beest he, come hither a while,—
The servant of the man from Muirtheimne”.

I went up softly, softly,—

I was seized with dread for my honour;
She said to me: “Will he come hither,
The only son of constant Dechtere?”

’Tis a pity that he [you] did not go a while ago,
And every one soliciting him [you];
That he [you] might see in its actual state
The great house which I have seen.

If all Eire had been mine,

And the sovereignty of the happy hills,
I would give it, no trifling deed,

For constant dwelling in the place that I arrived at.

I arrived, etc.

“That is good”, said Cuchulainn. “It is good”, said Laegh,
“and it is proper to go to reach it; and everything in that country
is good”. And Laegh then said farther to him relating the hap-
piness of the fairy mansion:—

I saw a country, bright, noble,

In which is not spoken falsehood nor guile;

In it there is a king of very great hosts,

Labraid of the quick hand at sword.

As I was passing over Magh Luada,

I beheld the gifted tree;

I passed the flowery plain

With two rapid advancing feet.

It was then Liban said,

In the place in which we were,

“How dear to me would be the miracle,

If it were Cuchulainn that were in thy shape”.

Αλαινὸ βαντραῶτ buaid cencāct,
Ingena Δέουα αβρατ,
Delbas Fainne fuáim collí,
Ní roāct rízna na rí.

Ατβερ, úair irlim roclof,
Síl nAodaim cen imarbor,
Delbaid irFainne remré,
Na ríl ano allectete.

Ατconnarc laécu collí,
Conarmmaid icimtibí,
Ατconnarc étaç noāta,
Nocon erreo anflata.

Ατconnarc mná féta ic fleio,
Ατconnarc aningenaid,
Ατconnarc zil lu zlána,
Ocimtect inoíroōromma.

Ατconnarc áer ciúil irtiz,
Icaerficiuo roonoinzin,
Menbas aluár tíra ammaç,
Domzentair cohétreómaç.

Ατconnarc in cnoc róbuí,
Αλαινὸ ben Eitne Insubai,
Açt inben atberar runo,
Berer narlúazú ara cunno.
Ατconnarc.

Luio Cuculainn lee iarom irtir ocur berit acarrat ler corancatar inninri. Feraib Labraid fáelti fhuú ocur ferrí in bantraōt uli ocur ferrair fano fáelti rinneodais fhu Coim-culainn. Cio rozentar runo hifeçtra ol Cuculainn. Nin. or Labraid, irreo rozenam, rezmai co rolam cor imónrluáz. Tíazait arr iarom corancatar tor na rluáz ocur corol-rat rúil tairriu, ocur báoirim leó in rluáz. Eiriz arr hifeçtra, ol Cuculainn fhu Labraid. Luio Labraid arr iarom ocur anair Cuculainn ocontrlóg. Fanóçrat inoariac orun-veçta. Do zenrat intrluáz. Irooiz olinrluáz inRíararta a hErimo irreo terçanait inoariac. Dorrennat intrluáz

⁹ *The Hill*, that is, the hill in which the Sidh, or Fairy mansion, was situated.

¹⁰ *Riastartha*, that is, the angered man; the man whose face became distorted with anger, as Cuchulainn's was accustomed to do.



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ιαρομ conná fuaíη ineo leó ιητίη. Όοταέτ Εοόαιο Ιυιλ ιαρομ
 οο inluc alam οον τιηραιτ ματαιη μοό. Ατconαιηc Cucu-
 λαιηη ιαρομ α ζυάλαιηο τηρηη Cocull. Όολέci ζαι οό con-
 λυιο τηίτ. Κομαηb τηίαι φοητηίcαιτ οίb αοεηαι. Τοφοβαιητ
 ιαηρηη Senac Siaborca, ocuη φεηαιτ μοηζλεό, ocuη μαηηbctuη
 Cuculainη ιαρομ. Τιc Λαηηαιο ιοηομ ocuη mebaiη ηιαη
 φοηηηα ηλόζυ. Κοζαίο Λαηηαιο οό αηαο οηηοηηζυηη. Ατα-
 ζαμαη τηα, φοη Λοεζ, ηη φεη οηηηηητ α φεηci φοηηο υάηη ηαó
 λóη λειη οηcaó φύαιη. Τιαζαη, φοηΛοεζ, ocuη ηηηιτηη τηοηα
 οαbca υάηηηci οοοηηούο αβηοca. Ιηcετηα οαβαó ιτέτ φίciο
 τηηηε. Ιηηοαβαó τηαηηηε ηηηφοοαηη ηεcaηατηε. Ιητηηεη οαβαó
 ιη comηe ατηε. Ιητηη ατconcaταη ηα ηηά Coηηcυλαιηη ιη αηηο
 caóαιη φαηηο ηηηο.

Seζoa cαιηητεó οocηηζ ηοτ,
 Ceuη αμυλαó ιη óc,
 Αλαιηο λύαοαη λυαοεη bλαι,
 φεηcuη ιαηηΟéηuc φηοζαι.

ηη ceól ηηοe ηεol φοοζαιη,
 Ιηηφοηοαó φολα φηλ φαιη,
 Cηοηάη caηαη [caηηατ] óηεητ,
 φocαηατ ηοιó αcaηηαητ.

Eic φηλ φó caηηυτ ζηηηηe,
 Αηηηηη. céηη coηηοαηηηηe,
 ηηφηη αηαηαιη οηζηαηηζ,
 Ιτλυαóηοηη ζαίó ηεηηαηηζ.

Imbeη coícοeic ubull óηη,
 Οηcληηητ φοη α αηόηλ,
 ηη φυαιη αηαηαιη οηηηηζ,
 Ετηη ηηηη ocuη αηηηηηη.

φηλ iceóταη αοαζηηύαο,
 Τιβηη οεηηζ αηαιη cηύ ηυάο,
 Τιβηη υαηη τηβηη ζοηηη,
 Τιβηη coηηcηα οαó ηέτηόηη.

φηλ ηεóτ ηυηηηe αη αηηηηc,
 ηη ηcél φάcbάλα ηη λυηc,

¹¹ *If he be beardless he is young.*—A beardless warrior of mature age was held in contempt by the ancient Irish, and hence Fand's apology for her beloved Cuchulainn's want of that manly appendage.

Eochaid Iuil went afterwards to wash his hands at the spring at early morning. Cuchulainn now saw his bare shoulder through the *Cochall* (Cucullus). He threw a spear at him, and it passed through him. He slew three-and-thirty of them alone. He was then attacked by Senach Siabortha [the spectral], and they fought a great battle, and Cuchulainn killed him at the end. Labraid came then and broke the hosts before him [before them]. Labraid prayed him [Cuchulainn] to desist from the slaughter. “We may fear”, said Laegh, “that the man will ply his rage upon us, since he has not had enough of battle”.

“Let persons go”, said Laegh, “and let three keeves of cold water be prepared to extinguish his heat. The first keeve into which he goes boils over; the second keeve, no person could bear for its heat; the heat of the third keeve is supportable”.

When the women saw Cuchulainn, it was then Fand sang:—

Stately the charioteer that steps the road,
 If he be beardless¹¹ he is young,
 Splendid the career in which he careers over the plain,
 At eve, on the fair-green of Fidgai.

It is not fairy music of couches that serves him,
 It is the deep colour of blood that is upon him;
 The purring¹² which the bodies of [other] chariots yield
 Is sung by the wheels of *his* chariot.

The steeds which are under his firm chariot,
 I stand without motion viewing them;
 Their like of a stud is not known;
 They are fleet as the wind of spring.

Five times ten apples of gold he plays,
 Above they dance upon his breath;
 No king their like has ever obtained
 Among the noble and ignoble

There is in each of his two cheeks
 A red dimple like red blood,
 A green dimple, a brown dimple,
 A crimson dimple of light colour.

There are seven lights upon [in] his eye,—
 It is not a fact to be left unspoken,—

¹² *The purring*; that is, the purring or murmur that proceeded from the motion of the wicker, or lathy body of any other chariot, was not less noisy than the rolling of the wheels of *his* chariot.

Imoenum rula raine,
Abpatcáin uba daile.

Filfor aceno cio fófer,
Atclor fóθmno imbel,
Tm foiltni co raine dač,
Silla óac amulac.

Clairob ruyri roinob crú,
Conaimoumno aigzoiou,
Sciač combualio óirbuoi,
Ocur combil finoraine.

Cingio darriu in cačtino,
Imčéit ináz inerlino,
Niril uobaro cruaio laino
Ar cormail fmi Coinculaino.

Cuculainn do čaét ille,
Intóclacéč a Murtemne,
Iriac uópac runn hifac,
Ingena Aea Abpac.

Uroénan fola fota flano,
La toéb crano comaroa de,
Uallač uabreč áno la zol,
Mairz fmi[ra] riabpape.
Sezoa.

Ferair Liban faelcti fmir iartain, conano arbert inroir:—
Fočen Cuculaino, toric (.i. mi) toračtaibe, mal mór Mairzi
Murtemni, már amenma mair, curao cačbúadač, cribe niao,
nerctia zair[c]e, flanoθmno ferai, aurlam fmi fipacpac lač
ngaiie Ulaa, alaino alí, lí rula do anorib, ir fočen.
Fočen Cuculaino.

Cerc ciθoθonair a Cuculainn or Liban fmir. Ipano ar-
bert Cuculainn anoaibe.

Tarlucur urcur uompleiz,
Inounao Eozain Inbir,
Noconfetur, ročla pet,
Inbúairo uorizniur no in bet.

¹³ *Three heads of hair*.—Tm foiltn batar fair. Oono fmi toino cino; cró-
oerz ar meóen; mino orbuioe apoozuečar. Three heads of hair that
were on him. Brown at the skin of the head; blood-red at the middle; a dia-
dem of yellow gold at the surface. (*Tain-Bo-Chuailgne*, in *Lebhar na h-Uidhre*,
folio 58).



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Ciofepph ciofepph domniht,
 Corpe ní tárlur domcirt,
 Urcur anfir fih hiceó,
 Ber nanárlairi duni beo.

Slog fih fofoerz fofoerz ec,
 Dompoirritar fofoerz,
 Munter Mananvan mic lir,
 Cotazart Eozan Inbir.

Immimrouf cipe cruít,
 Intan tánic molan lúít,
 Oenfer dia trica cet,
 Condarucur docom néc.

Roçualá cneit Eçac lúil,
 Iroçraioi labraio biuil,
 Mað fih confir ber nircat,
 Inturcun matarlacao.

Ταρλucur urcun.

Fóio Cúculainn iarrih larinninzih ocuf anair mír ina far-
 mað, ocuf celebrairi hi cino mír oi, ocuf atbertri fhirrim:
 In bale arri, atberaru fhirma duí iccomóail maçatpa. Ocuf
 irano doρόνηρατ comóail iclbur Cino Tpaçta. Roinnir do
 Emir anírin. Do rónra pçena accirpe domarbaso nainzine.
 Tánic ocuf coéca inzen lee connici in comóail. Ir ano roboí
 Cuculainn ocuf loéz oc immiht firocilli, ocuf ní po arizret
 namná çucu. Ir ano poráçais fano ocuf arberc fpi loéz:
 Fézpu aláiz aní atçiuça. Cioinrin ar loéz. Derçair loéz,
 ocuf irano poraoi inoinzen inro .i. Emer [fano].

Féz alóiz çarçeir, occoirteçt fpiç filec mná cópi, çiall-
 maçi, corçenair çlarçéçair inanoerlamair, conór fpiçanuçt-
 brunnib cruít cáin, atçiciter amail teçair láit çairte çarçat
 çairpçiu, çlé poroi çné Emer inzen forçaill.

Nítázapa, ar Cuculainn, ocuf ní conçora etir. Tairriu
 irin çreit çumaçta larinruoi nçriánra, fofoerzçrea fo-
 déin arpoçerarcainbreç ar anorib ilib imoair hiceçarairi
 Ulaç, arcianor baizçea inzen forçaill a huçt açomalta im-
 çnám cocumaçta, ber nilím lamáçair. Arberc beór Cucu-
 lainn:—

Not peçnairpeç aben, amail peçnar çác açáçair; nçrubim-
 peç doççae çruçáio çruçlámaç, naç doççian tím çanairi, naç
 çferz çreít çimairçteç, arir mópi çoliz monerç doççor ónirç

¹⁵ *Thirty and an hundred.*—In the prose it is *three and thirty*.

Whether better, whether worse be my strength,
 Hitherto I have not cast of my little [dart]
 The erroneous throw of a man in a fog,
 [Or one] which did not certainly reach a living person.

A host fair, red complexioned, on backs of steeds,
 They pierced me upon all sides;
 The people of Manannan, son of Ler,
 Invoked by Eogan of Inber.

I gave wound for wound, in whatever way,
 When my full strength returned;
 One man after thirty and an hundred¹⁵
 Did I bring unto death.

I heard the groan of Eochaid Iuil,
 It is in good friendship his lips speak,
 If the man has spoken truth, it certainly has won the battle,
 The throw which has been thrown.

I threw, etc.

Cuchulainn then retired with the maiden [Fand] and remained a month with her; and he took his leave of her at the end of a month; and she said to him: “Whatever place thou desirest me to go to meet thee at, I shall go there”. And where they made their assignation was, at Ibar-Cinn-Trachta (Newry).

All this was told to Emer. She had knives made for her to kill the maiden. She [Emer] came, and fifty maidens along with her, to the [appointed place of] meeting. Here Cuchulainn and Laegh were playing chess, and they did not perceive the women approaching them. Then Fand perceived them, and she said to Laegh: “Look you, Laegh, at what I see”. “What is that?” said Laegh. Laegh looked, and then the maiden, that is Emer, [*recte* Fand], said this:—

“Look, O Laegh, behind thee; listening to thee there are proper women of good sense, with green sharp knives in their right hands, with gold at their beautifully-formed bosom-breasts; they move in the manner in which champions of valour go through a battle of chariots. Well does Emer, the daughter of Forgall, change colour”.

“She shall not take vengeance”, said Cuchulainn, “and she shall not reach thee at all. Come thou into the ornamented chariot with the sunny seat, opposite my own face, for I will defend thee from many numerous maidens at the four points of Ulster; for although Forgall’s daughter may threaten, on the strength

mná. Cere trá, ar Emei cio fóormair latru a Cúculainn,
 mo dímiarra fíao anoirib ilib in éuicío, ocur fíao anoirib ilib
 na hEreuo, ocur fíao aéi eniz aréna, arirrot clit tánaora,
 ocur fo ollbríz do éariren, arcianót bagea uall oll imrean,
 béi niráoirit latru mo lecuira azillai cíanoótríallá. Cere
 tra, aEmei, ar Cuculainn, cio ar na leicrioeá oamra moe-
 nur inoáil mná. Aréetur inbenra, irri in zlan, zenmnaiio,
 zel, zarra,; oingbála do ríz iléioóraig inoingeniin oóton-
 naiib oar leiraiib lánmóiraiib, conoeilb ocur écoirc, ocur foéirce-
 nel, conoimni, ocur lamoa, ocur lamtoimio, co ceill, ocur
 éono ocur cabraioeét, conimmao eé ocur bóctánte; ar nífil
 fónim ní baotoi ría coémcéle na oingneo cíano comzeilla.
 aEmei, arre, ní fairgebaru curaiio cáin crectac catbúadaé
 báoamfirra. Beirar Emei, noconneri in ben oia lenai. Act
 éna, iralaino ceé noeriz, irzelcaénuia, ir cáin ceéaro, irreirb
 caé znát, cáio ceé nécmair, irraill ceénaiénoio cofertar caé-
 neólar. Azillai, arri, robámarri feét cocátaiio acut ocur
 nobemmír ooiri oiambao ailouitriu. Ocur robo oozraé
 furri. Oarimbreéir tra, arre, irattailriu oamra, ocur bioat-
 ail hicéin batbéo. Molecuora oin, olfanó. Ir coru mo
 lecuora ar Emei. Náto, orfanó, meiri leicrioir anó ocur ir
 mé robaezlaizeo oéin; ocur foioóraiio ocoozra ocur ocoo-
 menmair móir ar bánar leé alécuo ocur oul oíatiz acétoir,
 ocur mo buaoir inoozrao hí ooraé do Comculainn; ocur ir
 amlaio roboí oc oozru ocur ooiri in laioira;—

Merre razar foirartur,
 Ceoec lim arimóir zerzul,
 Ceta nec lín ablaó,
 Robaoferri lim tairrem.

Robaoferri lim bit hirur,
 Dobet fótlaim cenobur,
 Náoula, cioiznao lat,
 Co zriánan aéoa abraé.

aEmei irlat infer,
 Ocur romela aoeizben,
 Aní naroié lam cioaét,
 Ir écen oam aóútraét.

Moireri roboí comairraio,
 Eter élitari ir oiamair,
 Nocooerinao ríú moóál,
 Oáiz ir miri roirrián.



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Μαιρις υοβειρ ρειρς υουουι,
 Μενερταρδα υια αιρι,
 Ιρρερρ υονεοδ δσορ αρρ,
 Μενεδαρταρ μαρδαραρ.

Coéca ban tánac ille,
 A Emeir an foltbuioe,
 Do tarcaio arfaio níó,
 Ir dámarbas ar anó.

Ατάτ τρι caecait mimla,
 Do mnaiB aille oentamá,
 Acum inóún imalle,
 Nocotreibitir merre.
 Mere.

Ιαριρρ ρόφαλλριζεο υο Μανανυαν ανίριρρ .i. ρανο ινζεν Δέυα Δβρατ υοβιτ inecomlano icmnaiB υλαο, ocur a biτ co-alecuo υο Choineulainn. Τανιc ιαρom Μαναννάν αναιρ υο-ραιζιο nahingini, ocur ροβοί ινα ρίασναιρε, ocur ní ρορατ αιζ neτ υίB ανίριρρ δcτ ρανο δhoenuρ; ocur ιρ ανο ριρ ροζαB eτepe μοιρ ocur υροδmenmair inningin oc ρεζαο Μανανυάν, ocur υοριζιο λαιο:—

Ρέζαιο mac laeáraiοι λιρ,
 Do maiγiB eόζαιρ ιnβιρ,
 Μαναννάν υάρ υοmun υιηο,
 Roboi tanrop inmair λιm.

Μαυιηοιυ βάυιζραιρ nuáll,
 Nícarano momenma muáo,
 Ir éραιρε ιnrét ιnrerpc,
 Téit áheól cen immitect.

Λά ροβάρα ocur mac λιρ,
 Hingrianan Dúni ιnβιρ,
 Ροροδóιζ λιηο cenαναο,
 Nocobíao arnirpcarao.

Θανamctuc Manannan marρ,
 Robam céle comadar,
 Nocoberao oρm ριαλιηο,
 Clući epail arrhoíl.

¹⁶ *Though there is a man of equal fame.*—That is, although she had her father, a man of as full fame as Cúchulainn, to go to, still she would prefer to stay with the latter.

I it is that shall go on the journey ;
I give consent with great affliction ;
Though there is a man of equal fame,¹⁶
I would prefer to remain.

I would rather be here,
To be subject to thee, without grief,
Than to go, though it may wonder thee,
To the sunny palace of Aed Abrat.

O Emer ! the man is thine,
And well mayst thou wear him, thou good woman,—
What my arm cannot reach, what but
That I am forced to wish it well.

Many were the men that were asking for me,
Both in the court and in the desert ;
Never with those did I hold a meeting,
Because I it was that was righteous.

Woe ! to give love to a person,
If he does not take notice of it ;
It is better for a person to be turned away,
Unless he is loved as he loves.

With fifty women hast thou come hither,
O Emer of the yellow hair,
To arrest Fand ; it was not well,
And to kill her in her misery.

There are three times fifty, during my days,
Of women, beautiful and unwedded,
With me in my court together ;
They would not abandon me !

I it is, etc

Now, all this was revealed to Manannan ; namely, Fand, the daughter of Aed Abrat, to be engaged in an unequal conflict with the women of Ulster, and that Cuchulainn was putting her away. Manannan then came from the east to seek the maiden ; and he was in their presence, and no one of them perceived him but Fand alone ; and then a great terror and bad spirits seized on the maiden on seeing Manannan, and she made a poem :—

Behold ye the valiant son of Ler,
From the plains of Eogan of Inber,—

Danam̃uc Manañvan mar̃r,
 Robam céle com̃dar,
 Dor̃narc̃ dór̃ a[̃]rom̃tá,
 Tuc̃ dam̃ illúas̃ mim̃ber̃g̃tá

Báí ac̃am̃ dar̃ r̃raec̃ im̃mac̃,
 Caeca iñgeñ ill̃oat̃ac̃,
 Dor̃atur̃ dó caeca r̃er̃
 Centar̃, iñ caeca iñgeñ.

Cet̃ra caecat̃ ceñmir̃i,
 Irr̃é lũct̃ iñnoént̃ig̃i,
 Dá caecat̃ r̃er̃ roñmẽc̃ r̃lán,
 Dá caecat̃ bañ r̃ino r̃ollán.

At̃ciũ dar̃iñm̃uir̃ il̃le,
 Nínac̃eño nac̃mẽraiz̃e,
 Mar̃cãc̃ iñmar̃a moñg̃aiz̃,
 Níleñaño dor̃it̃loñg̃aib̃.

Tim̃t̃ẽct̃ reõc̃aiñnĩ cor̃e,
 Niac̃eño ac̃t̃ r̃í̃õaiz̃e,
 Mar̃aiõ dõ c̃iall̃ cẽc̃ r̃lũás̃ r̃éim̃,
 Cí̃abeit̃ ũáit̃ iñetẽrc̃éiñ.

Mas̃ mer̃re, bá̃oet̃ber̃ dam̃,
 Dáiz̃ at̃baé̃ta c̃iallã bañ,
 Iñtí̃ rõc̃ar̃ur̃ cõhol̃l̃,
 Dor̃mat̃ r̃uño iñ ecom̃loño.

Celebr̃as̃ d̃it̃ aChú̃ c̃áiñ,
 Ar̃o r̃inõ ũait̃ cor̃oc̃raiõ,
 Céñ cot̃í̃ram̃ d̃ú̃t̃rãct̃ l̃inõ,
 Ir̃ ar̃o cẽc̃ rẽct̃ cõ him̃c̃im̃.

Er̃ze r̃éõ mĩt̃iz̃ dam̃ra,
 At̃á nẽc̃ r̃ir̃ ñiõ añora,
 Ir̃m̃ór̃ iñt̃oc̃or̃ol̃ tra,
 Al̃áiz̃, amaic̃ Rí̃añg̃ab̃ra.

¹⁷ *A sidhaighe*.—This is the same as *Benshee*, when applied to a woman, or *Fershee*, when a man. It signifies a being from the Sidhs, or mansions of the immortals of the invisible world;—the beings called fairies in our times.



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As for me, I would have cause,
Because the minds of women are silly;
The person whom I loved exceedingly
Has placed me here at a disadvantage.

I bid thee adieu, O beautiful Cu;
Hence we depart from thee with a good heart;
Though we return not, be thy good will with us;
Every condition is noble to [in comparison with] that of
going away.

A departure this which it is time for me [to make];
There is a person to whom it is not grief;¹⁸
It is, however, a great disgrace,
O Laegh, O son of Rianganabra.

I shall go with my own spouse,
Because he will not show me disobedience,
That ye should not say it is a secret departure,
If ye desire it, behold ye.

Behold, etc.

The woman went after Manannan then, and Manannan bade her welcome, and said: “Good, O woman”, said he, “is it attending Cuchulainn thou wilt be henceforth, or is it with me thou wilt go?” “By our word, now”, said she, “there is of you one whom I would rather follow than the other; but”, said she, “it is along with thee I shall go, and I shall not wait on Cuchulainn, because he has abandoned me; and, another thing, thou good man, thou hast not a dignified queen; Cuchulainn, however, has”.

When Cuchulainn, now, saw the woman departing from him to Manannan, he said to Laegh: “What is that?” said he. “This”, said Laegh; “it is Fand that is going to Manannan, the son of Ler, because she was not pleasing to thee”.

It was then Cuchulainn leaped the three high leaps, and the three south leaps of Luachair;¹⁹ and he remained for a long time without drink, without food, among the mountains; and where he slept each night was on the Slighi (road) of Midhluachair.

Emer, in the mean time, went to visit Concobar to Emania; and she told him the state that Cuchulainn was in.

Concobar sent the poets, and the professional men, and the druids of Ulster to visit him, that they might arrest him, and that they might bring him to Emania along with them. He, however, attempted to kill the professional party. These pro-

nounced druidical incantations against him, until they laid hold of his legs and his arms, until he recovered a little of his senses. He then besought them for a drink. The druids gave him a drink of forgetfulness. The moment he drank the drink he did not remember Fand and all the things that he had done. There were, too, drinks of forgetfulness of her jealousy given to Emer, for she was in no better condition [than him]. Manannan in the meantime shook his cloak between Cuchulainn and Fand, to the end that they should never again meet. So that this was a vision of being stricken by the people of the sidhe [or fairy mansions] to Cuchulainn: for the demoniac power was great before the Faith; and such was its greatness that the demons used to corporeally tempt the people, and that they used to show them delights and secrets, as of how they would be in immortality. It was thus they used to be believed in. So that it was to phantoms the ignorant used to apply the names of *Sidhe* and *Aes Sidhe*.

ERRATA IN THE FORMER PART.

- Page 370, line 1, for *υλλτα*, read *υλλτυ*.
 " " line 18, for *ρυρρο*, read *φορρο*.
 " 372, line 7, for *ορεctu*, read *ορεcta*.
 " " " for *cetuzebctair*, read *cetazebctair*.
 " " line 26, for *Cυρcραιo meno*, read *Cυρcραιo meno maća*.
 " " line 37, for *οιb*, read *οιιb*.
 " 374, line 6, for *οιατιραo*, read *οιατιρατ*.
 " 376, line 3, for *ναccumactu*, read *ναccumacta*.
 " " line 14, for *coτλωo*, read *coτλυo*.
 " 378, line 16, for *Рιcρiο*, read *Рιcρeo*.
 " " line 28, for *Oenzar*, read *Oenzur*.
 " 380, line 2, for *νιμαιτ' οηα*, read *νιμαιτ' ούν*.
 " 384, line 16, for *occetri*, read *occpetri*, though the first is the correct form, the *η* between *c* and *e* being a mere mistake of the old scribe.
 " 386, line 11, for *ιμiρaηo*, read *ιμiρaο*.
 " " line 17, for *τοcomλαάτ*, read *τοcomλυατ*.
 " " line 21, for *coαηoγa*, read *coαηγa*.
 " 388, line 15, for *αηραoαιb*, read *αηραταιb*.
 " " " for *conooτpυiοi*, read *conooτpυoi*.
 " " line 23 for *Canall*, read *Conall*.
 " 390, line 9, for *ρυιρbαιoi*, read *ρυιρbαιoi*.
 " " line 19, for *cρiοe*, read *cρiοi*.
 " " line 21, for *moctpυoe*, read *moctpυaioe*.
 " " line 28, for *φοοpοcρυτ'*, read *φοοpοcρυτ'*.

[From a poem of thirty six stanzas, written by Flann, the Professor of Monasterboice, who died A.D. 1056, and preserved in the ancient Book of Leinster, fol. 6, in the Library of Trinity College, Dublin, on the manner of death of the chief men of the Tuatha De Dannan, it appears that Eogan of Inber was killed by Eochaid Iuil, and that Eochaid himself fell in his turn by Aed Abrat and Labraid of the quick hand at sword.]



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mena can call forth, but also by the errors which a one-sided or partial view of anything invariably introduces. Individuals have, no doubt, particular predilections, as they must have special aptitudes; but these favour the advance of knowledge, and do not of themselves constitute one-sidedness, or deter one from recognizing the general truths, that real intellectual progress requires the simultaneous advance of all kinds of knowledge, and that there are few branches of science in the investigation of which we may not derive aid either immediately or remotely from all others.

Philo-
logy not
aided by
natural
science.

Contrast
between
Pliny
and mo-
dern na-
turalists.

Philolo-
gists do
not re-
cognize
the use
of na-
tural
science.

As an example of the isolated investigation of a science, I may mention that philology, although dealing with the words which express the names of the objects of natural history, has hitherto received no aid from the latter, and philologists carry out their investigations as if words were abstract conceptions, independent of matter. They have, to be sure, met naturalists occasionally upon some common ground, such as the determination of the plants mentioned by Greek and Latin authors; but, with few exceptions, like A. v. Humboldt, the investigations of both have generally been conducted in utter forgetfulness of each other's existence. How rarely does the naturalist who visits remote regions bestow a thought upon the labours of the philologist; and even when he does collect vocabularies, it is singular that the native names of the plants or animals which he gathers are rarely if ever included therein. Jacob Grimm has some very appropriate remarks upon this subject, which I will quote. "Pliny", he says, "has spread a peculiar charm over his natural history by not disdain- ing to also circumstantially mention the superstitious opinions of the people about animals and plants; how his veneration for antiquity, his versatile description contrasts with the dry earnestness of our modern naturalist, who bestows not a thought on the customs of home, and esteems as insignificant all the force and ornament of German expression".¹ On the other hand, the philologist has failed to recognize the utility of the physical and natural sciences as instruments of research. My first object, then, was to endeavour to establish the claim of the physical and natural sciences to be considered as indispensable aids in the discussion of ethnological and philological questions: hence, I had to address philolo-

¹ Deutsche Mythologie, Bd 2, S. 1142. 3^{te}. Ausg.

gists. My second object was to show what naturalists might do for the latter, and through them for history: the second class which I designed to address was, consequently, that of naturalists, in the broadest acceptation of the term. Objects in View.

This explanation of my objects, will, I hope, serve as an apology for the elementary character and magnitude of my introduction. But I also plead other excuses. In the first place, I had no option but to make such a summary in the shape of a separate article, or to interweave it as explanatory matter with my own peculiar views; for it is evident that, in recording the results of any investigation, the method should either be fully described, or its leading features indicated. I believe the course adopted to be the most useful and convenient, though I am conscious of having thereby incurred the penalty of exciting expectations which may not be fulfilled. Why first article was written.

As I only undertook to show how an investigation might be conducted, rather than to actually make one, I must needs, in order to maintain the unity of my conception, compress the whole into one article. My illustrations must, therefore, be few, and rarely fully worked out; indeed, it would require as many pages as I can devote lines, to give a tolerably complete sketch of one of the examples upon which I could best rely. The very extent of the subject, and its ramifications into other sciences, will compel me to select those illustrations almost at random; a circumstance which, taken in conjunction with my inability to develop them here fully, cannot fail to give an incomplete and fragmentary character to the whole. Subject must be treated in one article. Effects of this.

The influence of the sensuous upon the ideal, has been long since recognized by many, and by none so clearly as by the illustrious A. v. Humboldt; this fact is rendered evident everywhere in his *Cosmos*. But, beyond the recognition of the general principle, nobody, so far as I am aware, has minutely investigated the character of this influence with the view of discovering whether it might serve as a method of verification for ethnological and philological hypotheses in cases where historical evidence is absent or deficient, and thus help to make these sciences strictly inductive. This is what I am about to attempt. Although a very large part of the evidence which I shall bring forward is, so far as I know, new, yet I would beg to remind the reader that it is rather by the use which I Action of matter upon mind already recognized, but its use in Ethnology not.

propose to make of that evidence that I desire to justify my writing upon the subject. Hence it matters little, as regards the final structure, whether the materials be old or new, except, indeed, that it may make philologists somewhat more indulgent with regard to any errors which I may have committed in details.

General proposition.

Division of subject into three parts.

The general proposition laid down in my first article² may be thus summarized: that the action of the sensuous upon the ideal begins with the formation of the single articulated sounds, and continues through the subsequent stages of the combination of simple sounds, to words which are symbols of definite ideas, and of words to sentences or the correlation of ideas. These successive stages suggest a natural classification of my subject into three parts. In the first I propose to treat of the coördination of the phonetic peculiarities of languages; in the second, of the objective relations of words, and of the use of the names of animals and plants as ethnological fossils; and, in the third, of the connection of myths with natural phenomena, and the influence of nature in developing the characteristic features of primitive literatures.

§ 1.

Suggestions only, in Part I.

In the first part I can only offer suggestions, illustrating them by some results borrowed from others, and some of my own,—of very secondary value, however, because, although costing a great deal of labour, they were never intended to express more than general features.

Classification of phonetic peculiarities.

The phonetic peculiarities of languages may be arranged under the following categories: 1. the relative quantity of vocal intonation, or the ratio of vowels to consonants; 2. the ratio of pure to impure vowels; 3. the ratio between the chief or older vowels *a*, *i*, *u*, and the newer *e* and *o*; 4. the ratio between the individual vowels; 5. the ratio between the continuous and explosive consonants; 6. the relative proportions between the different kinds of explosive consonants—(*a*) classified into homorganic, *i. e.*, labials, dentals, and palatals; (*b*), according to material or homogeneously, *i. e.*, into mediæ, tenues, and aspiratæ; 7. ratio between the several liquids; 8. relative proportion of vowels, sibilants, liquids, labial, dental, and palatal mutes,

² Atlantis, vol. i. p. 53.



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Ratio between the dif- ferent catego- ries of mutes.	Homorganic.			Homogeneous.		
	<i>Labials.</i>	<i>Dentals.</i>	<i>Palatals.</i>	<i>Mediae.</i>	<i>Tenues.</i>	<i>Aspiratae.</i>
Greek,...	12	22	8	6	30	6
Latin, ...	8	22	9	10	28	—
Gothic,	3	20	12	8	5	11
Sanscrit,	8	18	6	11	20	7
Yakutish,	11 to 12	21	13 to 14	12	29	5
Magyar,	5 to 6	15 to 16	14	12	22	3

Ratio
between
liquids.

As regards liquids, *n* has everywhere the preponderance, *l* being generally less frequent; the ratio of the two varies very much however; thus, in Sanscrit, the ratio of *l* to *n* is as 1:9; in Yakutish, 1:3; in Magyar, 1:1.3.

Ratio
between
the diffe-
rent let-
ters in
the an-
laut.

One of the most important points of distinction between languages consists in the relative proportion in which the several letters form the anlaut. I do not here allude to the relative proportion in all the words of a language, but in ordinary conversation and literature. Languages very closely connected as members of the same family may exhibit very considerable differences in this respect, if they belong to the class whose grammatical forms are fully developed, and where the root is often in the centre of the word. In languages in which the grammatical forms are made by affixes, as in the northern family, there may be greater similarity of anlaut, while there may be great differences of auslaut.

Conso-
nant
combi-
nation.

Most of the preceding differential circumstances would serve rather to establish some general laws than to distinguish individual languages; it is true, we may partially except that of the anlaut—for example, while *k* is a frequent anlaut of the Finnic-Tatarian languages, and among others in four dialects of the Samoyede, it is not known in the Yurak-Samoyede. Gemination and consonant combination, on the other hand, afford much more specific and peculiar points of distinction. Thus, while German is remarkable for its hard, peculiar combinations of consonants, such as those in the words *aufschluss*, *sprichst*, the Finnic-Tatarian languages are comparatively free from gemination and consonant combination; and they may be said to be altogether unknown in the auslaut of the whole family. In Yurak-Samoyede, and, perhaps, in all dialects of that family, it is doubtful whether true gemination exists.

Absence
or pre-
sence of
certain

The last and most striking differential characteristic of languages is the absence or presence of certain sounds. Thus, Latin wants the aspiratae, the modern Italian the

aspirated sounds *h* and *ch*, so characteristic of German, the Chinese *r*, and the distinction between *tenuis* and *mediæ*. All the Samoyede dialects except the Ostjak want *ch*, and the Tavgy dialect of the same family, *p*. Again, certain sounds predominate in one language and others in another, or one or more languages may have one or more sounds peculiar to them. Thus, in German the dentals *s*, *l*, *n*, *d*, *t*, so predominate as to give a base tone to the whole language: so in the Slavonic languages the palatal sounds.

sounds in
lan-
guages.

If all the languages of the world were coördinated according to the ten categories above enumerated, we would have the elements of a geography of sounds, the results of which would constitute true constants of philological science; but, like the corresponding constants of the experimental sciences, it would require the patient labours of many scholars for a series of years. When completed, however, it would give to philology that character of exactitude which numerical data only can communicate to a science. Every change made in a language could thus be accurately registered from century to century, and a true theory of phonetic modification evolved. These constants could easily be determined for the European languages, and, indeed, for all the Indo-European dialects now existing. But it is to the Russian scholars chiefly we can look for those of the great Northern Family, every member of which is represented within the ample limits of the great Russian Empire. The numerical data which I have used as illustrations are not obviously such as could be employed as tests of hypotheses; those borrowed from Förstemann and Fernow possess, no doubt, considerable accuracy, having been founded upon a close examination of languages which possess rich and varied literatures. My own results are mere approximations, sufficiently accurate for my present purpose, but by no means fit to serve as constants. Indeed, the whole of the foregoing numerical relations have been introduced, not as examples of absolute data, but rather as rough approximations, explanatory of what I understand by the coördination of phonetic peculiarities. It may be worth while, however, to examine how such constants might be employed, did we possess them.

The pho-
netic co-
ördina-
tion of
lan-
guages
would
give phi-
logical
constants.

In my former article⁶ I mentioned the doctrine, which appears to be well founded, that the vowels, *a*, *i*, *u*, are older than the intermediate ones, *e*, *o*. According to

Ethnolo-
gical ar-
gument

⁶ Atlantis, vol. i., p. 60.

from age
of vowels;

from
the rela-
tive pro-
portion
of the
different
kinds of
mutes.

this view, the Sanscrit exhibits the most unchanged form of the Indo-European languages; next in order comes Gothic, then Latin, and lastly Greek. Among Turkish languages Yakutish holds the same relative rank in this respect as the Sanscrit among the others, a result which corresponds exactly with the splendid researches of Böhtlingk from a totally different point of view. An argument may be founded on this circumstance, to prove that those languages in which the vocalization is oldest and purest, have suffered least admixture with foreign elements, and therefore in most cases least displacement. Its application to the Indo-European hypothesis is obvious, and in favour so far of the migration from the east. The following observations show its bearing upon the northern family of languages. One of the great connecting links between the members of the northern family of languages is similarity of phonetic character. The Magyar is considered to belong to that family. Even the rough approximation I have given of the ratio between the different homorganic and homogeneous mutes in the Yakutish and Magyar renders this phonetic affinity strikingly evident. The proportion of palatal sounds, which is very high throughout the family, is nearly the same in both, while the proportion of labials and dentals is less in Magyar, a circumstance which is accounted for by the influence of sibilation, which has diminished the dentals, and also by the preponderance of the labial liquid *m*, especially in the anlaut. The harmony is still more striking, if we compare them by homogeneous categories, for while they agree in the mediæ and aspiratæ, the tenues, which have been those most affected by the increase of sibilants, are less in Magyar in nearly the same proportion as the sibilants are more. This circumstance even removes the difficulty as to the relative number of explosives or mutes, which is extremely high in the Yakutish, as it would seem to show that the primitive Magyar contained as many.

Relation
between
the root
anlaut
and the
id^ea to
be ex-
pressed.

Several philologists have drawn attention to the connection which seems to exist in the Indo-European languages between the manner of sounding the root and the idea to be expressed. Thus, for example, the words, *sucking*, German *saugen*, Old High German *sûkan*, Lat. *sugere*, *succus*; *sup.* Old High German *sûfan*, New High German *saufen*; Sansc. *danta*, Lat. *dens*; Lat. *bucca*, French *bouche*, German *backen*, Eng. *mouth*, Germ. *mund*,



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rippling of waves—of the murmuring of the breeze or the sighing of the wind through the trees, the rustling of leaves, the gurgling of eddies, and so on. And then, again, this rich objective vocabulary would influence the power of subjective expression. Transfer now this people, or a portion of it, to an arid, treeless, waterless steppe, and how rapidly would the character of the language change! While the words expressive of gentle, gliding motion would either lose their original meaning, or become obsolete, a vocabulary would be evolved suited to express violent motion, gusts, blasts, sand hurricanes, broad expansive plains. Again, all the objective and nearly the whole of the subjective words connected with the motion of water, or upon water, of air, through trees, etc., would be lost; the result of such changes would be the increase of mutes and the diminution of liquids and aspirants, besides the still greater changes which would take place in the ratio of the individual letters in consequence of the loss of some classes of words and the preponderance of others.

This is, no doubt, an extreme case; but it is not greater than what we must presume to have actually occurred. It is usually considered that the explosive or mute consonants change into aspirants and liquids, but that the reverse change is very rare. But even though this were universally true, it would be no objection to the supposition just made, that the mutes would increase, inasmuch as it is not assumed that this increase would be by the conversion of aspirants into mutes, but by the increase of words with mute anlauts and the corresponding diminution of spirants. It would be extremely interesting to examine all the known roots in the Indo-European and Semitic languages, as the roots in both are now usually admitted to be the same, and those of the Finnic-Tatarian family, and see whether this supposed objective character of the anlaut really exists in the oldest meanings. A table showing the results of such an analysis would, I am confident, tell us a good deal of the history of each family. Among other things, I am inclined to think that it would show that the northern family of languages are relatively newer than the others above named, and that the roots in that family are in a great many instances produced by compression from words containing other roots originally.

While discussing the effect of change of geographical position, I have not forgotten that most fertile source of

Importance of examining the roots of languages from this point of view.

Effects of fusion,

phonetic change, the gradual adoption by one people of mixture, the language of another, and the mixture and more or conquest. less partial fusion of two or more distinct languages. Nor have I forgotten, that even where no trace of the absorption of a given element, glossarial or grammatical, may be distinguishable, a peculiar sound may remain, which, like the foot-prints observed by geologists upon sandstone, that tell of birds and other creatures that walked upon the shores of a former ocean, may waft to us from past ages the tones of voice of an extinct people. Yet, making all due allowance for these important modifying causes (supposing the objective character of the anlaut established), I think we may admit that the relative proportion between those roots which still retain an objective meaning in harmony with that of the anlaut itself, and those which have *lost* such meaning, will afford a certain measure of the amount of displacement and change to which the language has been submitted.

Hitherto, in speaking of phonetic changes in which natural phenomena shared, I have assumed that there has been no direct agency of physical causes, and that the modifications have occurred from the necessity which exists of altering the vocabulary of a language to suit changes in its orographical, climatal, and other physical circumstances—a change which in turn reacts upon the subjective words of a language. But is this strictly true? Do sounds undergo no direct modification from the action of physical agencies? That the voice is influenced by the climate few will be disposed to doubt; but it has never yet been determined whether such modification extends to an absolute letter change, that is, to a phonetic modification in a philological sense. The obvious progression which has occurred in the vowels of the great branches of the Indo-European family of languages appears to me, however, to point to such a direct action of physical agencies, and accordingly I shall make a few suggestions upon the subject.

Hitherto no direct action of physical causes assumed.

Do physical causes directly act?

Although all the vowels can probably be produced by the same amount of vibration of the vocal chords, the difference in character being produced by variation in the size of the buccal cavity and labial aperture, yet there appears to be a natural tendency to elevate the pitch of the voice in passing from *a* to *i*. This, I think, is perceptible in the circumstance that, in all true diphthongs in which *i* occurs, it is the auslaut, and in all false diph-

Natural tendency to elevate pitch of voice in passing from *a* to *i*.

things containing *i* as an anlaut, the hiatus in pronouncing it is more perceptible than with any other combination, and the pronunciation more difficult to those unaccustomed to modulate the voice. We shall also find, that if we attempt to successively sound words containing the pure sound of *a* in a series of rapidly ascending keys, that the vowel will then tend to be obscured and become a diphthong, or pass completely into *e* and *i*. It would thus appear that the vocalisation of languages may, under certain circumstances, tend upwards to *i*. An example of this kind is presented by modern Greek, and to a certain extent by English. It is probable that this phenomenon is intimately connected with accents. According to Weil and Benloew, "The ancient accentuation was essentially musical; it consisted in the contrast of graver sounds with sharper sounds; in pronouncing a word of several syllables, the voice passed through a gamut of accents".⁸ The peculiar syllabic tone of the Chinese is, perhaps, the older form of accent. In modern European languages the accent has lost this character, at least in cultivated speech, and consists now of a mere intensifying of a certain syllable. A phenomenon, however, which may be viewed as the representative of the ancient form of accent, is still in full vitality, if not among educated men in Europe, at least among the mass of people in every country, being more prominent in some districts than in others. This is that peculiar modulation of the voice which is so characteristic of some districts, and which often amounts to a perfect singsong in speaking.

Ancient accentuation:

a form of it still existing.

Observation of Rapp upon this kind of accent.

Rapp⁹ has pointed out a remarkable circumstance in connection with this form of accent. According to him, the people of central Suabia speak with none, or, at least, with a scarcely perceptible modulation; it appears as if there was there a kind of nodal point, starting from which the modulation began. If we go south from it towards the Alb and the Danube, we immediately perceive a perceptible modulation, a lively, pleasant rise and fall of the voice, which becomes more lively and sprightly as we approach Switzerland, and, as is well known, constitutes one of the most characteristic marks of the Swiss idioms. The chief direction of this modulation is the same as that which lies at the base of the Italian language, and the

⁸ Weil et Benloew. *Théorie Générale de l'accentuation Latine*, p. 15.

⁹ *Versuch einer Physiologie der Sprache*. S. 173.



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moun-
tainous
regions.

mosphere is always in motion, and into which cascades of dense cold air are always pouring, the voice, whether articulated or in singing, must be always undergoing slight modifications in pitch in passing through an atmosphere of varying density and in constant motion, and must consequently produce on the ears of those listening the effect of a distinct modulation; and this modulation must affect the duration of the vowel sounds, and tend to diphthong the pure ones,—changes which of course react upon the consonants. This kind of influence must of course operate more upon those who live a good deal in the open air; and accordingly we find that phonetic changes are more frequent among uncivilized nations than among settled ones, and in mountainous regions than in great extended plains.

Nume-
rous dia-
lects
within a
small
area only
account-
ed for in
this way.

It is only by physical causes of this kind that we can account for the evolution of dialects within extremely limited areas, where isolation, intermixture of foreign elements, and similar disturbing causes, cannot have operated. Take, for example, the Swiss canton of Appenzell, which is not more than twenty-two miles long, and at most ten miles broad, and contains about 50,000 inhabitants; yet within that area at least four chief dialects may be recognized, with many minor varieties; and these differ from each other in so marked a manner that the inhabitants of the heights about Rheineck, who speak what is known as the Kurzenberg dialect, ridicule the speech of the remaining part of the population.¹⁰ Such modifications as I have contemplated here can only take place from the long continued action of the same causes upon generations of men; and, though the cause of change be constant, yet the material operated upon being of different kinds, the results must endlessly vary.

Action of
city life.

City life, too, operates upon the phonetic system of a language after a somewhat similar fashion. Its most striking effect is to sharpen the pronunciation and the upward tendency of the vowels. The prodigious number of sounds passing through the atmosphere of a great city, and which modify each other by interference, necessitates a higher pitch of voice in those who live much in the open air, and consequently a modulation which in turn reacts upon the whole language. I think a careful investigation would show that even the introduction of paving and

¹⁰ Toblers Appenzellischer Sprachschatz, 1837, Vorrede S. xxix. Heyse's Sprachwissenschaft, S. 173.

wheel-carriages has affected the local dialects of Paris and London, and helped especially the progression towards *i*.

§ 2.

The observations which I have made upon the apparent relation between the anlauts of roots and the objects or operations intended to be expressed by the roots themselves, form a natural introduction to the second and more important part of my subject. In my former article I stated the general proposition that all verbs and nouns symbolize either positive material things, qualities, or actions, or did so before they became the symbols of abstract conceptions. Again, that the original stock of roots in a language must consequently have reflected the character of the climate, physical conformation, geological structure, and fauna and flora of the region where it originated. And again, that among the objects for which names were framed would, doubtless, be many whose geographical distribution would be limited, and therefore determinable. In process of time also a language incorporates words from other languages by contact or fusion of the people speaking it with other nations; some of them, too, might be connected with objects having a determinate geographical position. Hence, I assumed that if we could discover a number of such words in every language, they would constitute true ethnological fossils, by means of which we could as unerringly refer a language to its original home, and trace the line of its onward movement, as the geologist determines, by means of the remains of the plants and animals entombed in the rocks forming the external part of the Earth, the relative strati-graphical succession of those rocks.

My proposition does not in any way involve the discussion of the great problem of the origin of ideas. For whether we adopt the Aristotelian philosophy, and consider "the soul as entirely empty, like tabula rasa, and that everything therein traced is derived from the senses and experience"; or with Plato, believe that "the soul originally contains the principles of several notions and doctrines, which external objects only awaken on occasions", the first words must have had such an objective character as that assumed. I therefore merely say that external nature has influenced the mind, and either called forth an idea which did not preëxist, or merely embodied a dormant conception. Humboldt has thus beautifully alluded to

General proposition stated in former article.

This does not involve the doctrine of ideas.

this influence of the sensuous upon the ideal: "For the physical world is reflected with truth and animation on the inner susceptible world of the mind. Whatever marks the character of a landscape: the profile of mountains which in the far and hazy distance bound the horizon; the deep gloom of pine forests; the mountain torrent, which rushes headlong to its fall through overhanging cliffs: all stand alike in an ancient and mysterious communion with the spiritual life of man".¹¹

Names
formed
in each
language
expres-
sive of
the phy-
sical fea-
tures of
the
country.

In Old
Casti-
lian,

Irish,

Russian,

Among rude and uncivilized peoples considerable attention is bestowed upon the forms of mountains, any striking peculiarity in the shape of a jutting crag, remarkable stones, the river courses, climatal changes, or in fact upon any common object which strikes the eye in consequence of some peculiarity; names are invented to express the idea thus called forth by them in the mind. And as these objects serve to characterize the general features of the region in which they occur, the vocabularies of names must therefore necessarily reflect the peculiarities of the region. Humboldt has pointed out that there are at least thirty distinct names in Old Castilian expressive of the varied forms of mountains, and that an equally rich vocabulary has been formed in Arabic to express the different kinds of deserts, according as they may be hard clay ones, or sandy, or interspersed here and there with patches covered with grass or social plants, or covered with an efflorescence of salt, etc. So also we have a rich vocabulary in Irish for the different kinds of hills and mountains, and equally expressive of the outlines of Irish scenery as are those in the Castilian of the Spanish. Again, one of the most striking features of Russia is its general flatness, the absence of high mountains, or even in many provinces of hills of any considerable magnitude; its rivers must consequently exhibit those characteristic forms which distinguish the great rivers flowing through alluvial plains. Another feature is the large number of lakes. Accordingly, these two features of the physical geography of Russia have led to the formation of a multitude of terms which express in a striking manner every peculiarity of rivers and lakes. The latter, for example, receive names which express whether they are free from weeds or fish, etc., or contain sedge or flowering potamogeton and other water plants, or salts, etc.

¹¹ Views of Nature—Cataracts of the Orinoco, p. 154 (Bohn's Ed.)



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If we contrast the names of the months among the Yurak Samoyedes who nomadize in the region forming the boundary of the wooded country and the Tundra, and the Ostjak Samoyedes of the Forest region about the middle Obi and its tributaries, we shall observe how well the different names characterize the climatal relations of each district. One example will, however, suffice. Among the Yurak Samoyedes, the ninth month, corresponding to the end of April and May, is called *Savu yiry*, or flood month, because the lower courses of the great rivers are then flooded,—corresponding to the name for early spring, *sebuä*, among the Yennissei Samoyedes. In the higher regions of the middle Obi, the tenth month of the Ostjaks, corresponding also to May, is called *ütelguezal-ireäd*, that is, month when there is water in the brooks and rivulets.

The impression of individuality produced more by the vegetable covering than by physical outlines.

But although, taken as a whole, the physiognomy of particular regions of the Earth may be characterized by the form of its mountains, the presence of deserts, the number and magnitude of its lakes and rivers, it is, as Humboldt truly observes, the vegetable covering which chiefly conduces to the total impression of individuality which a particular country produces on our minds. Not only are different regions characterized by a preponderance of one or other form of vegetable life, but certain species, genera, or even whole families of plants, may be confined to a very limited area. The same may be said of animals: although from their relatively small mass they do not materially contribute to scenic effect, yet from the great use or injury which they are to mankind, they have perhaps as largely contributed to impress a special character upon some languages as plants.

Subjective words not alluded to in examples.

In the few illustrations which I have given of the influence of physical geography and climate, I have confined myself to mere names of objects or of divisions of time, and have not alluded to the subjective words which are evolved by the impressions of objects upon the mind. Such words are even still better examples of the action of natural phenomena upon language, than even the names of the objects themselves. Many are borrowed from great cosmical phenomena, and others from very local ones, and others again from plants and animals: the latter are more important for my special purpose, and I shall accordingly confine myself to them. The following examples, borrowed from Yakutish, Osmanli, and Samoyede, will serve to show the character of this action:—

Tia, a wood in Yakutish, is evidently the stock upon which the following words have been formed, or at least it contains the same root: *tiass*, noise (rustling of wind in the forest); *tit*, to break; *timit*, a lizard; *tir*, to cut through; *ti*, a boat; *tung*, dense, impassable; *ting*, a squirrel; *tueba*, a thicket. In the Yennissei Samoyede dialects we have *tjoe*, a pine-tree; *tjeje*, a wood; *to'e*, dense. In Osmanli we have *tjale*, a shrub; *tjale koučhou*, a wren; *tjalmak*, to strike, smite, beat, open, efface; *tjalpura*, castagnets: *tjalkatmak*, to stir, agitate, shake, or rince; *tjalelamak*, to surround with thorns; *tjalghe*, sound of a musical instrument, concert, music; *tje'uyer*, a kind of musical instrument; *tjalechkan*, active, laborious, industrious; *tje'up*, wood, a piece of wood; *tje'rgué*, a wooden tent or pavilion; *tjelek*, a tub; *tje'ul*, desert; *tjerne*, a ship; *tje'ktirmé*, *tjektiri*, a small galley, brigantine; *tjil*, wood, gelinotte; *tjera*, resinous wood; *tjit*, a hedge; *tjam aghadje*, a pine-tree.

Again we have *chating*, a birch-tree; *chati*, a notch; *chatiss*, a flat rope or thong; *chatirik*, bark, fish scale; *chatic* or *chatic balik*, the sturgeon. Also *tīt*, a larch-tree; *titirik*, a young larch-tree; *titik*, a summer stall for horned cattle (because made of larch-wood); *titiriæ*, to tremble; *titerec*, to tremble together; *tirech*, *Populus alba*.¹³ As examples of the relations of animals to language, we may instance—*it*, a dog; *it*, to let loose, to run away; *itillara*, to give absolution for sins; *ite*, weeping; *itir*, to bite; *injir*, to gulp; *injī*, to moan as a dog; *itird*, to snuffle, to sneeze. Again, *bil*, *Salmo Taimen*; *buld*, fishing, hunting; *buldtta*, to hunt, to fish; *bilkher*, an acquaintance (that is, some one met with during fishing, etc.); *biliss*, to make an acquaintance. In connection with domestic animals may be given—*ia*, to milk; *iaghass*, a vessel made of birch bark (to hold milk); *iam ija*, milking month—May; *ial*, a neighbour; *ialpit*, a guest.

These examples, taken at random from several hundreds equally appropriate, borrowed from the great northern family of languages, not only illustrate the general principle, that the names of natural objects are the nuclei around which not only other objective words, but also subjective ones, group themselves; but they likewise show that the sequence or connection of ideas which a group of words derived from a common stock exhibits, is characteristic of the country where they were formed, and of the customs and pursuits of the inhabitants at the time of their formation. In proof of this, I would refer particularly, in the foregoing comparisons, to the words derived from *tia*, a wood in Yakutish and Osmanli; in the former the derivatives are not numerous, and are, with one exception, directly connected with a wood; in the Osmanli, on the other hand, we have the evidence of a people having ships, and therefore living near the sea, and most of them have not been formed under the direct influence of contact with forests.

None of the words in the foregoing examples are of so specific a kind as to characterize, in the strict sense of the word, any particular region: It is true that the word

Exam-
ples of
words
derived
from, or
related
to, names
of plants.

What
they il-
lustrate.

None so
specific
as to
charac-

¹³ According to Pallas (Fl. Ross.), *Populus balsamifera* is called *Tyt* in Kamtskadale, a fact of considerable importance.

terize a region.

wood indicates that we are dealing with a country containing trees, and that larch and birch, though applicable to several trees which extend over a very wide geographical area, are yet not found on tropical plains. In this sense, therefore, such words do constitute ethnological fossils, but their relative value as such is analogous to those geological ones which, though confined to the rocks of one epoch, are nevertheless distributed through all its subdivisions. Under certain circumstances, however, generic names, like birch or larch, and even those having still higher meaning, may possess the value of a specific name, and thus serve to define a limited area, although its real geographical distribution may be much more extensive. I shall illustrate this by an example borrowed from the Turkish languages:—

In some cases generic names may possess specific value.

Example.

The word *ot*, in Yakutish, signifies grass; from it are derived *ot ija*, grass month, which is July or June, according to relative position, being the former in the colder regions, where the spring is late; *ottō*, *otu ottō*, to make hay; *oton*, a berry; *oton uba*, the flower-stalk of grass; *otū*, an encampment, a place for encamping, a place of refuge; *ötöch*, the place where a house formerly stood. In Osmanli we have—*ot*, herbs; *otlouk*, a prairie; *otlou*, full of herbs; *otlanmak*, a shepherd; *oraklamak*, grass mower; *orak*, scythe; *ot*, poison; *otarmak*, to poison; *otak*, *otagh*, the royal tent.

Again, we have another form of *otū*, an encampment, in Yakutish, namely, *ordū* (Osmanli, *ordou*, and in most Turkish dialects, *ordu* or *ordou*—hence the word *Horde*), in connection with which we have *ordūlan* (Osmanli, *ordou kourmak*), to encamp, to fix oneself; *ord*, to remain over, to remain behind (also the burning of a meadow or wood, which seems thus to link *ot*, grass, and *uot*, fire—Osmanli, *od*); *orduk*, rest, also superfluous (that is, remaining over), therefore more, greater, better; *oron*, a bank against the side of the jurte or hut for sleeping, a stool, a bed (hence, Osmanli, *oranitja*, a long and narrow Danube boat); *oroch*, a foot-path, a path, that is, to the encampment (Osmanli, *ormanda*); *oroghoss*, to go one after another.

Original seat of Turkish race.

The original seat of the Turkish race is placed with considerable probability on the high table-lands of Asia, between Lake Dzaisang and the frontiers of China, and between the Altai and the chain of the Thian-Schan—a region of forests and Steppes, whose peculiar character and the habits of life which it necessitates must necessarily produce a deep impression upon the minds of its inhabitants. Humboldt, who visited the Asiatic Steppes as far as the western limits we have assigned the Turkish race, says: “The vegetation of the Asiatic steppes, which are sometimes interspersed with pine forests, is in its groupings far more varied than that of the Llanos and the Pampas of Caracas and Buenos Ayres. The more beautiful portions of the plains inhabited by Asiatic pastoral tribes are

Steppe vegetation described.



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Significa- ing, in most of the Turkish dialects, including the Osmanli:
tion of *ot*. There is a distinct word for grass, which, being two-sylla-
bled, is probably newer than *ot*; at all events it does not
appear to have been preserved in Yakutish, if indeed it be
not younger than the separation of that nation from the
parent stock. As we have seen from Humboldt's descrip-
tion, the predominant vegetables on the Steppes do not
belong to the Graminaceæ; but on the alluvial flat lands
and islands of the Lena, etc., the vegetable covering may
be described as grass; hence, in Yakutish *ot* signifies grass.
Again, Yakutish appears to have lost the special word for
shepherd. The Osmanli has retained it; for although the
European Turk has ceased to nomadise, the cultivation of
sheep is still maintained among settled and civilized na-
tions. The preservation of the primitive meaning of *ot*
as herb, of course accounts for why in Osmanli it signifies
poison also. The Yakutish word *otū*, an encampment, is
singularly characteristic of nomadic life, being formed from
the words *ot*, grass, and *ū*, water, the chief requisites for a
proper site to encamp upon. The nomade has, therefore,
retained the word in its strict original meaning. The
Osmanli has also preserved the word in the form of *otagh*,
but has given to it a new signification. It has thus travelled,
like a boulder rolled along by the waves, with the invading
hordes of nomades become warriors. The royal tent being
the centre of the encampment of the army, naturally became
synonymous with the place itself, and *otagh* now means
royal tent. In this way the military use of a word has
preserved it after it had lost its nomadic meaning. Such
a word is a true ethnological fossil, which unerringly leads
us back to the original home in the steppes from whence
we can historically trace the Osmanli. The word, with
an intermediate signification, has been retained among
some of the nomadic tribes, who got mixed up with the
military expeditions of the Turks; thus in Buryät, *otek*, or
otok, means a place of refuge; it has this meaning some-
times also in Yakutish.

The word
otū an
ethnolo-
gical fos-
sil.

Words
from
same
root
often ex-
press un-
connect-
ed ideas.

The other words mentioned among those related to *ot*
will serve to show how little apparent connection may
exist between the ideas expressed by a series of words,
although originally derived from the same root. At first
sight there certainly appears to be no connection between
a long Danube boat and a bed, but if we recollect the
shape of the plank that constitutes the bank or bed in a
Yakutish hut, we shall find the idea natural enough.

I have selected *ot* as a type of a certain class of fossils, because we know historically whence the Turks have come, and because we can logically follow its change of meaning, and can therefore verify any conclusions which we may deduce from a study of the word. But as our object is to employ such words in unravelling the history of races, it is obvious that, although those having so general a meaning as herb or grass may, under peculiar circumstances, be employed for such purposes, we must seek for more specific words, names of definite objects, which only exist in certain localities, and in no other. Before proceeding with my investigation in this direction, I must make some brief observations upon the classification of affinities, and upon the kind of words which bear migration.

Why *ot* has been selected, and why we must seek for another class of words.

If a naturalist included the ox and the goat in the same genus, because they had eyes, were covered with hair, had four legs, a tail, and generally two horns, he would not depart more from the principles of a true natural classification, than do many ethnologists in their classification of languages. Either classification is useful or not. If it be, then such relative affinities as would in natural history be represented by class, order, and genus, ought to be observed. Yet, in some very recent works it has been sought to extend the limit of the Indo-European family at the risk of confounding class, order, tribe, and genus together. What is therefore most wanting in ethnology, as a whole, and especially in philology, is a natural system of classification of affinities, which would enable us to successively separate in a language those words: 1. which it has in common with all others, that is its remotest affinities; 2. those which it holds in common with a certain number of languages forming a family, or first branching off from the primitive stock; 3. those which it holds in common with a subdivision of the primitive branch, and so on; 4. and, lastly, those words which it has picked up by fusion or contact with other races; the elimination of the latter being necessary before the others could be determined.

Comparative values of affinities.

The difficulties attendant upon the comparative analysis of a number of languages, are very numerous and embarrassing. There is, first, that arising from the number of words compared not being sufficient; then that attendant upon the determination of the correct laws of letter changes, which, it is unnecessary to remark, must be determined inductively, and not by *a priori* reasoning. Another source of difficulty arises from the peculiar

Difficulties of philological analysis.

Example
of confu-
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names
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Alter-
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Words
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Polysyl-
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Those
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idiosyncrasies of different peoples, which lead them to give names to the same phenomena under the influence of totally different impressions. Fusion, contact, etc., of different races produce a confusion of names constituting another difficulty. This confusion is not confined alone to the effects of contact of two languages, but may even occur in the same language, in consequence of simple displacement. A good example of this confusion is afforded by the Russian emigrants in Siberia; they apply the same term *sniegiri* = *Emberiza nivalis*, or snow-bunting, both to that bird and the *Pyrrhula rubicilla*, or bullfinch, because the latter lives in society with the former during the winter. The Yakuts, on the other hand, although in contact with the Russians, have distinct names for the two birds. This kind of confusion is not the only difficulty, however, which arises from displacement, or contact or fusion with other races having different phonetic systems, nor, indeed, is it the chief. Words are contracted, altered in sound, new compounds formed out of the contracted words, which may in turn be similarly modified. We may liken a language thus treated to a geological conglomerate composed of broken or rolled fragments of various rocks cemented together, the original character of the fragments being sometimes recognizable, sometimes not. We do not know how far this wearing action may have proceeded in some languages, and, consequently, what we often assume to be roots, may be nothing more than united fragments of other roots. French affords admirable examples of these kinds of philological conglomerates, which are the more illustrative, because we can historically trace their formation. Who could find *dîner* in the middle Latin *disjejunare*, *même* in *met-ipsissimus*, *peu* in *paucus*, or the Provençal *ebra* in Latin *Hedera*, the Albanian *μπερ* in Latin *Imperator*?

We see from the foregoing that many-syllabled words are liable to suffer great modifications in process of time, when subjected to displacement and other modifying influences. All words are not, therefore, equally adapted to bear migration. Long compound words are naturally least adapted for that purpose. This inability to bear transportation naturally unfits such words for serving the function of ethnological fossils. Hence, we have to seek for a class of words that will be simple, that is, not many-syllabled, of such common use as not to be readily forgotten, and yet expressive of objects which are essen-



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category. Most of those names have now, however, lost their original specific signification, and have acquired a generic one. Thus, hazel might be applied with equal correctness to *Corylus Avellana*, *C. tubulosa*, or *C. columna*; so also, the word oak to any of the numerous species of *Quercus*. This is the very difficulty to which I have already alluded in the case of the names birch and larch. This circumstance naturally reduces the number of words available for the purpose I have in view. We shall see hereafter that there are ways in which this difficulty may be met, and the original specific signification of words which have now generic meanings, sometimes detected.

But besides, the names of the plants and animals themselves, we have to consider the words which have been founded upon them, and expressive either of objects connected with the plants, or of ideas which have been suggested by them. I have already given examples of this class of words. If a people whose language has been enriched by appropriate words, expressive of natural phenomena, animals or plants, or abstract ideas suggested by them, emigrates, or be driven out of its original area, the new country may contain very few, or none at all, of the objects represented by the words of that people's language. If a few objects are found to be common to the original and new country, the primitive names will, of course, be applied to them; the remainder must be provided with new names. Should any of these resemble, in a striking way, some of the objects left behind, the names of the latter will be applied to them either simply or with a qualification. The perfectly new objects having no analogies among those of the mother country, would have new names coined for them out of words already existing in the language, but which may themselves have been derived in the first instance from the names of objects at some remote period in the history of the language. Under the new circumstances we would therefore have: 1. names still applied to the original objects signified; 2. names originally given to different objects, but now applied without change to some new ones; 3. names originally given to different objects, but now applied to new ones, but with certain qualifications; 4. new names consisting of combinations of words preëxisting in the language, but coined for the first time; and, 5. the names given by the aboriginal inhabitants of the new region, some words of whose language would become

The words derived from plant-names, etc., to be yet considered.

Effect of migration, etc., upon natural history names and their derivatives.

incorporated, even though their state of civilization may be such that no true fusion of the two races could take place. The whole of these changes may be seen in progress in Australia; its fauna and flora are, however, so peculiar, that scarcely a single species of plant or animal, unless those introduced, are common to Europe. The latter retain, of course, their English names; the second category would be represented by *Porcupine* (genus *Echidna*, instead of the European one, *Hystrix*, *Lin.*), *thrush* (genus *Grallina*, *Vieil.*, instead of the European one, *Merula*, *Ray.*), *Robin* (genus *Petroica*, *Sw.*, instead of the European one *Erythaca*, *Sw.*), etc.; 3. by *Green Dove* (*Ptilinopus*, *Sw.*), *Helmet Goose* (*Ceriopsis*, *Lath.*); 4. by *Duckbill* (*Ornithorhynchus*), *Hairtail* (*Dasyurus*), etc.; and, 5. by *Kangaroo*, *Koala*, *Jabiru*, etc.

Australia an example of this.

The words expressing abstract ideas, etc., derived from the names of objects lost, would still continue in the language, notwithstanding the disappearance of the stock-word; some might, however, be lost, others modified, the meanings changed, or they may become the stocks of new words. If we suppose further, that instead of the displacement of the whole race, only a part was displaced, and that the remainder continued to occupy the original area, the whole of the primitive names would be found in its language, both those applied to the objects common to the new and old areas, those which were applied to new objects by the displaced part of the race, and those which died out in the language of the latter. The names of plants and animals retained in the new region, and the derivatives from those of the plants peculiar to the original seat, would be true ethnological fossils, provided we had a complete comparative vocabulary of the names of plants and animals in all, or the greater number of surrounding languages, and of the words founded upon them.

Subjective words remain after loss of objective.

Contrast between the languages of a race that have migrated and the undisturbed parent one.

The names of plants and animals picked up in the course of the migration, would point out the line of route, and the relative duration of the occupancy of any intermediate region might often be measured by the effect which its peculiarities may have exerted upon the language.

Words picked up by the way mark the route.

The examples which I propose to give in illustration of the views laid down in the foregoing, will consist—
1. of some specific names of plants or animals, in two or more closely allied languages, with the view of determining where they originated, and, therefore, the point of departure of the races in whose languages the words

Examples of preceding views.

occur; the animals or plants being assumed not to be cultivated, and therefore not liable to be transported into distant countries, carrying with them their name: 2. examples of the use which might sometimes be made of the names of domesticated animals and cultivated plants, in order to test whether a migration had or had not taken place: 3. manner of employing a word having now only a generic meaning, but the primitive or specific meaning of which may be established, or may be so definite that it would possess a specific value in testing ethnological hypotheses: 4. and, lastly, an example of the complete analysis of a language the origin of which is doubtful or unknown.

1. Showing how the name of a plant or animal, occurring in several languages, may be traced to its first home.

1. *Anas erythropus* is called by the Kasan Tatars *karakas*, but in Yakutish it is called *liglik*. In Osmanli the word *laklak* or *leylek* is applied to stork; while, in the Turkish languages of the Caucasus the name of stork is *leglek* or *legleg*. In Osmanli also, the ibis is called *kare laklak*. The majority of the Turkish dialects agree with the Osmanli, whereas those of them spoken within the geographical range of the *A. erythropus* have a different name for that bird. We may legitimately conclude, therefore, that the Turks of the Steppes have preserved the original name, while the Yakuts, migrating northwards, carried the name with them, but applied it to a different bird.

Again, *Grus leucogeranus*, or the white stork, is called in Yakutish *kitalik*; in Osmanli, *Tetrao tetrax* is called *keklik*; this is also the case in the dialects about the Volga, etc. The Bucharian partridge, which is found in the Eastern Kirgis and Dzungarian Steppes and in Buchara, is called by the Turks of those regions *keklik* or *kakelik*; whence the specific name, given by Gmelin to this bird, of *Tetrao kakelik*. We have, therefore, three birds to which the name is now given. To which of them was it originally applied? One or two circumstances seem to determine this point with considerable accuracy. The *Tetrao kakelik* is said to cry out continually, *kakelik!* and then, if other partridges make a similar cry, there is a sufficient reason for this one monopolizing the name, as it has always attracted attention by its beauty; it is, indeed, on this account kept in cages in Buchara. We may therefore safely conclude that the name started from the central Steppes, and was applied by the migratory tribes northwards and westwards, to different birds which resembled it or cried like it. We could scarcely have a better example of what I call ethnological fossils than this.



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arg,¹⁶ etc. It may be worth remarking here, that the words for riches in most of the Turkish dialects appear to be connected with sheep. Thus, in Osmanli, *ghani*, pl. *agniya*=riches; *ghani itmak*, to enrich; Koibal and Karagass, *bai*; Yakut, *bāi*; Soyot, *pai*. There is also a curious coincidence, if it be nothing more, namely, that while in the Finnish (Karel.) *geinamaurmi*, is a meadow, and *öinas*, a sheep, the Estonian for meadow is *öinama* or *geinama*. Is there any relation between French *gagner*, English *gain*; old Norse, Swed. *gagn*=utilitas commodum, and the names of sheep or lamb?

If the foregoing comparisons be correct, almost every form in which the names for lamb and sheep have appeared in Europe, may be found in the Asiatic languages, but especially in the Finnic-Tatarian ones. The coincidence of the names, too, is more remarkable in Central Asia, which is usually considered as the native country of the wild sheep. But even if we admit that the wild sheep was once indigenous to Europe as well as to Asia, we must also admit that in Asia was the country of its domestication. This being so, the animal, together with his names, were introduced into Europe by one of two ways: 1. either by migrating nations bringing it with them; 2. or by commerce. If we accept the eastern origin of the European nations in the terms of the Indo-European hypothesis, the sheep might have been brought with them. This hypothesis would satisfactorily account for the existence of several names in Europe for the same animal, identical with the Asiatic ones. If, on the other hand, we deny such migration, as Latham seems inclined to do, the sheep must have come into Europe by different routes, for otherwise we could not account for the variety of names. But as some languages have several words to express sheep or lamb, etc., as for example, Latin, *agnus* and *ovis*, and as these names appear to belong to two different parts of Asia, it appears to me that we should admit that the sheep came into Italy by two different routes. As I am only illustrating a method, and not investigating this particular problem, I shall not attempt to decide between the two views. It is evident, however, that this mode of making the investigation would lead to interesting results.

3. Determination of the specific meaning of a word having

3. My next example is intended to illustrate the use which might be made of a word having now a generic meaning in many languages, but whose specific meaning may be detected and used with advantage as a fossil. I shall first give the glossarial comparisons, and then deduce from them my conclusions.

¹⁶ Evidently the Mongolian *argal*, or *ovis argali*.

Generic.

TREE.—Sanskrit *Druh*, *druma*, *drumas*=shrub; Zend, *dru*; Greek, *δρυμός*, forest of oaks, a forest; Gothic, *triu*; Old Saxon, *trio*, *treeo*; English, *tree*; Persian, *dirakht*; Russian, *derevo*, *drevo*; Armenian, *dzarh*, *trachd*=tree, garden. now a generic one, and how it may be used as a fossil.

WOOD.—Irish *ṽoirne*, *ṽairne*—an oak wood; Kymric, *dervus* or *der*.

TIMBER.—Sanskrit, *dāru*; Albanian, *dru*, *dhria*=vine stock; Lithuanian, *derva*=pine wood; Russian, *drovà*; Polish, *drva*=firewood.

Specific.

OAK.—Greek, *δρῦς*; Irish, *ṽair ṽuir*, *ṽair-magh*, an oak plain, which is the Zend form with only the interchange of *u* and *r*; Kymric, Cornish, *Dār*, *derv*, *derô*; Russian, *dubi*?

Subjective.

Sanskrit, *drih*, *crescere*, *augeri*; *driddhi*, *firmus*; *dirgha*, *longus*. Zend, *deregh*, *derez*, *crescere*, to spread abroad by language; *daragha*, *longus*; *drâjanh*, *longitudo*; *dareza*, *solid*; *derezâna*, *usura*; *drvaçna*, *belonging to wood*; Keltic, Kymric, *dur*, *hardened by fire—steel*; *durawl*, *steely, dense, hard*; *durfin*, *dense, hard, close*; Breton, *dîr*, *steel*; Kymric, *devr*, *strong, valiant*; *drûd*, *strong, strenuous, bold*.

Latin, *durus*; middle Latin, *drusus*, *patiens, rigidus, contumax*; old French, *dru* (derived, according to Dietz, from *durus*).

German, *dauern*, to last; *dauerhaft*, *durability*.

Greek, *δάσος*, *δρασὺς*, *durus*.

Albanian, *dhras*, to make thick; *dhras*, *thick*.

Lithuanian, *drûtas*, *solid, strong*.

All the preceding words will, I think, be generally admitted to be derived from the same root, which is most nearly represented by *dru*. Etymologists are in the habit of referring nouns to verbal roots, and hence would consider that the verbal form *drih* preceded the noun *druh*. But the idea of the object tree must assuredly have preceded that of growth, the latter being one of considerable generality, requiring much time to realize it, and consequently not to be at all confounded with the ideas of motion in space, which may be verbal from their origin. That the original signification may be nominal is, I think, proved by the circumstance that in languages whose grammar is very imperfectly developed, such as the Samoyede dialects, a noun may be either a verbal or nominal stock, and may, consequently, be sometimes declined or conjugated. The word *druh*=tree, expresses a generic idea, and must have had a specific one before acquiring it; that is, it must have been applied to some particular tree first. All travellers bear testimony to the fact, that specific names precede generic ones among uncultivated nations; moreover, that the existence of any generic or collective names may be considered as a step towards civilization. On this subject I may be permitted to quote the words of the distinguished and lamented Castrèn, than whom no modern, and perhaps no traveller of any period, had more opportunities of forming a correct

opinion. He says: "Rude and uncultivated people have generally no expressions for the most every-day abstract conceptions. There are nations who have no name for river, but have one, however, for each individual river; no name for finger, but have one for the thumb, the fore-finger, etc.; none for berry, but for cranberry, cloudberry, bilberry; not even for tree, but yet for birch, fir, bird, cherry", etc.¹⁷

Out of the above words the only ones strictly applied to special trees express oak: this is the case in Greek and in the Keltic languages: there being room for doubt about the Russian, I shall leave it out of consideration. According to the Indo-European hypothesis, as laid down in my former article, the Keltic migration should have preceded the Greek. Now, if *druh* meant tree generally, how does it happen that two distinct tribes, successively departing from a common centre at long intervals of time, should have applied the word to designate the same kind of tree? Subsequent contact of these races might be suggested; but such contact should include the two great divisions of the Kelts, and should therefore be carried back beyond the dawn of history. But we have yet to take into account the subjective expressions derived from the word *druh*, or some equivalent word. The connection of the ideas, hard, solid, firm, strong, rigid, close, durable, and hence strenuous, bold, and steel, with oak, are so obvious, that in most languages such expressions as "solid as oak, firm as oak", etc., are in daily use. There is not the same evident connection with every other tree; we do not say "hard as poplar", etc. Then, also, Pott refers Latin *durus* to $\delta\rho\upsilon\varsigma$; but if we admit this, we must equally admit the whole chain of subjective words given above. Zend scholars derive *dareza*, solid, from *derez* (Sanskrit, *drih*) to grow, and *daregha* (Sanskrit, *dîrgha*), long, from *deregh* (Sanskrit, *drih*), to grow, which is unquestionably related to *druh*.

The apparent conclusion deducible from the foregoing is, that *druh* was originally applied to the oak,¹⁸ and that,

¹⁷ Vorlesungen über die Finnische mythologie, S. 11.

¹⁸ This conclusion is not affected by the circumstance that the Chinese for tree is *shu*, and the Chaldaic *dir*, and that many other languages, not connected with the Indo-European ones, exhibit like affinities; because attaching a specific meaning to the form *druh* does not imply that a still more primitive form, from which it, as well as the Chinese and others, were derived, might not have meant, in other regions, olive or any other tree. The examples given above of the transfer of names is instructive in such cases. Here too we see the importance of establishing, as the basis of all investigations, correct views as to the relative values of affinities.



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considered as the direct descendants of the Pelasgians, were called βαλανηφάγοι, and the oak, φηγός, esculus. It was dedicated to Zeus, or Jupiter, and hence the name Phegonæus given to him. There are several oaks in Greece with edible acorns, as for example Quercus Æsculus, *Lin.*, Q. Ballota, *Desf.*, Q. Ægilops, or the Valonia oak. The acorns of the first two are very mild, and are still eaten in Southern Europe and North Africa. Unger considers that it was the Valonia oak, the most common of all in Greece, and which is now only useful for the tanning material of its cusps, which, under the name of φηγός, was so celebrated in ancient Greece. It was it which formed the grove of Dodona in Epirus, in which was a temple to Jupiter and a famous oracle.²¹ If the Father of the Gods was besought under a sacred oak, and heard the prayer, the leaves rustled, though not moved by any breeze. The ancients believed that Zeus resided in the oak, and, as Creuzer observes, they imagined the rustling of the leaves to be voices of birds from his eyebrows, which thus indicated his presence. According to Grimm, the acorn was called among the Romans *Juglans*, *i. e.*, Joviglans.²² Statues and idols were generally cut in oak at the most remote times, and are found crowned with oak leaves. Hercules also received this honour; for the oak was considered, with justice, as a symbol of *life, of strength and bravery*.²³ Whoever saved the life of a Roman citizen by his individual efforts, received, as the reward of his trouble, the civic crown of oak leaves. On a Herculaneum picture, Victoria is represented with a crown of oak leaves in the right hand, and in the left a shield.²⁴ The statue of Cybele was also crowned with oak leaves, evidently betokening the nourishing qualities of the acorns. Hecate also occurs with a similar ornament. Among the Slaves, too, the oak was dedicated to

²¹ I have not seen the original memoir of Unger, but there is an admirable epitome of his results contained in a series of notices by M. Ed. Martens, under the title of "Les Plantes connues des Anciens", in the *Revue de l'Instruction Publique en Belgique* for February, April, August, and November, 1858.

²² *Deutsche Mythologie*, i. 155, 156. The name *Juglans* was also given to the walnut, which it still retains in botany, but as Pliny appears to think it a very recent introduction into Italy, the name must have been transferred to it. It is, perhaps, owing to some confusion of this kind that Unger considers it to have been known in Italy as early as the period of the kings.

²³ Dierbach's *Flora Mythologica*, S. 26.

²⁴ Winckelmann.

Perun, their thunder god. The ancient Prussians considered that their gods lived in trees, especially the oak and linden. The Bohemians also considered that they were the seats of the gods, the latter being supposed to assume the shape of this tree, in order to become visible among men. Mone²⁵ even suggests a relation between the Slavish name of oak (Russian, *Dubi*) and the Keltic name of god (Irish, *Dia*); but this is obviously Zeus, Deus. The oak was also sacred among the Germans and Scandinavians, and apparently a symbol of strength and courage. Perhaps it is on this account that many German soldiers, when marching, wear an oak leaf in their caps. It was also one of the sacred trees of the Gauls, and traces of the ancient feeling may even still be found in Maine and Anjou. Without oak branches the druids performed no worship; oak woods were their residences; under them were placed their judgment-seats.

I have gone thus minutely into the mythological traditions connected with the oak, in order to show that it has really enjoyed from the remotest antiquity that preëminence which I have assumed for it in the foregoing argument. These traditions, too, point to a region abounding in oak forests as the home of the primitive race, from which the European branches have sprung. The Indo-European hypothesis makes the Belur or Bolor mountains that home, and if the information which we possess about the region be correct, it cannot be described as a country of oak forests, or indeed as a country which in any respect could be the cradle of a highly subjective language. Perhaps the only region in the world which would completely answer all the requirements of the case, is the coast-land of Ghlian, at both sides of the Kisilusen, stretching from Khorasan to the high lands of Azerbaijan and Armenia,—a beautiful region, covered with immense forests of oak, beech, walnut, etc. There too the fig, the orange, and peach thrive. It contains the chain of Alburz, the highest peak of which, Demavend, is considered by many to be the mountain of mountains, Albordj, of the ancient Zend cosmogony. Whatever may be the value of the foregoing argument, it is singular that it places the cradle of the European nations in the very region where religious traditions place that of mankind.

²⁵ Geschichte des Heidenthums in Nördlichen Europa (being a continuation of Creuzer's Symbolik), i. 169.

To assume that the Arians went eastward from the oak region of Europe would account for many things; but, as in the case of the sheep, it is beset with almost insurmountable difficulties. For my present purpose it is, however, unnecessary to go further into the subject, which I have far from exhausted.

4. It is needless to observe that, as a general rule, no conclusions as to the origin of a race or the direction of a migration could be founded upon the results obtained from the discussion of the name of a single plant or animal, or even several. Nothing short of a complete analysis of the names of all the plants and animals existing in a language, would be of utility in ethnological investigations. It is true that there may exist some words which would possess, as ethnological fossils, the same relative value as the remains of some few particular plants or animals are known to possess as geological ones, their existence in a rock being considered conclusive evidence of the age of that rock. But even in such cases this kind of fossil evidence is only used to complete the argument, all other evidence having been first discussed. Having shown by the examples 1, 2, and 3, how different kinds of names may be individually investigated, I now propose to show how those of a whole language may be treated. For this purpose I will select the Magyar or Hungarian, because it affords an excellent example of an unclassed language, for although it is usually considered to be a member of the Finnic-Tatarian family, its affinities are not yet well established, and we know nothing absolutely certain of the particular country from whence the Magyars came before making their appearance upon the Volga.

From all sources available to me, I have made a list of about four hundred Magyar names of plants, and between two and three hundred of those of animals. Following Dankowsky and others, who are considered as authorities upon the etymology of the language, I must consider about two hundred and seventy of those names as directly borrowed from the Slavonian, Greek, Latin, Daco-Roman, German, etc., or formed out of words belonging chiefly to the Slavonic or Greek languages. As I am merely illustrating a method of investigation, I will not enter into the correctness of this relative proportion between borrowed and primitive names, and will accordingly assume it to be correct. I may, however, observe that many of the words, considered to be borrowed, are not so in reality.

4. Example showing how a complete analysis may be made of a language, the origin of which unknown



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Names of Plants which existed in the Magyar Language before the arrival of the Magyars in Hungary.

MAGYAR NAMES.	BOTANICAL NAMES.	GEOGRAPHICAL DISTRIBUTION.
<i>Specific Names.</i>		
Alakor .	Triticum Spelta .	Cultivated plant.
Alma .	Pyrus Malus .	South Russia, Caucasus, P. Sieversiana in the Alatau, and perhaps eastwards to Gobi.
Baraboly .	Chærophyllum bulbosum	Russia, Siberia, to the Irtysh.
Dutkóró .	Melilotus officinalis	Russia, Siberia.
Gálna .	Pulmonaria officinalis	Russia, Caucasus, Siberia.
Gordon .	Carthamus tinctoria	Caucasus (perhaps not found indigenous elsewhere).
Görvelyfü .	Scrophularia nodosa	Russia, Siberia to the Yennissei.
Hárs, Hás, also Száldok or Szádok	Tilia Europæa .	Volga, Don, and Siberia sparingly to the Tobol, but apparently not at all east of Irtysh.
Körösfa .	Fraxinus Excelsior	Russia, according to Herman in Siberia to Tobolsk, according to others not at all in Siberia.
Körtvély .	Pyrus communis .	Russia to 50° N. lat., but no doubt introduced; indigenous to Caucasus, etc.
Kotyó .	Prunus domestica .	Caucasus, Tauridia (perhaps introduced); stated also to occur in the mountains about the sources of the Irtysh, but more probably another species.
Magyalfa .	Ilex Aquifolium .	Apparently not found in Siberia, but occurs in the Caucasus.
Medgy .	Armeniaca vulgaris	Indigenous to the Caucasus.
Mogyoró .	Coryllus Avellana .	Not found in Siberia.
Nád .	Phragmites communis	Europe, Aral Sea, Kirgis Steppes.
Papits .	Anemone sylvestris	The whole of temperate Siberia.
Pimpó	Potentilla anserina	As far as the Lena.
	Sonchus oleraceus .	Probably in Siberia, and S Sibericus and Tataricus are mentioned as occurring from the Volga to China.
Putnokfü .	Mentha Pulegium .	Tauridia, Caucasus, Altai, M. arvensis, <i>Lin.</i> , on Kirgis Steppes.
Repkény .	Hedera Helix .	South Russia, Caucasus, does not bear the cold of St. Petersburg, apparently not found east of Volga.
Sikkantyú .	Scabiosa succisa .	Russia, from the Ural to the Tom, etc.
Sulyom .	Trapa natans .	Abundant on Lower Volga, where the nuts are taken up in immense quantities with nets, and sold cheap; Siberia, in Kolyvan Lakes, etc.

MAGYAR NAMES.	BOTANICAL NAMES.	GEOGRAPHICAL DISTRIBUTION.
Süly . Szulák .	Arum maculatum . Clematis Vitalba .	Caucasus (Terek), Tauridia. Tauridia, on the Terek, etc., C. Orientalis, <i>Lin.</i> , coast of the Aral Sea, etc.
Szölő . Szulok .	Vitis vinifera (the grapes of) Lonicera Caprifolium .	Said to be a native of Caucasus and Armenia, cultivated on Volga. S. Russia, Caucasus; only a garden plant in N. Russia; many other species in Altai; L. Tatarica, <i>Lin.</i> , on Kirgis Steppes.
Ternyefü .	Alyssum incanum .	Volga, Terek, Don; said to be found at Irkutsk; A. minimum, <i>Willd.</i> , Kirgis Steppes.
Torma .	CochleariaArmoracia .	South Russia, Siberia, Tobol, Irtysh, Lena.
Torsika .	Ranunculus sceleratus	Russia, Siberia.
Tsenkesz .	Bromus secalinus	Russia, Siberia, about the Irtysh; B. squarrosus, <i>Lin.</i> , Kirgis Steppes.
Tseperkê Tsermolya .	Agaricus campestris Melampyrum arvense	Russia to 62° N. lat., Kirgis Steppes, etc.
Tsitsóka .	Helianthus tuberosus	Polish provinces of Russia; I have not seen it noticed east of Volga.
Tsunya .	Lathyrus tuberosus	Russia, Volga, Siberia to Yennissei, Kirgis Steppes.
Zanót .	Ononis spinosa .	Terek, Don, Kirgis Steppes, etc.
<i>Generic Names.</i>		
Arpa . . .	Hordeum . . .	} Cultivated plants.
Borsó . . .	Pisum . . .	
Börök . . .	Cicuta . . .	
Füz . . .	Salix . . .	
Gódirtz .	Chelidonium .	Several species on Don, Volga, etc.
Her, Here .	Trifolium	
Hinár .	Algae	
Húnyor, Páponya, Zászpa	Helleborus	
Káka, Tsuhú	Juncus	
Kender .	Cannabis . . .	Growing wild on Volga; grown in Siberia to N. Lat. 55°, and in Ural, etc.
Kotsord .	Athamanta .	Most species found in Siberia. A. Libanotis and A. Oreoselinum on Volga.
Kökörts .	Anemone . . .	Species found in Siberia.
Nyir .	Betula . . .	B. fruticosa, etc., in the Altai, Lake Baikal, etc.
Östör .	Chenopodium .	Nearly all the species found on salt Steppes, etc.
Pipitér .	Anthemis .	A. nobilis in the Kirgis Steppes, etc. A. tinctoria—Siberia, the Steppes, etc.

MAGYAR NAMES.	BOTANICAL NAMES.	GEOGRAPHICAL DISTRIBUTION.
Som	Cornus	C. sanguinea, Volga, Ural, Siberia, Georgia, etc. C. mascula—Terek, New Russia, etc. C. alba and C. suecica—Siberia.
Szederj	Morus	
Szil	Ulmus	
Tölgy	Quercus (pedunculata?)	Cultivated in Khanate of Chiva, on the Terek, and a native of Armenia, etc. U. laevis, not beyond the Ural; U. campestris, in Siberia sparingly; U. effusa, Lower Volga. U. pumila, Ural, but not again until L. Baikal.
Tsalán	Urtica (dioica?)	Not beyond the Volga and Ural.
Tsáté	Schoenus	Russia and Siberia.
Tsiggenye	Rosa canina (bacca)	Several species in Siberia.
Zagyva	Carex	

All these plants indigenous to some part between the Danube and Lake Baikal;

would have been known to Magyars if from Bashkir country.

If from E. Asia, they could not know those peculiar to Europe.

A glance at the foregoing list shows us that every plant named in it is either indigenous to, or cultivated in some part of, the region lying between the Danube and beyond Lake Baikal, including Middle and South Russia, the northern declivities of the Caucasus, the Ural, and the portion of Asia north of the Thian Shan, and about the Altai, including the sources and upper courses of the Irtysh, Obi, Yennissei, Lena, and Amur. The distribution of some appears to be coëxtensive with the whole region, while others are confined to the European or Caucasian portions of it. If the Magyars have come from the country about the sources of the Tobol, the Ufa, and the Ural, south and south-east of Yekaterinburg, that is, the country occupied at present by the Bashkirs, nearly all the plants in the list may have been known to them, and it is therefore probable that all the names would belong to their own language. If, on the other hand, they have descended from the eastern table land of Asia, they could not have brought names for those plants whose range does not go beyond the Ural; and if any such plants be found with primitive Magyar names, they must be the names of plants resembling them, which occur in Asia but not in Europe, and which were transferred to them on the Magyars meeting them for the first time. As a general rule, however, the direct transfer of names in this way would prove either that the migration from the ori-



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then only sparingly, and wholly disappears beyond the Irtysh, according to Bode.²⁶ The linden is wholly absent from the government of Astrakan; nor does it appear to occur in the region eastward of the river Ural and south of the sources of the Tobol, that is in the region by which the Magyars entered Europe. However, while the northern boundaries of most of the trees indigenous to Russia in Europe, sink from west to east, that of *Acer Tataricum* rises, marking it at once as a characteristic Asiatic species. It is found in the region above mentioned where the linden fails. There are two names for the linden in Magyar, *Hárs* or *Hás*, and *Száldok*. The first is obviously the same word as the Kalmuck name *Zarza Modon* = *Acer Tataricum*. It is unnecessary to argue against the supposition that the name of *Acer Tataricum* was borrowed from that of the linden, because the former is indigenous to where the name *Zarza* is used, while the latter is not.

Kotyó.

Prunus domestica is usually considered to be indigenous to Armenia and the Caucasus. The Magyar name *Kotyó* is not easily traced, but on closer investigation it may be found to be related to *χυδώνια μηλέα*, the name given to the quince. This word, according to Pliny, is derived from Cydon, in Crete, whence they were introduced into Greece. Martens suggests that the word *χοδύμαλον* (or according to ancient versions *χωδύμαλον*), is connected with *χυδώνια*. According to Hermon, cited by Athenæus, this name was given by the Cretans to the quince, and, if Hesychius' derivation from *χώδιον*, fleece, be correct, it would mean woolly apple, and, therefore, correspond to the *Cotoneum malum* of Pliny. If the origin of the Greek name be correct, and that my supposition be just, the Magyars acquired this name only after contact with the Greeks. It may, however, happen that the Greek name is not borrowed from Cydon, but came with the plant from the eastward—in any case the nearest point at which they could have become acquainted with prunes was in the neighbourhood of the Caspian Sea, either from the Greek side, or from the Bactrian countries south of the Sea of Aral, whence immense quantities of dried fruit are sent annually into Siberia. The trade appears to have flowed towards the Volga before the irruption of the

²⁶ Verbreitungs Gränzen der Wichtigsten Holzgewächse des Europäischen Russlands Graphisch dargestellt vom A. Bode. Beiträge zur Kenntniss des Russischen Reichs, Bd. 18, S. 56.

Magyars. It may be worth while, therefore, to examine more closely into the etymology of *χοδύμαλον*.

Armeniaca vulgaris, as its name implies, is a native of Armenia and the Caucasus, where it still grows wild; from the former country it was introduced into Greece by Alexander the Great. There appears to have been some confusion with regard to the Magyar name *Medgy* for this fruit, which is more properly that of the *Mespilus Germanica* or medlar. I believe the word to be of Gothic origin, and picked up on the Don or Terek. Medgy.

The words *Magyalfa* (holly) and *Mogyoró* (hazel) resemble each other very much. This affinity cannot be accounted for by any resemblance between the plants. The holly, although more abundant in beech forests, is often, like hazel, found forming a close thicket in oak forests, under the protecting shade of which they both thrive, while they in turn shelter the roots of the oak in winter from frosts. These thickets are so entangled as to be almost impassable, and, if the following comparisons be correct, it is from this circumstance that the Magyar names are derived: Magyalfa
and Mogyoró.

Tavgy-Samoyede, *mogga*, *mo* = branch; Tungus (Siberia), *mô*; Ostjak-Samoyede, *mag*, *maga* = stick; *mak* = board; *saga* (also *hag*), *seaga*, = black, dark; *seak-hal-tâng*, a black mountain ridge; *sânga*, *sianga* = pine forest, dark forest (compare *Sayan*, mountains); *mâgalzâk* = to lose one self. *Tavgy-Samoyede*, *faemaga* = dark, obscure, as applied to a forest, from *fa* = tree, *moga* = branches (compare *fimie* = evening, *faema* = winter boots.) Perhaps *paebi* = dark in Yurak-Samoyede, is likewise related. Compare also Tungus, *môdugi*, barberry, and Mongolian, *Zarza modon*, *Acer Tataricum*; *modon* = tree.

The Magyar *nad*, *Phragmites communis*, is obviously the Polish name for the same plant, *Fedö nad*. I have not as yet subjected those words, which are common to Polish and Magyar, to a strict analysis; but besides the one just given, there are several others in the foregoing list; for example: *papits*, *Anemone sylvestris* = Pol. *Fejer pipat*, *Anemone nemerosa*. This word appears to be related to Russian *paparot* = fern; Pol. *paproc*; old Bohemian, *paprut*, now *papradj*; Slovenic, *paprat*, *praprot*; Lith., *papartis*; Lett., *papardis*. Again, there is the old High German word *pîpôz* = *Artemisia*, corresponding to Lettish *bibohtes*. There is also the Magyar word *pipitér* = *Anthemis nobilis* (or *tinctoria*), which corresponds to Osmanli *papadya*. The whole series is probably Slavonic. *Szulák*, *Clematis Vitalba* = Pol. *skulak*; *Ternye*, *Alyssum incanum* = Pol. *Terrage fù*; *Tseperke*, *Aga* Papits.
Pipitér.
Szulák,
etc.

Arpa. *ricus campestris* = Pol. *Tseperkey Gomba*; *Tsermolya*, *Melampyrum arvense* = Polish, *Tshermety*; *arpa*, barley = Pol. *arpu*. The latter example shows that the same word may exist in the two languages, without the one having borrowed from the other, *arpa* being, in fact, the Turkish name from which both Magyars and Poles borrowed it. It is well known that Poland held dominion over the plateau of the Ukraine, and that the region between the Dnieper and Volga was occupied in the time of Plano Carpini and Rubriquis by Cumanian Turks from between the Caspian and Aral seas; and that these same Cumanians also entered Volhynia and Hungary, where they have been absorbed. This circumstance may, therefore, account for the coincidence of many words of Turkish origin between both languages.

Repkény. The Magyar name, *Repkény*, *Hedera Helix*, or ivy, I believe to have been originally applied to *Glechoma hederacea*, or ground ivy. The *Hedera*, not being capable of bearing much cold, does not appear to occur beyond the lower Volga; the ground ivy on the contrary is found in Siberia, as Pallas mentions it on the Tobol. It has several names in German; one of which, *Donnerrebe*, suggests the God of Thunder. The Letts call their thunder god, *Pehrkon*, and *Glechoma hederacea*, *pehrkones*, a word which must exist in other Slavic dialects, and from which the Magyar name is simply formed. It may be worth remarking, however, that the Ugrian Mordvins on the Volga call their thunder god, *Porguini*. This tribe is considered to have affinities with the Magyars, and occupies a district close to the presumed original seat of that people.

Szölö. *Szölö*, grapes, appear to be obtained from Georgian, *Kurtsoeni*, the first part of the word being here = fruit.

Füz. Perhaps the most universally distributed family of trees is the *Salicineæ*. Some species occur even along the banks of rivers in the most arid Steppes. In Magyar, the *Salix* is called *Füz*, a word which appears to have no relationship with any of the surrounding languages, its nearest affinities being with the remote Kamtskadale *Sûsûh* = *Salix*; Mongolian *Azola*. The Osmanli *Saz* = reeds, rushes, a musical instrument; modern Persian (? Turkish) *Sazak*, pine, resinous wood; and Osmanli *Toz agadje* = poplar tree, are no doubt related, as also Tatar of Kasan, etc. *Asak*, *usak terek* = *Populus tremula*. The birches are also widely distributed trees, being found at every point between the



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Magyar word *Zsolna* is the name of *Picus flavovirens*, and corresponds to the Russian name of *Picus martius*, *Shalna*.

Exam-
ples of
names of
fish.

Among fish may be given: *Perca* in Magyar is *sígér*, *sügér*, which is the Usbek-Turkish *sagora*, *Cyprinus carpio*; *Cyprinus cephalus* in Magyar is *száp*, and in Russian *sapa*; *Cyprinus aphyra* in Magyar is *ökle*, corresponding to Lithuanian *aikshle*, *Cyprinus alburnus*, etc.

Not
space
enough
to give
complete
analysis.

Argu-
ments
suffi-
cient,
however,
to estab-
lish au-
thor's
proposi-
tion.

A volume of considerable size would be required to contain the complete analysis of the Magyar: I have only attempted to give a very rough and meagre sketch of what I have even done myself. Incomplete as it is, I think the arguments which have been brought forward are sufficient to establish the truth of my proposition, that the names of plants and animals in a language may be made to serve in ethnology the same relative functions as the actual remains of plants and animals do in geology. Besides that, I am not seeking to establish any theory at present, but merely pointing out a method of research which has not been hitherto tried, it would undoubtedly be premature to draw any conclusions from my analysis as to the original seat of the Hungarians. I may, however, state that so far the results do not support the view that it was in the Bashkir country.

§ 3.

All races
retain
some tra-
ditions of
cosmo-
gony,

which
have
been mo-
dified,

and form
the first
materials
of my-
thology.

Dualism
a charac-
teristic
of all
mytho-
logies.

The different races of men, how low soever their condition be, retain, together with the debris of their primitive language, some fragmentary traditions of man's first knowledge of the Creator of the universe, of cosmogony and physics. These traditions, like the languages through which they have been handed down, have been moulded, changed, and added to, under the influence of the circumstances of each people. Thus modified, these traditions have formed the first materials out of which all mythologies have been gradually elaborated. And like as in the prototype of our knowledge of creation and its Author, and of the principles of good and evil, so beautifully expressed in the account of the fall of man, we find, as the predominant characteristic of all mythologies, a species of dualism, or opposition of the good and evil, of life and of decay. This opposition is not manifested with equal force in all mythologies, being apparently affected by the character of the physical circumstances under which

each has grown up. How different must be the idea of life and decay among the inhabitants of regions of mighty rivers, snow-capped mountains, and plains clad with the rich and varied vegetation of the tropics, where no dark clouds or humid mists check the ardour of the sun's rays, and of herb-covered steppes, or the dreary lichen-covered tundra that fringe the Arctic Ocean!

As the chieftains and heroes of a people, and the enemies with which they contended, gradually fade into the dim twilight of the past, their persons and deeds become interwoven with the primitive traditions and sharers of the Creator's powers. The former are dispensers of good, the rulers of those agencies which favour life; the latter become identified with the causes of evil, of decay. But the real is not the only foundation of mythology; the imagination weaves together unconnected ideas and incidents, or invents new ones. These creations are, however, cast in the mould, and bear the impress, of the region where they arose; the boulders scattered over the plains, the chasms of the mountains, are the work of the departed heroes; the animals, plants, and even inanimate objects are often made to embody them.

If we contrast the Indian, Persian, and Grecian mythologies, which have undoubtedly many points in common, we shall find how completely each expresses the physical nature of its peculiar region. The magnitude of the mountains, rivers, and plains, the luxuriance of the vegetation, the forms of peculiar plants and animals, the diversity of the plumage of the birds, the periodicity of the atmospheric phenomena of rain and wind, and the marked separation of the seasons, caused the growth of a complicated pantheism, in which the wild vigour of production and destruction in nature is embodied. How completely the simple, beautiful mythology of the ancient Persians, as revealed to us in the Zend-Avesta, harmonizes with the cloudless sky and comparatively unpicturesque character of the ancient Bactria! How natural does the origin of sun and fire worship seem to us in a country whose sky is thus described: "There is a constant serenity in its atmosphere, and an admirable clearness in the sky. At night the stars have uncommon lustre, and the milky-way shines gloriously in the firmament. There is also a never-ceasing display of the most brilliant meteors, which dart like rockets in the sky; ten or twelve of them are sometimes seen in an hour, assuming every colour—fiery red, blue,

Hero-worship becomes a part of a mythology.

The real not the only basis.

The invented parts also bear a local impress.

The Indian, Persian, and Greek mythologies, express the physical nature of their respective countries.

pale, and faint".²⁷ In the charming countries bordering the Levant and the Ægean Sea, an extraordinary, varied, and diversified, but rather sensual mythology arose, in which the dualism was so little marked, that good and evil actions are often alike attributed to the same divinity. And is not this specially characteristic of all the countries occupied by the Pelasgian race? Are they not devoid alike of marked contrasts of terrestrial outlines or atmospheric phenomena?

Mythology the first subject of poetry; and the early poetry of a nation contains the germs of its future literature.

The traditions and inventions constituting a mythology are handed down from generation to generation, receiving during their transmission, modifications of form, and sometimes of substance, until they are at length moulded into poems. In these early poems we have combined the germs of the cultivated literature of after times. The rich poetic literature of India is a perfect reflection of the action of great forest nature and grand contrasts of scenery and natural phenomena upon traditions, which, when subjected to the monotonous nature of the regions about the Oxus or the arid deserts fringed with forests of the plateau of Iran, produced the Persian poetry, beautiful no doubt, but artificial, in which the murmur of cataracts, the rushing waters of great rivers, the gorgeous tropical vegetation, are replaced by gardens filled with fruit trees and flowers, and cooled by artificial lakes and fountains, in which we have, for the invigorating breath of fresh nature, the odours of rose beds. A rich forest nature and picturesque physical outlines also enrich a language with those subjective expressions that communicate depth and grandeur to poetry. The poetry of a language which has grown up amidst herb-covered plains or arid steppes, unrelieved by wooded mountains, and having a scanty flora, cannot be otherwise than monotonous, and, if the product of a civilized society, must be artificial, and generally loaded with meretricious ornament. This is the character of the abundant poetic literature of the Turks.

The effects of great forests, etc., on Indian poetry bears out the opi-

The powerful effect which the great forests and flower bedecked regions lying at the foot of the Himalaya, and in the valley of the Indus, have produced upon the imagination of the Indian poets, and which is especially visible in their richness of expression and variety of allegory, fully bears out the opinion of A. v. Humboldt, that everywhere that a lively contemplation of nature is

²⁷ Burnes' Travels in Bokhara, vol. ii., p. 158.



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Lotus
Myths.

myths connected with the different water lilies, belonging to the families of *Nymphæaceæ* and *Nelumbiaceæ*. The most remarkable of the plants belonging to the former family are the two species, *Nymphæa lotus*, *Lin.*, or the white lotus, and *Nymphæa cœrulea*, *Sàvigny*, or the blue lotus, which adorn the tranquil waters of Egypt. The former is the *λωτός* of the ancients, though the *N. cœrulea* may have been also comprehended under it: indeed Delile states that it occurs oftener in paintings and sculptures upon the Egyptian monuments than the white lotus; and according to Athenæus, the ordinary lotus garlands made at Alexandria were woven with the blue lilies.

Relation
of Lotus
to over-
flow of
Nile.

The fertility of Egypt depends upon the inundation of the Nile, and it is at this season the lotus makes its appearance. The dry rhizomes which remain in the soil from the preceding year, vegetate as soon as the advancing water moistens the ground. Hence the expression of the Egyptians,—the more lotus, the more Nile. When the inundation is at its height, the surface of the water is covered with large floating leaves and magnificent flowers. For these reasons were they considered emblems of the creation of the world out of water, symbols of abundance, and therefore of the favour of the gods. The seed being sometimes ground into meal and used as food affords an additional reason for the plant being looked upon as a symbol of abundance. Hence, too, perhaps the reason that Demeter of the Greeks, or Ceres, is sometimes found with this symbol. The flowers were also sacred to Osiris as the sun god, because they were believed to close their petals at sunset and sink beneath the waters, and re-open them at sunrise.

N. alba
the
subject
of the
Myth
of Her-
cules,

Another species, the *Nymphæa alba*, *Lin.*, or common white water lily, was connected with Hercules. A myth relates that a nymph, jealous of that god, having killed herself, was transformed into the plant just mentioned. To this circumstance was attributed the club-shaped form of the root, and the name Hercules' Club sometimes given to it. "*Nymphæa nata traditur nymp̄ha zelotypia erga Herculam mortua qua re Heraclion vocant aliqui, alii rhopalon a radice clavæ simili*".³⁰ The Javanese and some other East Indian people place the flowers of *Nymphæa pubescens*, *Willd.* (which so closely resembles the Egyptian

³⁰ Pliny, L. xxv., cap. 7.

lotus that it has been confounded with it), in their hair when visiting the temples. It is the *N. alba* which is venerated amongst the Frisians and Zealanders. The Dutch call it *plompe*, the Frisians *pompe*. Properly speaking, the broad leaves swimming upon the water are pompebladden. The fragrant flowers with white petals surrounding the golden yellow anthers are called swan-flowers (*Swanne blommen—flores cygnei*). The Frisians have “Zeven plompenbladden” on their shields, and believe that under this sign they are victorious.³¹ This heraldic feature is alluded to in the old German poem of Gudrun.

and of
the veneration
of the
Frislanders.

Allied to the preceding is a still more beautiful plant, the *Nelumbium speciosum*, or rose lotus of India. This plant is included by the majority of authors under the term, and by some is even considered to be alone entitled to the name. It is the *κύαμος αἴγυπτιος* of Theophrastus. Its leaves, which are from one to two feet in circumference, are so perfectly circular that this may have been one of the causes of its veneration, as the circle was looked upon as the most perfect figure. Hence, too, the reason of the epithet, lotus-leaf-eyed, applied to Krishna in the Indian poem, *the Baghavad Gita*. They are hollowed in the centre like a shield, the nervation radiating from the centre, at which they are attached to a long petiole which lifts them out of the water. The flowers are as large as a magnolia or large pœony, mostly rose-red, seldom white, and having an agreeable smell like anise, and, unlike *nymphæa*, do not float, but are elevated by long flower-stalks above the water. Its fleshy torus, which has the form of an inverted cone, enlarges considerably during the ripening, and its upper surface is pierced with alveoles, in which are imbedded the carpels, about the size of filberts, and containing a single seed externally black and internally white, and which, as well as the rhizome, are edible. On this account the nuts are considered by some to be the *Faba Egyptiaca*, or bean of Pythagoras, of ancient writers. The hardened torus floats upon the surface of the water, and, as the seeds often prematurely germinate, it presents the appearance of a living cornucopia: hence it was a symbol of fecundity and abundance. The *Nelumbium* is a native of India and other parts of the East, and grows abundantly in different parts of the Peninsula, Ceylon, Java, China, etc. It is a

The Indian or
rose
lotus.

³¹ J. Grimm, *Deutsch Mythologie*, 1, s. 420.

conspicuous object in the old Indian mythology, and is still revered by the modern Buddhists. The leaves and flowers of the *Nelumbium* abound in spiral vessels, which are carefully extracted, and form the wicks which, on great and solemn occasions, are burnt in the lamps placed by the Hindoos before the shrines of their gods.

The
lotus
myths
among
the
oldest
known.

That of
Brahma,

Lacshmi
and

Vishnu.

Myth
in the
poem of
Brandaen.

The most important myths connected with the preceding plants may be considered as among the most ancient traditions that speak to us of the primitive world, for they carry us back to that remote period when the waters retired from the surface of the deluged Earth. According to the ancient Indian myth, the tomara or lotus grew from the umbilicus of Narayana, the water-moving spirit, that is Vishnu, and from this lotus flower came Brahma, who then floated in one of its leaves, meditating for a thousand divine years through the abysses of the ocean, until Vishnu commanded him to create the world. The feminine image and wife of Vishnu, the lily of Heaven, Padma, Lacshmi or Sri, daughter of the benignant sea god, Varuna, is also represented as living in the lotus, hence the names Padma, Ramâprija (*i. e.* beloved of Rama or Lacshmi), and Srîvâsa (house of Srî). Another myth recounts that, when at Brahma's death the dry land is submerged below the water, Vishnu, as a diminutive child, sits on a leaf of the pippala (*Ficus religiosa*), sucking the toe of his right foot, swims on the milk sea.

In the poem of Brandaen, published in Blommaert's *Oudvlaemsche Gedichten*, we are told how Brandaen met on the sea a man the length of a thumb, who floated on a leaf, having in his right hand a small basin, and in his left a style; he plunged the style in the sea, and allowed the water to trickle from it into the basin; when the latter was filled he emptied it and refilled it; the task of measuring the sea until the day of judgment having been imposed upon him.

The *Nelumbium speciosum* was formerly cultivated in Egypt, for it is mentioned among others by Herodotus, and Theophrastus assures us that its cultivation required particular care. Its rhizomes do not survive the drying up of the soil like those of the *nymphæa*; and, consequently, in order to thrive, they must be constantly submerged. The conditions necessary for its growth are, therefore, very rare in Egypt, and accordingly it has gradually disappeared from that country on its cultivation being given up. It is generally assumed that it was not

The rose
lotus
formerly
culti-
vated in
Egypt,

but is
not now
found.



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and existed in several European languages;

and the plant had names to express its floating.

Plompen one of them,

usual etymology of the word,

not the true one,

is derived from *plu*, and perhaps connected with $\lambda\omega\tau\omicron\varsigma$.

Conclusions from this.

pean languages, and that the earliest names of the *Nymphæa* in those languages expressed their characteristic feature of floating on the surface of the water. Few of those names are now in general use, but no doubt many of them still survive in those localities where the plants abound. I believe that the Frisian name *plompen* is one of them. As my etymology for this word differs wholly from that usually given, it will be necessary to state the arguments upon which I found it. The ordinary derivation is that given by J. H. Halbertsma.³² According to him, people are still very careful in breaking and carrying the *plompen* or waterlily in Friesland. Whoever falls while having this flower in the hand, gets the falling sickness. Hence he derives the name from *plomben*, modern high German, *plumpen*, old Norse, *pompa*, to fall down. They are obviously related to French, *plonger*, Gael, *plum*, to plunge like lead; old French, *plunc*, *plonc* = *plumbum*, etc.³³ I believe the apparent affinity of the name of the plant with these words to be purely accidental; for otherwise, how could we account for the existence in Finnish of the name *pulpukka*, and in Mandchu, for that of *shuilcha*, for the same plant? A still closer affinity is exhibited by the Finnish name for *Nymphæa lutea*, *lumbi*, which is obviously = (*P*)*lumbi*, one of the most common changes in Finnish. It appears to me that the true derivation of *plompen* and its allied names, is from the Sanscrit root or its equivalent, *plu*, *fluere*, *natare*, *plava*, a boat, or Greek $\pi\lambda\acute{\epsilon}\iota\nu$, $\pi\lambda\acute{\epsilon}\upsilon\sigma\omicron\mu\alpha\iota$ to sail, swim; Illyrian, *plovati*; Lithuanian, *plūstu*, *plaudite*, to swim upon; Irish, *plod*, to float; old Norse, *fleyta* (*natare facere*); English, *float*; old Slavish, *plot*, a kind of boat or raft. Swedish, *flotta* = Finnish, *lautta*, raft; *luota*, a small island; Lappish *plueve*, lake, morass, etc. This comparison suggests that the word $\lambda\omega\tau\omicron\varsigma$ may itself be a derivative from the same root.³⁴

If further investigations should confirm the preceding comparisons, they will show—1. that the names for *Nymphæa* are very ancient; 2. existing at several points of the world where the plant is also more or less venerated, that we may anticipate the coëxistence of the same legend; 3. that finding a form of legend which is obviously related to the Indian myths of Brahma and

³² Grimm's *Deutsche Mythologie*, Bd. i. 420.

³³ See Diefenbach's *Celtica* I., No. 268, s. 178.

³⁴ In Finland the herdsman's wife makes, on St. John's eve, garlands of reeds, which she hangs on the horns of the cows, and sometimes decks herself with them; these garlands are called *liuh*, pl. *liuh'at*. The

Vishnu coëxisting in a northern climate, with a name which expresses the chief feature of the plant, and especially that connected with the legend, and having an immense geographical extension, we may conclude that the legend was originally applied to the *Nymphæa*, and was consequently subsequently transferred to *Nelumbium speciosum*. Such a transfer may have been made by a northern people, such as the Arians, entering tropical India, and would be the natural result of the impression produced by the beauty of the plant, and the perfect form and shield-like hollow of the leaf. Another solution suggests itself, namely, that the myths existed in India, etc., before the advent of the Arian people, who merely incorporated it with their own mythology. This view is supported by the existence in Java of a form of the lotus legend.

Many persons, overlooking the relation which naturally subsists between the overflow of the Nile and the *Nymphæa*, have considered the *Nelumbium* to be the sacred lotus of Egypt. Lotus flowers appear to occur more frequently than any other plant upon the monuments, indeed it would be difficult to find one without some lotus ornament. But the flower represented on these monuments, at least upon all antecedent to the period of the successors of Alexander, or even to the Roman times, are unmistakably those of the *Nymphæa*. Sir G. Wilkinson, who has paid great attention to the plants represented on the monuments, has the following passage on this subject in his *Popular Account of the Ancient Egyptians* (vol. i. page 57): “But it is singular that, while the lotus is so often represented, no instance occurs on the monuments of the Indian lotus or *Nelumbium*, though the Roman Egyptian sculptures point it out as a peculiar plant of Egypt, placing it about the figure of the Nile god; and it is stated to have been common in the country”. It is probably during the Roman times, when the indigenous religious traditions had been weakened by contact with Greek and Roman worship and literature, that myths were transferred from the *Nymphæa* to the *Nelumbium*. The circumstance already mentioned, of the torus of the latter representing a cornucopia, naturally associated it with the Nile god. So also the shape of the leaf must have suggested the idea that it was the cradle of Harpocrates, the

Lotus flowers common on monuments.

Flowers belong to *Nymphæa*.

Opinion of Sir G. Wilkinson.

Myths transferred to rose lotus in Roman times.

verb *liuhutan*, to move, to rustle leaves, is apparently related to it. It is very probable that these words are also connected with the root *plu*, and that the custom is a tradition belonging to a more southern region.

Myths of God of Silence. This myth may have originally belonged to the Nymphæa, and may have been transferred to the better adapted Nelumbium. The myth of Osiris, as Harpocrates and Osiris probably originally belonged to Nymphæa. Horus or the Sun god, floating on one of the leaves of the latter, is obviously a form of the universally diffused one already mentioned and originally connected with the Nymphæa. When we consider the phenomenon of the overflow of the Nile, upon which the remarkable fertility of Egypt wholly depends, and the intimate connection which exists between that phenomenon and the appearance and disappearance of the lotus, and that no like phenomenon with similar associations is seen in any other part of the world, I think we would be justified in considering Egypt to have been the birth-place of the original lotus myth, some form of which has been current in most parts of Europe and Asia.

How rose lotus came into Egypt satisfactorily explained. But it may be asked, how did the Nelumbium come into Egypt? and might not the myths associated with it have come in at the same time? I think its introduction may be satisfactorily accounted for by the following observation of Sir G. Wilkinson:

“So fond were the Egyptians of trees and flowers, and of rearing numerous and rare plants, that they even made them part of the tribute exacted from foreign countries; and such, according to Athenæus, ‘was the care they bestowed on their culture, that those flowers which elsewhere were only sparingly produced, even in the proper season, grew profusely at all times in Egypt: so that neither roses, nor violets, nor any others, were wanting there even in the middle of winter’. The tables in their sitting-rooms were always decked with bouquets, and they had even artificial flowers which received the name of Egyptian”.

Myths and allegories of Banyan. An example of a somewhat analogous character is afforded by the allegories connected with the banyan tree of India. This remarkable tree is perhaps the grandest vegetable production in the world. The stem throws out, at no great distance from the ground, several great horizontal branches; from these tendrils go out, and, sinking towards the earth, take root, increase in thickness, and thus yield support to the mother bough. At a still higher point, the trunk again throws out branches, and these in turn send down aerial roots, which form an external circle of supporting columns. The branching of the main trunk is similarly repeated at successive intervals, constituting so many stories one above the other, each too forming its circle of pillars not very regularly outside the preceding one, but yet so as to form an ever-increasing grove of leafy halls and green archways. This onward growth proceeds upon a gigantic scale. The highest branches are sometimes two hundred feet from the ground;

Ficus Indica.



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Names applied to trees, and difficulty of deciding to which of them some of them belong.

belief that otherwise the banyan would not produce aërial roots sending tendrils to the ground. The tremulous foliage of the pippala is indicated by the Sanscrit name K'ala-dala. This name could not be applied to the banyan, but Kung' Arâcana (elephant fodder) may be applied to both, as the leaves of the two are eaten by that animal. Bôdhidruma, or tree of intelligence, appears to have been always applied to the pippala, as there is no doubt that it is the Bo, or Bogaha Bhandi, etc., or sacred tree of the Buddhists in Ceylon, Nepaul, Ava, etc. It is not so easy to decide to which of the two several other names originally belonged, but especially the usual and therefore most important one, *Asvattha*. Ritter, under the impression that the pippala, as is stated in all botanical books, does not produce aërial roots, considers that the banyan (*Ficus Indica*) is the asvattha of the Vedas, but that at a later period it was also applied to the other. He also considers that there was originally but one sacred tree. Fr. Hamilton, on the other hand, seems to think that from the very commencement the two trees were venerated, and that while the banyan was the chief sacred tree of the Brahmins, the pippala became that of the Buddhists. Lassen, on the other hand, doubting the statement made in the botanical books, that the *Ficus religiosa* does not form aërial roots, considers that the words asvattha, etc., were originally applied to it and have never been used for the banyan. There is no doubt that the tree which is called asvattha in the celebrated drama of Kâlidâsa the *Sâkuntalâ*, is also called in the same work by the picturesque name of k'aladala, or quivering leafed. In other works the same tree, which is called *Asvattha*, is likewise called, as Lassen remarks, *Avâkçâkha*, that is with downward directed branches. I am not aware, however, whether the two epithets are ever used in the same work. It is curious how much doubt and error exist relative to this apparently simple question. If the statements in the most recent botanical works, according to which the pippala is described as being recognizable by its rootless branches, be correct, Ritter must be right.

Symbolism of the *Asvattha*.

In the old Indian philosophy the *Asvattha* was the emblem of existence, of the union of the spiritual, in a pantheistic sense, with the sensuous. The labyrinth of stems, which prevents the form or the beginning of the tree from being distinguishable, symbolizes the difficulty of searching out the origin or foundation of wisdom, while those

numerous aërial roots sent down from the branches represent the bonds in which the earthly passions hold the soul desirous of soaring upwards to that wisdom, to attain which, they must be cut off by the sword of reason. The leaves, too, are compared to the sacred writings in which that wisdom is unfolded. Its never-ceasing extension and renewal was also to the Brahmin the image of the eternal revolving course of nature, of the mobility of life, as opposed to that eternal equable repose towards which it constantly tends to relapse, according to the cosmogony of Menu. This allegory is beautifully expressed in the celebrated episode of the Mahabharata, the ancient Bhagavad Gita, or Godly Song, in which the philosophy of the Sankya system is so sublimely unfolded to us; a philosophy which, according to the opinion of W. v. Humboldt, is equally old with the ancient Greek anterior to Parmenides. Krishna, the incarnation of Vishnu, the supreme upholder of the universe, thus discourses to the hero Ardhshunas:—

Asvattha, it is said, has the root above the branches downwards, the leaves are sacred verses; they are known to him who is master of the Vedas. What grew out of nature and the sensuous strives upwards and downwards—downwards the roots, which, on Earth, bind with a network the labours. The tree's form, size, beginning or existence, is not here recognizable; cut off the long roots with the sharp sword of equanimity. Then seek the place whence no one who reaches it returneth: thither is the way to the highest genius, to the ancient origin of things.

Allegory
of the
Asvattha
in Bha-
gavad
Gita.

He who, without ambition, base malice, and envy, elevated beyond pleasure and pain, meditates continually on the highest, certainly advances himself towards the eternal region, where sun, moon, or even fire shines not; whither gone, no one returneth, there where is my elevated dwelling. One part of me always dwells living in the life world, and draws to itself the soul and the sensuous from the kingdom of nature. When a body appropriates to itself the Master, or abandons him, he unites with it like unto the wind which wafts the fragrance of flowers. Interpenetrating the sensuous, he gives hearing, sight, feeling, taste, and smell. The foolish see not that it is he who comes, tarries, enjoys, puts on the form of nature; those alone do so whose vision wisdom brightens. The pious who strive behold him in themselves; nevertheless the rude, fools, see him not even when they endeavour. The splendour which, springing from the sun, illumines the world, and is in the moon and fire, that know! is mine! I am he who, penetrating through the Earth, gives life-force to beings. I who, transformed into sap, produces flowers, healing and sacred herbs. Dwelling as Vaisvanaras,³⁵ in animated bodies, being one with the inspiration and expiration, I boil four kinds of meats. Memory, knowledge, judgment, which dwell in each heart, come from me. I am the Vedas' contents, and its creator and expounder. There are two genii in the world—the mobile and the quiescent. All existence is the former; the latter standeth on the summit. Yet there is another still higher, called the highest spirit, who,

³⁵ Penetrator of Men—a name of *agnis* or fire.

penetrating through the triple world, maintains it—the Eternal, the Lord. And because I am greater than the mobile and also than the quiescent, therefore am I named in the world and in the Vedas highest genius. He who undazzled thus acknowledges me as the greatest genius, he, recognizing the All, honours me with his whole existence. Thus, O Pious! have I unveiled to thee the most hidden knowledge. He who understands it is wise, as had he fulfilled every duty.

Myth of
the F.
Reli-
giosa.

Under the continually quivering foliage of the pippala, Buddha sinks down in the deepest meditation. This image of life, of unceasing motion, must strongly direct the thoughts to the eternal, the quiescent, the unchangeable; under this tree, therefore, he reaches the highest stage, that of a buddha. Hence the tree became to his followers a symbol of the intelligence—Bôhdi, and one of their most venerated objects. But the beautiful allegory of existence faded from among the Buddhists—perhaps because the pippala does not recall it to the mind by its manner of growth.

Myth of
the As-
vattha
in the
Oup-
nek'hat.

In the compilation of the four Vedas, the so-called Upanischad, made by Mahomedan translators in the seventeenth century, and which, under the name of Oupnek'hat, was made known in Europe by Anquetil Duperron, a tree is alluded to in connection with a very important myth, in the following passage:—"Mundus arbor est, quod radix ejus supra est et rami illius infra sunt, et nomen hujus arboris Asthenteh est, *i. e.*, arbor, quod corruptionis capax non est, et stabilis non manet; et folia illius semper in motu sunt. Et hæc arbor Mundus in hac proximitate producta non facta est: a longo tempore est. Radix hujus arboris Brahm est, et (hoc Ens.) purum est; et illud sine cessatione dicunt; et omnis Mundus cum eo addictus (alligatus), ulla persona ab eo non potest transiri; ipse hic Atma est. Omnis Mundus e Brahm egressus est", etc.³⁶

The al-
legory of
the B.
Gita
implies
aërial
roots,
the
others
trem-

The allegory of the Bhaghavad Gita applies to a tree with aërial roots, and contains no allusion to quivering leaves, and may therefore be referred to the F. Indica. The legend of Buddha refers to the F. religiosa; but, so far as I am aware, does not imply aërial roots. The legend in the Oupnek'hat refers to a tree corresponding to Lassen's idea of the asvattha, that is, to one having both aërial roots and quivering leaves. This legend appears

³⁶ Not having had an opportunity of consulting the original work of Duperron at the moment of writing this essay, I have been obliged to borrow it from the admirable monograph of Ritter on the banyan. *Erdkunde* Bd. IV. 2^{te} Abth. S. 656.



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and therefore shows that the philosophy existed before the advent of the Arians in India.

as, aç, esse (Sanskrit *as*); and I would suggest *vata, ventus*, —figuratively the soul or spirit. If this comparison be correct, it is obvious that the name existed before the Arians came in contact with the banyan, unless indeed we adopt the opposite, and very unusual one, that the Zend philosophy and language came into Bactria from India, or at least from the region of the banyan. It is impossible to overrate the importance of the existence of the word *asvattha* among the Zend people, because it shows that the entrance of the Arians into India was, comparatively speaking, a recent event, and that philosophic doctrine must have already made considerable progress before that period. It also points to a much more western origin of the Arians than the Bolor mountains. It may not be out of place to observe that the word *asvattha*, as I have here explained it from the Zend, would not be at all inconsistent with quivering leaves, but, on the contrary, appears to me to support Lassen's view, that the *asvattha* was always the *F. religiosa*.

Other myths must be omitted from want of space.

The length to which this essay has already run forbids me to discuss a number of myths for which I had collected materials, such as those relating to the laurel, jasmine, *Nyctanthes arbor tristis*, and other plants. I also proposed to discuss those derived from the fossil elephant or mammoth entombed in the frozen earth of Siberia. The latter would have afforded an excellent example of the action of geological phenomena upon mythology, for that remarkable fossil has given rise to the strangest legends among almost every people from Finland to China; above all, it has left a deep impression on the heroic legends of the north-eastern Turkish tribes. I will accordingly confine myself to a brief notice of some myths taken from the great Finnish Epic, the *Kalewala*.⁴⁰ These will not only supply us with a characteristic myth originating in geological phenomena, but will also serve as illustrations of the action of nature upon the primitive literature of nations.

Only a few from the *Kalewala* can be given.

herausgegeben von Dr. Hermann Brockhaus, Prof. d. Orient. Spr. an d. Universität Leipzig. Leipzig, 1850.

⁴⁰ As I presume the *Kalewala* may be unknown to many of my readers, I will make some brief observations about it. More than this would be foreign to the object of the present essay; but perhaps, on another occasion, I may take an opportunity of making the readers of the *Atlantis* fully acquainted with that remarkable work, as well as with the heroic legends of North Asia.

In the year 1828 an ardent admirer of the literary fame of his country and race, a Finnish physician named Elias Lönnrot, set out on a difficult and laborious enterprise, for which he appears to have possessed

The classical elements were—fire, earth, air, and water. Iron a
The Finnish mythology has substituted iron for earth, and Finnish
it accordingly plays a conspicuous part in it. Its origin, as element.

every moral and intellectual quality. His mission was to collect together the ancient and modern poetry of the Finns. Journeying, during four years, from village to village in Finland and the government of Archangel, and living in the midst of the people, he collected from their mouths the traditions handed down from generation to generation, and which, fortunately for science, the isolation produced by geographical position and other circumstances had saved from being forgotten. The result of this truly patriotic labour was the publication of a vast number of ancient and modern detached poems under the name of *Kantelatar*, and an epic, in two volumes, under that of *Kalewala*. The latter was published in 1835, and comprised somewhat more than 12,000 lines in 32 songs. Under the auspices of the Literary Society of Finland, new material was accumulated, and, in 1849, a second edition, or rather a wholly new poem, was brought out in one volume containing no less than 22,793 lines in 50 songs. It is needless to observe that no single person knew the whole of this mass, and that it was composed by different persons and at different times. Lönnrot is considered to have merely arranged them and jointed them so as to form a consecutive whole. Many of them, even in their present form, are supposed to have existed before the introduction of Christianity; others of them are decidedly modified by, if not wholly created under, its influence. The cosmogony is of a most extraordinary character, and, as given in the first *Kalewala*, is in many instances more ancient and peculiar than the form it has assumed in the second.

Finnish poetry, like that of many other northern nations, uses as a substitute for the more highly organised rhythm of more cultivated languages, what is termed alliteration, or the recurrence in the same line of two or more words, beginning with the same consonant; a contrivance which may be contrasted with the assonant or vowel rhymes of southern European nations, particularly Spanish and Portuguese. Alliterative verse has been very rarely used in English; the following lines of Peter Plauwman will give an idea of the effect:—

“ In an *habit*, as an *hermit*, an *holy* of work,
Went wide in the world wonders to hear”.

This example, from the German poet Bürger, is not so strongly alliterative:—

“ *Wonne weht* von Thal und Hügel,
Weht von flur und Wiesenplan,
Weht vom glatten Wasserspiegel
Wonne weht mit *weichem* Flügel
Des Piloten *Wange* an”.

The character of the alliteration in Finnish will be seen by the specimens printed further on.

The metre employed in the *Kalewala* consists of eight trochaic feet, or long and short syllables, which do not rhyme. This is the kind of metre used by Longfellow in his “*Song of Hiawatha*”, and although perhaps this is not the proper place, I cannot help expressing my admiration at the manner in which he has caught the peculiar spirit of the poetry of rude northern nations. Judged from this point of view, the *Song of Hiawatha* is really a remarkable production.

I shall only add that to my colleague, D. F. M’Carthy, is due whatever merit the versification of the translation from the Finnish possesses.

described in the Kalewala, is one of the most remarkable episodes in the whole Epos, and affords one of the most striking instances of the creation of a myth from a purely physical phenomenon.

Origin
of iron,
an epi-
sode of
the
Kale-
wala.

Wäinämöinen, the great hero of the Kalewala, having fallen in love with the charmingly-dressed virgin of the Northland, woos her, and after some difficulties she promises to yield to his entreaties, provided he constructs a boat from the splinters of her spindle, and launches it without touching anything. The hero having begun his task, wounds himself in the knee with an axe; unable to stop the flow of blood, he seeks some one cunning in magic who could bind up his wound, and finds an old man who promises to stay the bloodstream. Amazed at the quantity of blood which flowed from the wound, and the power of evil which iron possesses, the old man asks the hero to tell him the origin of iron. The hero complies with his request and recounts as follows:—

Silloin vanha Wäinämöinen
Sannan virkkoi, noin nimesi :

“Itse tieän rauan synnyn,
Arvoan alun teräksen :

Ilma on emoja ensin.
Vesi vanhin vejeksiä,
Rauta nuorin veljeksiä
Tuli kerran keskimäinen”.

“Tuo Ukko ylinen luoja,
Itse ilmojen Jumala
Ilmasta ve'en erroitti,
Veestä maati manterehen,

Rauta on raukka syntymättä,
Syntymättä, kasvamatta”.

“Ukko iimoinen Jumala
Hieroi kahta kämmentänsä,
Mykelti molempiansa
Vasemmassa polven pääsä ;
Siitä synti kolme neittä,

Koko kolme Luonnotarta
Rauan ruostehen emoiksi,
Suu sinervän siittäjiksi”.

“Neiet käyä notkutteli,
Astui immet pilven äärtä

Spake the ancient Wäinämöinen,
These the words the ancient ut-
tered:—

“Well I know the source of iron—
Well I know of steel the birth-
throe :

First, is air of all things mother,
Water is the eldest brother—
Youngest brother is the iron—
Fire, the second, stands between
them.

“Ukko, the o'er-all Creator,
He himself the God of Heaven
Sundered from the air the water ;
Then the water from the earth-
scum—

Unbegotten was the iron—
Never grows the unbegotten.

“Ukko, yea, the God of Heaven,
Both his hands he rubbed together,
Pressed the one upon the other,
On the left knee's topmost summit,
Thence there starteth forth three
maidens,
Loveliest three Luonnetara,
Of the iron's rust the mothers,
At the Heaven-hued blue mouth
brought forth.

“Tottering then the three went
onward,
Forth from out the cloud's edge
stepping,



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ferently
told in
the first
Kale-
wala.

ginal, I shall take it from the careful translation of Léouzon Le Duc.⁴¹ Wäinämöinen thus speaks:—

“I know the origin of iron, I know whence steel is come. Three infants have issued from the same origin: water, which is the oldest; iron, which is the youngest; and fire, which holds the middle rank. The fire displayed its rage, the flames darted insolently, and grew great with pride; it spread horror. The lands were burned, the swamps were burned in this great year of sterility, in this fatal summer, which devoured with an indelible fire all the beings of nature. Then the iron sought a refuge where it may hide itself.

“The old man cried from the depths of the hearth, and said: ‘Where did the iron hide itself, where did it find a refuge during this great year of sterility, during this fatal summer, which devoured all the beings of nature?’ The old, the brave Wäinämöinen answered: ‘Then the iron hid itself; the iron found a refuge in the extremity of a long cloud, on the top of an oak stripped of its branches, in the swelling bosom of a young girl’.

“There were four virgins, three betrothed, with breasts swoln and suffering. They spilled their milk on the earth: the first, a black milk; the second, a white milk; the third, a red milk. From the virgin with black milk was born flexible iron; from the virgin with white milk was born brittle iron; from the virgin with red milk was born steel.

“Afterwards the iron hid himself during two years in a vast swamp, on the top of a rock, where the swans deposited their eggs, where the duck hatched its young. And the wolf ran through the swamp, and the bear descended upon the sterile plain, and they turned up the earth which concealed the iron.

“A god visited the route, and he saw the black sand which the wolf had upturned, which the bear had trampled underfoot, and he said: ‘Misfortune upon thee, miserable iron; a sad destiny menaces thee in thy abject abode, under the feet of the wolf, under the tracks of the bear!’

“And from that day the iron was drawn from the swamp, purged from the dross of the earth, and dried from the humidity of the waters”.

Com-
parison
of the
two forms
of myth.

In the myth as given in the second Kalewala, it appears as if iron did not exist before the sprinkling of the milks, and that it is to this late origin allusion is made where it is stated, iron was the youngest brother; it is only in the form of milk, too, that the iron hides itself. In the first Kalewala, on the other hand, the iron preëxisted, and in hiding from fire gets transformed into the three milks, and again hides itself in the swamp, etc. This early form of the myth appears to me more original and bespeaks a very remote origin; it also harmonizes better with the creation of the universe, in which iron plays a conspicuous part, as described in both editions, but more fully and consistently in the second.

Iron
plays a
part in
creation
of the
world,
as rela-
ted

The daughter of the air, wearied with the solitude and perpetual virginity to which she is doomed in the lonely

⁴¹ La Finlande, son Histoire primitive, sa Mythologie, sa Poésie épique, avec la traduction complète de sa grande Épopée La Kalewala, etc. Par Léouzon Le Duc. 2 vols. 8vo. Paris, 1845.

regions of the atmosphere, descends upon the ocean, where, by the action of the winds and waves, she becomes pregnant. She then wanders for ages through the waste of waters lamenting that her child is not born; at length a bird flies through the air, uncertain where to build her nest and lay her eggs:—

<p>“Then uplifted ocean’s mother— She, the blue air’s beauteous daughter— Out of the sea her round knees lifted— Out of the waves her white-boned shoulders. Knees whereon the duck may nestle, Building there her peaceful dwell- ing.</p>	<p>Thought that from the knees’ hot glowing All the veins would melt within her.</p>
<p>“Duckling, bird of downy softness, Flieth slowly, looks around her, Sees the knee of ocean’s mother, O’er the green sea ridges risen, Takes it for a grassy hillock, Thinks that fresh green turf spreads o’er it.</p>	<p>“Hastily her knees she moveth, Shakes her limbs with so much roughness, That the eggs into the water— Into the waves of ocean tumble: There in mighty pieces splitting, They themselves in splinters scatter.</p>
<p>“Thither now she flies, slow float- ing, O’er the knee lets fall her pinions, Builds thereon her needful nestlet, Lays within it eggs all golden— Golden eggs full six in number— Then a seventh egg all of iron.</p>	<p>“Not beneath the mud they perish, Not within the waves the pieces, But transformed with wondrous beauty, Made anew in every splinter, From the egg’s half dome—the lower— Was the lower earth’s arch fash- ioned.</p>
<p>“O’er the eggs she sitteth brooding, Quickly warms the arching knee- pan. Broodeth one day, broods a second, Also on the third day broodeth; Then betimes knew ocean’s mother, She, the blue air’s beauteous daughter, Noticed that her knee grew hotter, That the skin was warming over,</p>	<p>“From the egg’s half dome—the upper— Was the heaven’s high arch formed. What of yellow was forced upward Beamed as beauteous sun resplen- dent, What of white above was scattered Shone as moon with friendliest beamings. From the egg’s translucent portions Were the numerous stars en- kindled— From the egg’s more dark interior Were the dusky air-clouds ga- thered.</p>

The explanation of this very remarkable myth appears to me to be very simple. Taking for a moment as our text the first Kalewala, we have three hiding places in which iron took refuge from the destructive rage of fire: 1. the extremity of a long cloud; 2. on the top of an oak stripped of its branches; and 3. in the bosom of a young woman.

In the first we have a distinct allusion to the fall of masses of meteoric iron, a phenomenon which has always

Expla-
nation of
Iron
myth
simple.

Allusion
to me-

teoric
iron.

attracted the attention of mankind and served as the basis of many legends. Some of these masses have been seen to fall, while the meteoric origin of others is deduced from their position, structure, and chemical composition. Meteorites have fallen in Finland as elsewhere, such as that of Lontalax described by Nordenskiöld; but one of the most remarkable masses in the world is that found by Pallas on the summit of a mountain between the Abakansk and Belskoi Ostrog, on the river Yennissei, in Siberia. It was first seen by Medvedief in 1750; it was reposing on the ridge of the elevation, without adhering to the rock, in the midst of fir trees. The Tatars reported that it fell from Heaven, and held it in great veneration. In 1749, this mass, which weighed 1680 Russian pounds, was removed to the adjoining town of Krasnojarsk, and in 1772 to the Imperial Academy of Sciences at St. Petersburg. I have specially mentioned this mass, because I have read somewhere, but cannot now recollect where, that in the regions about the upper Tunguska, small masses of native iron are very common, and that many of these had been employed by the natives. Ernest Hofmann has recently⁴² mentioned having received from Mr. Nicolai Maesnikow, of Krasnojarsk, a small sample of native iron, which had been sent to him as platinum from some of the surrounding districts, but the name of which was not communicated. It consisted of splinters, which had the appearance as if cut with a sharp instrument from some iron utensils. They were obtained, it was said, instead of gold, in an alluvial deposit, by a party sent in search of that metal by Mr. Maesnikow. It is very probable, as Hofmann suggests, that there had been deception or mistake about this extremely unusual deposit. It is singular, however, that such a story should arise in the district in question, and obviously there must have been some circumstance to suggest even such a deception.

2. to
light-
ning.

The second hiding place is more or less connected with the preceding. The descent of aërolites is generally announced, though not always, by the explosion of fire-balls. Such a phenomenon is naturally associated with lightning and thunder, during which something is commonly considered to fall to the earth. This belief is further strengthened by the finding of what are called fulgerites, which

⁴² Reise nach den Goldwäschen Ostsibiriens. St. Petersburg, 1847. S. 77—forming the 12th volume of "Beiträge zur Kenntniss des Russischen Reiches und der angränzenden Länder Asiens."



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the second Kalewala, accords in the most singular manner, with the relative geological ages of the ores just mentioned. This coincidence is not, of course, to be attributed to that kind of knowledge of the operations of nature to which the name science may be applied, but merely indicates the rude observation of local phenomena. It is not, however, the less remarkable on this account. The oldest virgin pours out black milk, and magnetic iron is found almost exclusively in igneous rocks, granite, syenite, gneiss, and in altered rocks, such as chlorite and mica slates, etc. Spathose iron, though found in gneiss and altered rocks, is also frequently met with, and in masses, in unaltered stratified rocks as high as the oolite. Haematites are of all ages, but being formed from the preceding, are always relatively newer than them, and some of them are of very recent origin; indeed bog iron may be said to be still in process of formation.

The disposition to attribute the formation of striking masses of rocks to the solidification of milk, blood, or tears, appears to be common among the nations of middle and north Asia. In the plain bounded by hills which stretches to the south-west of the mountain Kalmak Tologoi, near the sources of the Irtysh, a little to the N.N.W. of the lake Dzaisang, occur several naked masses of quartz, the most remarkable of which is the Ak-Tach or white stone, which has the form of a tent; further on occurs the Kysul Tshaku or red knob, which is a protuberance of a reddish-coloured stone, which rises amidst the hills. To these two masses, as well as to the Tologoi itself, belongs a Kirgiz legend of this kind. According to it, this mountain formerly lay south of lake Dzaisang, close by the mountain Ssart Tologoi, in the Tarbagatai chain, where the latter still remains. Among the hills of the sub-chain of Tarbagatai there nomadized two giants—a father and son. Wishing to dam up the river Irtysh, at the town of Ust-kamenogorsk, they lifted up the Kalmak Tologoi and bore it away. When they had reached the spot where the mountain now stands, they halted for the night. Unluckily for them there nomadized at this place a tribe, out of which a bride had been betrothed to the son of the giant, but for whom however the whole kalym⁴⁴ had not yet been paid. A Kirgiz may lawfully see his bride and

⁴⁴The kalym is the price paid by the men to the father of their brides for permission to marry them. Its amount depends upon the previous arrangement with the parents.

Similar explanations of geological phenomena common in Asia.

Legend of the Kalmak Tologoi.

even remain alone with her, but not on any account marry her, until such time as the whole kalym shall have been paid down, a law which indeed they strictly observe. The bridegroom, who had not seen his bride for a long time, begged his father's permission to go to see her, to which the latter gave his consent, but at the same time reminded him that the whole kalym had not yet been paid, and that a breach of this law was the greatest crime. On the following morning the son rejoined the father for purpose of continuing the journey. The father lifted up the mountain at one end, called his son to him, and then allowed the stone to fall upon them. The Tologoi thus became the grave of both giants. The report of their deaths having spread to their home on the Tarbagatai, the wife of the elder giant determined to go and see the mountain which had deprived her of her husband and son. She journeyed as far as where the Kysil Tsheku stands, and there she was shown for the first time the grave of those she loved. As the widow gazed on the Tologoi, her grief wholly overpowered her. Tears, mingled with blood, flowed in streams from her eyes, and were solidified into the red rock of the Kysil Tsheku. After the first burst of grief she went towards the Tologoi, and by the time she reached the place where is now the Ak-Tach, her tears were clear as water, and were transformed into the white stone.⁴⁵

The myth of the origin of iron indicates that the Fin-

The myth of the origin of iron shows that that metal was long known to the Finns.

⁴⁵ Wlangali.—Reise nach der Ostlichen Kirgisen Steppe, S. 89.—20th vol. of Beiträge zur Kenntniss des Russischen Reiches. St. Petersburg, 1856.

the Russians called them *tshudskoi kòp*, or stranger's mines.

Finland abounds in iron ores, magnetic pyrites, specular iron, and an abundance of bog iron ore, perhaps not exceeded anywhere. So far as I can judge, there does not, however, exist that striking association of the three ores which could alone have suggested so singular a myth; for such a one could only have grown up in a district where not only the three ores may be found, but where they would occur in such masses and crop out so as to strike the eye. It is not probable, therefore, that the myth originated in Finland, although it may have assumed its present shape west of the Dwina. Such decorations as that, where a "god saw the black sand which the wolf turned up", have, no doubt, been suggested by some local circumstances, such as, in this case, deposits of magnetic or titanitic iron sand. The two regions which naturally suggest themselves as the probable cradles of this myth are the Ural and the Altai mountains. The former exhibits the association of ores in a most striking manner. The magnetic iron ore is so greatly developed that it often forms the greatest part of considerable hills, such as the Blagodats, where the attention is at once arrested to it by the striking contrast which the black shining ore presents to the adjoining rock composed of flesh-coloured felspar more or less intermingled with magnetic iron. In the immediate neighbourhood are spathic iron and haematites in abundance, and here also have been found ancient workings. We know comparatively little of the Altai chain, but so far it does not appear that the association of ores occurs in so marked a manner as in the Ural.

As I have shown in another part of this essay that the oaks disappear beyond the Ural, the idea of the iron hiding in the top of one could not be of Asiatic origin, and consequently, if we assume the myth to have travelled westward from Asia into Europe, it must be considered to be of comparatively recent introduction. But there is another myth that recounts how the forests were first planted, which appears to me to show that the primitive Finns occupied a country within the region of the oak trees, but subsequently moved northwards to one just on its limits. The following is the translation of this myth as given in the second Kalewala:—

Where did the myth originate?

The idea of the iron hiding in an oak must be European.

Myth of first planting of forests.



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upon
popular
poetry.

ture also common to the Siberian rivers, which, in other respects, resemble the Volga and its tributaries. In the region thus pictured, the oak will only grow upon the river banks, and even then only where cultivated with great care. But still this new country has more of the characteristics of the region of the Kama, Wjatka, and other tributaries of the Volga, than of modern Finland; and I suspect that it was picked up by Lönnrot about the Dwina.

Conclu-
sion as to
original
seat of
Finnish
race from
the
myths
relating
to natu-
ral phe-
nomena
in Kale-
wala.

On the whole, the results of an analysis of the Finnish myths more immediately connected with natural phenomena, appear to lead to the conclusion that the original seat of the race, or at least that in which its primitive traditions were moulded into a complicated mythology, was about the Ural mountains, and between the Volga and the Ural rivers. From this position they must have been driven northwards by the first wave of population, which came from the central table lands of Asia about the beginning of the Christian era. Every successive wave forced back upon the Ural and the Volga the barbarous though allied tribes of Voguls, etc., whose original seat appears to have been about the sources of the Obi. The Yotens of the Scandinavian Sagas have always been invested with the character of giants, and traditions still exist in Finland of such a preëxistent race, under the name of *Wuorenwäki*⁴⁷ and *Hiisi*, the latter being the name by which they are called in the Kalewala. This gigantic race having no doubt partaken of the general motion of the populations west and south of them, during the first century of the Christian era, appears to have almost wholly retired towards the south-west, leaving Finland to be occupied by the Finnish race, gradually forced westward and northward by the pressure from Asia.

This view harmonizes with the existence of a more or less civilized race about the Ural which history points to—the Biarmaland of the Scandinavians—but it is needless to say that it does not support the Finn Hypothesis. Everything appears to show that the Finnish race never extended further west into Europe than they do at present, and that even that extension is comparatively recent

The reader will perceive that although my examples

⁴⁷ Beiträge zur Kenntniss Finnlands in Ethnographischer Beziehung, von Andreas Warelus.

have not been numerous, and in no case fully developed, ^{summa-}
 this essay is already of considerable length. To make ^{ry of con-}
 it longer would be useless, and I will therefore conclude ^{clusions.}
 by summarizing in a few words what I believe I have
 shown: the reader can judge whether I have been suc-
 cessful. 1. In the first place, I think I have shown that
 the coördination of the phonetic characteristics of lan-
 guages would give us most valuable constants, and would
 lead to the discovery of many unsuspected affinities.
 Again, that if the relation between the anlauts of roots
 and the ideas intended to be expressed be fully estab-
 lished, change of climate, vegetation, etc., would change
 the relative proportion of the different letters, in conse-
 quence of a corresponding change in the roots used.
 Further, that the age of the vowels, the proportion of
 mutes and other constants, would consequently indicate
 whether a language had suffered much displacement, etc.
 And lastly, that it is probable that phonetic changes are
 produced by the direct action, during long periods of
 time, of physical agencies, such as a varying density of
 the atmosphere, the effect of echo, and the character of
 the natural sounds in a district, such as that of air through
 pine forests, fall of water, etc., all of which affect the mo-
 dulation of the voice, and consequently, the length of the
 vowels. 2. I believe the examples which I have given
 in the second section are sufficient to show that, as the
 character of a country influences the ideas of pleasure,
 happiness, beauty, grandeur, the food and pursuits of
 men, the words constituting the vocabulary of any one
 district must faithfully exhibit the character of the
 country, and of its vegetation and the habits and pursuits
 of the inhabitants. Again, a word may express an object
 of so specific a character and such limited geographical dis-
 tribution, that by comparing all the languages in which it
 occurs, we may find where it originated, and that such
 words may be used like fossils in geology—to determine
 the origin of a language, and, therefore, of a race, and
 the direction in which it migrated. 3. That myths have
 had, in almost all instances, an objective origin, and that
 by discovering that, we may, in many instances, discover
 where it first arose. And, again, as the language of a
 country is the vehicle of its literature, and as that lan-
 guage bears the impress of its cradle, and also as my-
 thology constitutes the staple of all early poetry, the early
 popular literature of a country must reflect the character
 of the land of its birth.

Object not the Indo-European Hypothesis, but the application of a method of investigation.

It is probable that, upon close analysis, some of my analytical results may be found erroneous, and there can be no doubt that the whole essay is fragmentary and incomplete, and that many will feel disappointed that I have not carried out my analysis to a conclusion in every case, and thus tested the great Indo-European and Finnic Hypotheses. To all such I say, I care not for the hypotheses; I wish only to propose a method of investigating ethnological problems; and accordingly, I sketched in my first article the present aspect of the two great hypotheses above named, in order that they may serve as lay figures upon which to apply my examples. To make the exposition more complete, I analysed the phonetic structure of language and the method of analysing words. Everything brought forward in that article has, accordingly, found a use in the present one.

Why the majority of the examples are taken from Northern family

The majority of the examples are taken from the Northern Family of languages, not because they were better suited for my purposes, but simply because they were available to me. But even here I laboured under many disadvantages, as I had no opportunity of consulting the works of Pallas, one of the very few naturalists who collected the names as well as the plants and animals themselves. This was also the case with Schrenk's travels, and many others which it is unnecessary to mention. It is on this account as well as the very great diversity of the materials, which, although scanty, cost much labour to collect, that I wish to direct attention more to the ideas which I have desired to put forward, than the materials which I collected to illustrate them. I only wish, in conclusion, that some one better qualified and more advantageously circumstanced would undertake the complete analysis of the Magyar in the way pointed out, as I have no doubt that the problem of the origin of that race can be determined by this method and by no other.

The author directs attention more to the ideas put forward than to the examples.



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tions sufficiently considerable to offer impediments to the currents of wind: the forms of the isothermal lines will undergo important changes. If these eminences are scattered around the coast, their influence shall be greater than if they were all concentrated towards the interior of the island; for, in the former instance, they will present a kind of barrier, more or less broken, between the air resting on the central plains and the air outside covering the ocean. The sea breezes will no longer exercise the same effect on the portions of the interior situated behind the mountains, while their influence will remain unchanged, or be even increased, on the portions still unscreened from the ocean. A corresponding change must, therefore, take place in the forms of the isothermal lines. They should approach the coast at the parts screened by the mountains, while they should remain stationary, or sometimes recede towards the interior, at the intervals between the mountains. If the interior of the island does not consist entirely of dry plains, but is covered with lakes and considerable areas of undrained marshy land, such evaporating surfaces will cool the surrounding air. If the evaporating surfaces be concentrated chiefly about the centre of the island, their influence will not be much felt at the coast, and thus, although they may produce some local changes in the forms of the isothermal lines in their neighbourhood, their most important effect will be to render still more decisive the differences of temperature on a line drawn from the coldest region at the centre to the coast; in other words, to contract or enlarge the dimensions of some of the isothermals.

3.

If the influence of the differences of latitude of the surface of the island be now considered, it can be demonstrated that its tendency will be to transport the centres of the isothermals towards the pole, in whatever hemisphere the island may be situated, and that the isothermals at the centre shall be more affected from this cause than those at the coast. Let us suppose, for precision, the island in the northern hemisphere.

Let us at first abstract the effect of all other sources of terrestrial temperature but solar radiation, and consider the proportions of heat that may be received by two elements of the surface of the island included between two adjacent isothermal lines. It will suffice to determine the quantities for the spaces included between each of their northern and each of their southern extremities respectively. From the great distance of the sun, its rays may be supposed nearly parallel, and from the limited area we are considering, the Earth's figure may be supposed perfectly

spherical. By the laws of radiant heat, the amount of heat received by an element s of the surface of the Earth, will be represented by²

$$\frac{sG \cos \phi}{R^2}.$$

G being a coefficient, independent of the state of the Earth's surface, and expressing the amount of heat that passes from the sun to a unit of surface placed perpendicularly to the direction of the sun's rays at a certain unit of distance, ϕ , the inclination of the sun's rays to a perpendicular to the plane of the element s of the Earth's surface, and R , the radius of the Earth's orbit. But

$$s = a^2 \cos \lambda d \lambda d \mu,$$

where a is the Earth's radius, λ the latitude of the point where the element s is situated, and μ its longitude. But in the spherical angle whose sides $\frac{\pi}{2} - \delta$, $\frac{\pi}{2} - \lambda$, include the angle ψ , which subtends ϕ , we have

$$\cos \phi = \sin \lambda \sin \delta + \cos \lambda \cos \delta \cos \psi,$$

where δ is the sun's declination, and ψ an angle depending on the hour of the day, being included between the meridian of the element and that of the sun. The problem now before us, being connected with the proportional quantities of sunshine received by different elements and not with the absolute amounts, we may in a first approximation consider these quantities as proportional to the amount received at noon; consequently for a limited area of the sphere the quantity of heat received in the time dt is proportional to

$$\frac{Ga^2}{R^2} \iiint \cos (\lambda - \delta) \cos \lambda d \lambda d \mu d t.$$

But if u represents the mean longitude of the sun, and P the parameter of the Earth's orbit, we should have

$$R^2 du = \sqrt{P} dt.$$

But also

$$\sin \delta = \sin i \sin u,$$

i being the inclination of the equator to the ecliptic: therefore the above expression becomes

$$\frac{a^2 G}{\sqrt{P}} \left\{ \iiint \cos^2 \lambda \sqrt{1 - \sin^2 i \sin^2 u} du d \lambda d \mu \right.$$

² Poisson *Théorie Mathématique de la Chaleur*, No. 210.

$$- \iiint \sin i \sin u \sin \lambda \cos \lambda d u d \lambda d \mu \}$$

The limits between which the integrations for μ and λ are to be effected, will depend on the figure of the surface under consideration. For simplicity, let it be an extremely small portion of the surface of the island included between two meridians, so close to each as to include a nearly rectangular space between their segments and those of the two isothermal lines. If m be the breadth of the rectangle, we may take μ from 0 to m , and λ from λ_2 to λ_1 , λ_1 being the latitude of the northern extremity of whichever of the isothermals is nearest the coast, and λ_2 the latitude of the northern extremity of the other isothermal. The area under consideration will be $m(\lambda_1 - \lambda_2)$. The sun's longitude u must be taken from 0 to 2π in estimating the amount of solar heat received during a year.

4.

The heat received by the element $m(\lambda_1 - \lambda_2)$ from the influences of causes, independent of direct solar radiation, will, as already stated, be a function of the distance of this element from the coast; it will therefore be a function of the difference of its latitude and that of the nearest point on the coast. If we make $\lambda_1 + \lambda_2 = 2\Lambda$, and represent the latitude of the northern part of the coast nearest the element of surface by l , we shall have for H the proportion of heat received by the element during a year, the expression

$$H = f(l - \Lambda)$$

$$\frac{a^2 Gm}{2\sqrt{P}} \left\{ \left[\frac{1}{2}(\sin 2\lambda_1 - \sin 2\lambda_2) + \lambda_1 - \lambda_2 \right] \int_0^{2\pi} \frac{2\pi}{\sqrt{1 - \sin^2 i \sin^2 u}} du \right. \\ \left. - \frac{1}{2} (\cos 2\lambda_2 - \cos 2\lambda_1) \sin i \int_0^{2\pi} \sin u du \right.$$

The second of these integrals vanishes between the limits, and the first may be determined by the properties of elliptic functions for

$$\int_0^{2\pi} \frac{2\pi}{\sqrt{1 - \sin^2 i \sin^2 u}} du = 4 \int_0^{\frac{1}{2}\pi} \frac{\frac{1}{2}\pi}{\sqrt{1 - \sin^2 i \sin^2 u}} du \\ = 4E(i).$$

$E(i)$ representing a complete elliptic function of the second



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extremity from the northern coast less than the distance of its southern extremity from the southern coast. The same result will affect the next adjacent isothermal, and so on in succession, so that ultimately all the isothermal lines will be transported towards the north.

As

$$C(1 + \cos 2\Lambda) = 2C \cos^2 \Lambda,$$

The heat received at any point of the Earth's surface from solar radiation alone, abstracting the influence of atmospheric absorption in different latitudes, varies in conformity with Mayer's Law as the square of the cosine of the latitude.

The more the influence of latitude predominates over all other causes, the more will the positions of the isothermals be changed in the manner above indicated: it follows, therefore, that while towards the equatorial coast of an island these lines terminate on the coast, they may still continue as closed curves in the interior of the island. If the influence of differences of latitude was greatly predominant over all other climatic influences, all the isothermals may terminate on the coast.

5.

The quantity of heat received by a given small area during the summer and winter half-years, between the spring and autumnal equinoxes, may be readily found by integrating with respect to u , within the limits 2π and π , and afterwards within the limits π and 0. Thus we shall have the general expression

$$\frac{a^2 G m}{P^{\frac{1}{2}}} \left\{ [\cos(\lambda_1 + \lambda_2) \sin(\lambda_1 - \lambda_2) + \lambda_1 - \lambda_2] E(i) \right. \\ \left. \pm 2 \sin i \sin(\lambda_1 + \lambda_2) \sin(\lambda_1 - \lambda_2) \right\} \quad (4)$$

the term affected by $2 \sin i$ is to be taken with the positive sign for that half of the year during which the sun is at the same side of the equator as the area in question, and the negative sign for the other half of the year. If $\lambda_1 - \lambda_2$ be so small that its square may be neglected, then for the small area $s = m(\lambda_1 - \lambda_2)$ we shall have the amount of solar heat H_1 received during either half year expressed by the equation

$$H_1 = K (E(i) \cos^2 \Lambda \pm \sin i \sin 2\Lambda), \text{ making } K = \frac{2a^2 G s}{P^{\frac{1}{2}}} \quad (5)$$

$\sin 2\Lambda$ is always positive, as Λ cannot exceed 90° , it follows, therefore, that the influence of latitude on the points of the isothermals will be greater during the summer half of the year than

during the winter half; and therefore, all other things remaining the same, the isochimenal lines, or lines of equal winter temperature, would be less displaced from their concentric position in an island than the isothermal lines, or lines of equal summer temperature.

From the preceding expression we can determine the latitude of the parallel which receives the greatest amount of solar heat during the summer half of the year. For on differentiating we have

$$\frac{dH}{d\Lambda} = K(\sin i \cos 2\Lambda - E(i) \sin 2\Lambda),$$

This equated to zero gives

$$\text{tang. } 2\Lambda = \frac{\sin i}{E(i)} \quad (6)$$

Also,

$$\frac{d^2H}{d\Lambda^2} = -2K \left\{ \sin i \sin 2\Lambda + E(i) \cos 2\Lambda \right\}$$

If in (6) we substitute the values of $E(i)$ and $\sin i$ respectively, we shall find $\Lambda = 7^\circ 24'$ nearly, $\cos 2\Lambda$ and $\sin 2\Lambda$ will

both be positive, and therefore $\frac{d^2H}{d\Lambda^2}$ negative; the above value of $\text{tang. } 2\Lambda$, gives therefore a maximum value to H , and consequently the parallel which receives the greatest amount of solar heat during the half year that the sun is at the same side of the equator, is the parallel which has the latitude $7^\circ 24'$.

6.

The results of these investigations become applicable to the two great continents of the eastern and western hemispheres; for as these are both completely surrounded by water, they may be considered as two immense islands. The distance from the ocean of the greater part of their surfaces, diminishes so much the action on their general climate of the waters by which they are surrounded, that the influence of difference of latitude becomes, as a general rule, predominant over all other causes, and the centres of most of their isothermal lines are transported so far towards the pole, that many of these lines circumscribe the Earth's axis, or lie in surfaces which cut that axis more or less obliquely.

In the interior of a continent, an elevated table-land of limited dimensions is circumstanced nearly in the same way as an island, for its edges are surrounded with air having a mean temperature nearly uniform, and different from that lying on its sur-

face. We may therefore expect to find, even in the interior of continents, closed isothermal lines, as well as in the interior of oceanic islands.

The disturbing action of general winds will modify the forms of the isothermal lines, according to the frequency and the temperature of these winds. The warm winds will cause the isothermals to recede from the coast towards the interior in a direction opposed to that from which they emanate; the cold winds will, on the contrary, cause the isothermals to advance towards the direction from which they blow. We may, therefore, conceive the tendency of such general winds, when warm, to be to remove the centres of the isothermals from the points whence they blow; when cold, their tendency will be to approach these centres towards the same points. If we compound these tendencies with the effect of differences of latitude, we would have the resultant direction towards which the isothermal lines should be displaced from their concentric position by the action of all these disturbing causes.



ART. VII.—*On Terrestrial Climate as influenced by the Distribution of Land and Water during different geological epochs.*
By HENRY HENNESSY, F.R.S.

EVERY point on the Earth's surface is continually gaining and losing heat, and its actual temperature at any given moment depends on the difference between its gains and its losses. If the outer coating of the Earth were exclusively composed of solid materials, terrestrial climate would depend principally on the heat gained from sunshine and the heat radiated into space. But as the Earth is completely enveloped by an atmosphere, and partly surrounded by a liquid, its thermal conditions must be greatly influenced by the physical properties of these fluid coverings. While the heating or cooling of a solid follows the clearly defined, and comparatively well understood, laws of conduction and radiation, the heating or cooling of gases and liquids is further greatly modified by the mobility of their particles. The changes of state which frequently take place in fluids, whether by evaporation or condensation, freezing or liquefaction, introduce agencies which still further complicate the study of their thermal relations.



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the forests of South America, are all necessary consequences of the energy of the actions and reactions by which the outer coating of the Earth loses the warmth it has acquired from sunshine during the day. Conversely, the almost constant temperature of the sea in tropical regions, by day and night, and the nearly total absence of dew on the rigging of vessels far removed from the land, clearly show the peculiar retentiveness of heat possessed by the water, and that, unlike the land, it does not readily part with whatever warmth it may have acquired from sunshine during the day. The cold southerly breezes sometimes observed in Egypt during the winter months,³ when the air has passed over immense surfaces of sandy desert, present a striking contrast to the south-westerly winds which at the same season traverse the ocean and visit our shores. While the feeble conducting power of the solid portions of the Earth's coating, allows but a small portion of the sun's heat to pass beneath the surface, so that whatever warmth is thus received on that surface during the day is readily radiated into space during the night, a liquid mass, similarly exposed to sunshine and subsequent nocturnal radiation, possesses peculiar properties which greatly influence the differences between its thermal losses and gains. The most important of these properties are, (1) the great capacity of water for heat, by which it gradually accumulates and slowly parts with whatever warmth it has received; and (2) the immobility of its particles, by which exchanges of temperature in different parts of the liquid mass are essentially promoted.

Let us consider the effect of the sun's rays on a globe covered with water, and we shall soon perceive that a more energetic process than that of conduction accompanies the exchanges of temperature between the different portions of the fluid. The water which receives the vertical rays of the sun will be more heated than the waters which receive its rays at more oblique inclinations. Not only the amount of warmth received over a given area, but also the depth to which the rays of heat penetrate below the surface, depends upon the angles made by these rays with the vertical. Inequalities of surface temperature, depending on the latitude, the hour angle, and the sun's longitude, should thus result. The more heated waters would expand, and tend to spread over the cooler waters in other regions. Currents should arise from the mutual actions and reactions of the unequally heated portions of the fluid. The colder currents would usually tend to flow beneath the warmer, unless at temperatures approaching that of the maximum density of

³ Kaemtz *Météorologie*, French edit. p. 45.

water, and thus a process of circulation would be established by which the temperature acquired by the superficial strata of the water should be ultimately propagated to a certain depth below the surface. Evaporation would also take place, and by the condensation of vapour a certain portion of the heat received by the water would be imparted, in the formation of clouds, to the superincumbent atmosphere.

If, as in the existing oceans, this water be salt, the inequalities of temperature producing inequalities of evaporation, will also produce diversities in the density of the water in different regions, and thus additional energy will be imparted to the process of circulation. The salter and heavier surface water will tend to sink into the colder liquid which lies beneath, and which shall naturally tend to take its place, by ascending upwards.⁴ The process of evaporation would cool the surface of the water; but, unlike that of radiation, it is not altogether a losing process as far as the entire surface of the Earth is considered; for it is sooner or later followed by condensation, whereby the greater part of the absorbed heat is again returned. When a piece of land or water parts with its heat by radiation into space, that warmth can never be restored to any part of the Earth's surface; but whatever heat the water loses by evaporation, becomes latent in the vapour so produced, and is ultimately transferred by condensation to some other part of the globe; and hence evaporation does not constitute an agent in causing a diminution of general terrestrial temperature. Let us now suppose a sheet of water at the equator nearly surrounded by fixed boundaries, so as to form a species of immense lagoon. Its temperature, from the causes here referred to, will rapidly augment. The heat which it has acquired during the day shall have penetrated so deeply as to be incapable of being radiated backwards into space during the night, with the same facility as on the surface of a sandy plain or from the summits of a mass of vegetation. Its temperature should thus continue to accumulate up to a certain limit imposed by the conditions of evaporation, and it might ultimately attain a mean temperature superior to any which is now met at the surface of intertropical seas.

3.

These views are strikingly illustrated by the phenomena accompanying the origin of the Gulf Stream. The mass of water which rushes into the Gulf of Mexico, along the southern

⁴ See Maury, *Physical Geography of the Sea*, p. 160.

shores of the Caribbean Sea, has already acquired a certain elevated temperature from the action of sunshine in the southern torrid zone in its passage from Cape St. Roque. In moving around the Caribbean Sea and the Mexican Gulf, these waters still continue under the influence of a tropical sun, and are constantly increasing in temperature. The islands and coasts which they happen to bathe, have no part in directly promoting this augmentation. On looking over the isothermal chart of the Caribbean Sea and Gulf of Mexico, prepared by M. Charles Deville,⁵ it becomes manifest that in general the temperature decreases in going towards the land. In some places the mean annual temperature of the water close to the land is $24^{\circ}.5$ centigrade; further out at sea it is 25° , and still further from the land it is $25^{\circ}.5$. In other places it gradually augments from 26° , in going from the land, up to $27^{\circ}.4$.⁶ These results are unconnected with the influence of latitude, and they are still less explicable by the influence of centrifugal force, in driving the cooler and heavier waters towards the edges of the great current, in its semi-rotatory movement around the gulf. For in this case the law of decrease of temperature in going from the land, should not hold on approaching the coasts of large islands situated towards the centre of the moving mass of waters. But, in such instances, it is also manifested; for on the north and south coasts of the Island of Cuba we find the isothermal lines of $26^{\circ}.2$ and $26^{\circ}.5$, while the isothermals of $26^{\circ}.7$ and $26^{\circ}.8$ are situated outside them respectively.⁷ In M. Deville's chart these are closed isothermals, similar to those which I have indicated on the surface of the British Islands; but as the lowest isothermals in my map are the most remote from the sea, those in his chart which exhibit the highest temperature are farthest from the land. It is thus apparent that the intertropical sea may become a storehouse of heat, by retaining much of what it receives from the sun, which, but for the physical properties of water, it would, like the intertropical land, lose by radiation into space. It is important to bear this conclusion in mind in any inquiries respecting the influence of the distribution of land and water on general climate, especially as the influence of the land seems to have been hitherto principally considered as a calorific agent.

The heating action of intertropical land has been so often dis-

⁵ *Annuaire de la Société Météorologique de la France*, tom i., p. 160.

⁶ Reduced to degrees of Fahrenheit's scale, these numbers, arranged in the same order as in the text, are $76^{\circ}.1$, $77^{\circ}.0$, $77^{\circ}.9$, 78.8 , $81 .3$.

⁷ Equivalent respectively to $79^{\circ}.16$, $79^{\circ}.7$, $80^{\circ}.06$, and $80^{\circ}.24$ of Fahrenheit's scale.



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and small. If all the dry land on the globe were collected into a single vast continent, the climatological conditions of the Earth, all other things remaining the same, would be very different from what would take place if the land were broken up and spread out in numberless islands. Whatever may be the supposed distribution of land and water, it is manifest that its chief influence on the general temperature at the surface of our planet, should result from the action of aerial and oceanic currents.

In the first case above referred to, the belt of equatorial ocean would probably acquire a high temperature, and although the circumpolar islands would possess very rigorous climates in their interior, portions of their coasts might be washed by heat-bearing currents, just as the north-western coast of Europe is washed by the Gulf Stream at the present day. The superiority of mean temperature of the ocean might, in this case, be so great that the distribution of heat over the islands should present remarkable instances of the laws found to hold good in the British Isles, and almost all of the isothermals on the land would be closed curves.⁹

In the second case, the ocean would acquire much less heat from the sun, and it would exercise a cooling influence on the belt of intertropical land. But as whatever evidence we possess seems to indicate that intertropical seas owe their elevated temperature not so much to the influence of thermal exchanges with the air which has passed over the adjacent land, as to the direct influence of sunshine, we may conclude that upon the whole the heat-bearing currents would, in this case, be less influential than in that which has been just considered. The heated air flowing from the equatorial land should, by the agency of winds, in some measure mitigate the temperature of the polar regions, but we have no reason for believing that this influence would be superior to that of the heat-bearing water currents in our former instance.

If now we suppose the land to be equally distributed in islands between the equatorial and polar regions, we shall have conditions more or less favourable to the existence of oceanic as well as of aerial heat-bearing currents, and it seems not impossible that, under such circumstances, the entire surface of the globe may enjoy the highest possible amount of general warmth by being best circumstanced for the accumulation, retention, and distribution of the heat it receives from the sun. In this case, as well as in the first which has been considered, warm

⁹ See *Atlantis*, No. ii. p. 399.

currents from the equatorial seas might freely bathe the coasts of islands in higher latitudes, thus producing similar characteristic cases of insular climate. The mean temperature of such seas being higher than that of the air over the land, the isothermal lines of the islands should be partly or entirely closed curves, having shapes dependent upon the outlines of the islands. The greater the difference of atmospheric and water temperature, the more strictly should the isothermals conform to this law. Thus it is manifest that a nearly circular island, with a surface equal to that of Labrador, and lying in the same latitude, would present a much greater diversity of climate between its interior and its coasts, if the latter were bathed by sea water having a temperature of 80° Fahrenheit, than if that temperature amounted only to 40°. As the manner in which the warm air over the water would exchange its heat with the air over the land should take place undoubtedly by circulation, it would not be easy to assign a distinct law for the difference of temperature between the interior and the coast of the island; but it seems evident that this difference should, up to a certain limit, increase with the temperature of the heat-bearing oceanic currents. A group of islands situated in high latitudes, and surrounded by currents possessing a high temperature, while receiving but a small amount of heat from sunshine, should present a series of closed isothermals, and while their interiors would be cold, their coasts might enjoy an extremely genial climate.

5.

If such conditions existed at former geological epochs, we may fairly expect to find some evidence of their existence by comparing the characters of the organized beings by which the interior and the coasts of such islands were inhabited. Such geologists as have hitherto studied the diversities in structure of the fossil remains which have come under their notice, appear to have attended principally to the climatic influence of the elevation of the interior parts of such islands. Professor Ramsay,¹⁰ in his memoir on the denudation of Wales, after pointing out the great elevation above the sea, which portions of that region had formerly possessed, calls attention to the resulting varieties of climate that must have prevailed. "If", he says, "the climate of our latitudes, when the coasts were washed by the new, red, and liassic seas, were tropical, as is generally supposed, still on the heights indicated on the vertical sections, we have ample space for tropical and temperate zones, each probably abound-

¹⁰ *Memoirs of the Geological Survey of Great Britain*, vol. i. p. 324

ing in its own appropriate forms of life. And here, in connection with this subject, it may be remarked, that in Mr. Brodie's recent work, 'A History of the Fossil Insects of the Secondary Rocks of England', it has been stated that, with certain exceptions, the minute size of the great mass of the insect remains seems to indicate a very cold, or at all events, a temperate climate".

This appeared to Professor Ramsay not to be in harmony with the other fossil evidence, which proves that most of the creatures whose remains are preserved in the strata of the secondary series inhabited a tropical climate. If the interior temperature of the land, whose inhabitants apparently existed under such different conditions of climate, depended not only on the coördinate of height above the sea, but also on that of distance from the coast, in the manner here described, a more complete explanation would be afforded of these remarkable phenomena. The discovery by Mr. Strickland, in the alluvial sand of Worcestershire, of the bones of a hippopotamus, accompanied, not only by the bones of other mammalia, but by twenty-three species of fresh water and land shells, of which nineteen are existing British species, seems to show that, even at a period so recent as that of the deposit from which these remains were taken, remarkable differences of climate may have existed over a comparatively small area of land.¹¹ The strong presumptions furnished by the fossil flora, and other evidences connected with the history of earlier geological formations in favour of the existence of numerous islands scattered over an ocean enjoying a tropical temperature, should lead us to expect more of such results as are here noticed, instead of feeling surprise at the discrepancies which they seem to exhibit.

6.

I shall now attempt to illustrate some of the preceding general views from the actual condition of the Earth's surface. The higher mean temperature of the northern, compared to the southern hemisphere, is clearly proved and universally acknowledged. This superior warmth is usually ascribed to the greater amount of land in the former compared with the latter. It has been apparently assumed that the surface of the dry land exercises upon the whole a far more energetic influence, in tending to elevate the mean temperature of the earth, than the surface of the water, and this action is generally ascribed to the superior

¹¹ Geological Society's Proceedings, June, 1834, p. 94; and Lyell, p. 76, 9th edition.



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Malacca and the island of Mindano; thence through the Pacific, until it meets South America, the northern portion of which it traverses from a point near the Gulf of Panama to another between the mouths of the Orinoco and Esiquibo. In the opposite hemisphere, the parallel of maximum southern sunshine crosses Africa from a point north of St. Paulo de Loando to another near the Monfeca islands. It traverses a great part of Java, New Guinea, and smaller islands. It crosses South America almost on the line of greatest breadth, from near Truxillo to a point north of Pernambuco. On comparing the extent of land and water lying under the parallel of maximum half-yearly sunshine, it appears that the proportions are nearly the same in both hemispheres, although a very slight excess of land appears to lie under the southern, compared to the northern parallel.¹³ Outside the torrid zone, the proportions of land and water belonging to each hemisphere respectively are extremely different: while nearly half of the surface between the pole and the tropic of Cancer is land, by far the greater portion of the area between the southern tropic and the pole is water. In the arctic and antarctic regions land and water alternate in nearly corresponding proportions. The great difference between the areas of land and water of the northern and southern hemispheres exists in the temperate regions. Upon the whole, it may be concluded, that there is a comparative predominance of land over water in the higher latitudes of the northern hemisphere, while the opposite condition holds in the southern hemisphere. If the presence of dry land in high latitudes is favourable to a cold climate, this condition appears to be more completely manifested in the northern than in the southern hemisphere; and if the presence of a certain amount of dry land within the tropics is favourable to a high temperature,² that condition is almost equally well fulfilled at both sides of the equator.

Let us conceive all the land north of the equator to be submerged, and its place to be supplied, first, by a mass of land in the north tropical zone, exactly similar in area and configuration to that touching it in the southern zone. Let the arctic regions of North America, Nova Zembla, and Greenland be replaced by an island similar to Victoria Land, and let a few scattered islands replace the greater part of Asia, Europe, and North America: we shall then have a globe with a considerable belt of equatorial land, while the polar and temperate regions will be

¹³ See the preceding Article, on the laws which regulate the distribution of isothermal lines, § 5.

occupied chiefly by water. We should thus have a state of things approximating much more to the conditions required for a high terrestrial temperature than the present distribution of land and water. Yet the distribution here supposed for both hemispheres would be precisely what at present exists in the colder of the two; and we should thus have the paradox of warming the entire globe by modelling its warmer hemisphere after its colder. Unless the influence of Victoria Land as a refrigerator of the southern hemisphere should be greater than that of the immense masses of land in the northern parts of the new and old continents, this paradox would seem inexplicable on the theory under consideration. But it can be in some measure explained, if the agency of oceanic currents in storing up and transporting the heat acquired from sunshine be fully admitted. In the actual state of the Earth's surface, the form of the basin of the South Atlantic Ocean, combined with other physical conditions, seems to determine the transfer of a great volume of heated water from the southern intertropical regions to the northern hemisphere, which, passing subsequently through the Caribbean Sea and Gulf of Mexico, acquires a still higher temperature, and ultimately confers its warmth on regions in high northern latitudes. From the direction of the currents of the Pacific, as laid down on some of Maury's charts, it is probable that a similar transfer northwards of heated southern intertropical water is effected in that great ocean as well as in the Atlantic. The general result is, that the southern hemisphere is not only deprived of a certain amount of the solar heat absorbed by its waters, but that the temperature of the northern hemisphere is augmented to a corresponding amount. But although the paradox alluded to may be thus explained, this result shows the danger of underestimating the agency of aqueous currents in connection with any theory of the distribution of land and water that may be proposed in order to explain vicissitudes of terrestrial climate.

7.

In examining the consequences resulting from the suppression of the Gulf Stream on the climate of western Europe, with reference to the question of glacial action at former geological epochs, as has been done by Mr. Hopkins,¹⁴ we need only direct our attention to what actually takes place at corresponding latitudes in the southern hemisphere. In these regions, there is not only an absence of such an active calorific agent, but even an

¹⁴ Quarterly Journal of the Geological Society, 1852, p. 85.

abstraction of some of the heat due to them from the sunshine which falls upon a portion of their oceans, which heat we have seen is transferred to the northern hemisphere. Glaciers consequently descend to the sea, not only about the latitude of 54° S., as observed by Captain Cook, but even so close to the equator as $48^{\circ} 30'$ S., where they were noticed in great abundance on the western coast of South America by Mr. Darwin.¹⁵ He even observed one instance of a glacier reaching the sea in the latitude of $46^{\circ} 40'$, which corresponds to that of Napoleon Vendée, in the west of France. The existence of glacial action in the southern latitudes, equivalent to those of the temperate regions of western Europe, suggests the possibility, that by an inversion of the operating causes, the southern hemisphere might have enjoyed a milder climate at the same geological period when glacial phenomena were most completely developed north of the equator.

8.

While fully acknowledging the important influence which changes in the distribution of land and water may exercise on terrestrial climate, we are not precluded from studying the action of other causes, and of giving to them such weight as the evidences in their favour may render advisable. If, from the results of astronomical as well as of geological testimony, we are induced to believe that the Earth has been for ages slowly cooling from a state of former incandescence, its climate during the earlier epochs of its physical history must have been more or less influenced by the heat thus passing outwards through its crust. However efficient, as applied to recent phenomena, we may find the theory of geological climates that explains the variations of the Earth's superficial temperature by changes in the distribution of the liquid and solid portions of its outward coating, it seems by itself incompetent to rationally and consistently account for the very high temperature which must have prevailed during remote epochs of the Earth's history. If we reject the evidence on which it has been concluded that the Earth has slowly cooled from a fluid incandescent state into its observed condition, and admit that the Earth's spheroidal shape was due to gradual and even existing causes, and not to the mechanical consequences of its primitive and universal fluidity, we shall arrive at a conclusion which, on the supposition of the complete adequacy of superficial causes to explain all changes of climate, would lead to the inference that, from very re-

¹⁵ Voyage of Adventure and Beagle, iii. p. 282.



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There is much speculation in geology, and much room for differences of opinion, in respect of countries in which the usual succession of the sedimentary rocks is interrupted by protrusions of igneous ones, or broken up by faults. I may be wrong in the view I take of what I believe to be errors; he may be wrong in his interpretations of some of the facts which are presented to observation. Where there is a difference of opinion, it must be beneficial to discuss the matter further, with a view to have the points in dispute settled one way or the other.

Men are never so likely to settle a question well, as when they discuss it freely. It is in this, as in mathematics, when once a proposition has been demonstrated, it is never afterwards contested. It is to be hoped, however, that in all our differences of opinion, we may have no other motive but that of establishing the truth, and no other end but the good of geology.

On the Geological Map of Ireland the relative position of the rocks, as the author interprets them, are represented by colours; but as this map cannot be laid before every eye, it is necessary to take advantage of any letter-press description he has given, which may be available.

§ 1.

The calp.—Last year I read a paper before the Dublin Geological Society, on the supposed calp of Ireland, which is printed in their Proceedings.¹ In that paper I argued that there is no such rock in Ireland, but that what was thus named had been made up of parts of other subdivisions of the carboniferous formation. The author of the Geological Map, who was present at the reading of that paper, stated that some of the narrow bands of calp, in Sligo and Mayo, against which I had been arguing, had been omitted on the last edition of the map. This was a step in the right direction. He promised at the same meeting to put in writing whatever observations he had to make in answer to my paper. That answer was read at the April meeting, and is now printed.² It gives a history of geology in England and Ireland from its earliest days, and of the calp in particular, and refers to all the papers that he had read on the subject at meetings of the British Association at Liverpool in 1837, at Manchester in 1842, and at Cork in 1843; it likewise contains many quotations from those papers, all of which are simple reiterations of the same views. If such quotations extended to a volume, they would not add a single new argument in support of his views.

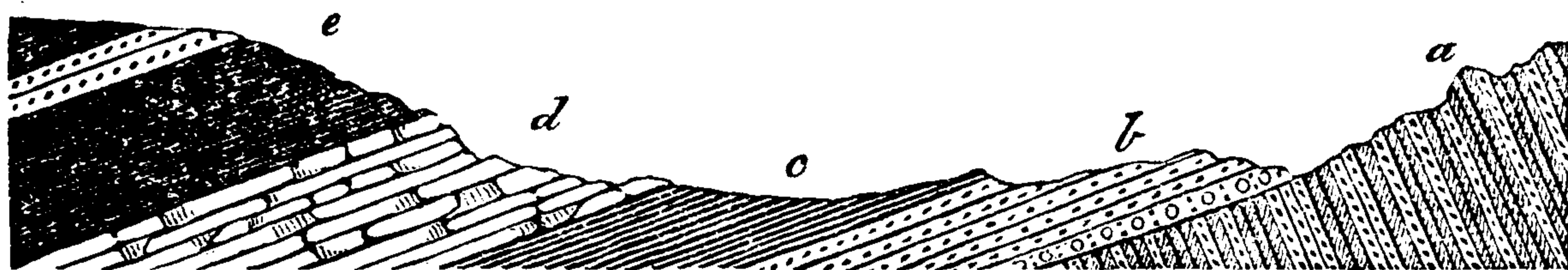
¹ Journal of Geological Society of Dublin, vii. 222.

² *Ib.*, p. 267.

I consider it quite unnecessary to reply in detail to those several extracts. They all have reference to the supposed calp of Ireland; and if I succeed in showing that there is no calp, in Sir R. Griffith's sense, the whole of them fall to the ground. If I fail in showing this, all the arguments I can adduce are of no value, and, of course, only go to establish the calp theory as it has been promulgated. And here I may observe that I have no objection to the term calp, as first used by Kirwan, that is, as a lithological distinction for certain beds of black impure limestone.

For the benefit of persons who may not have seen those papers, I will state shortly, that the supposed calp is a subdivision of the carboniferous system introduced for the first time into geology by Sir R. Griffith. The succession of the carboniferous groups, before its introduction, was—1. Old red sandstone; 2. Carboniferous slate; 3. Limestone; 4. Coal measures, as shown in fig. 1. The succession at present is made to con-

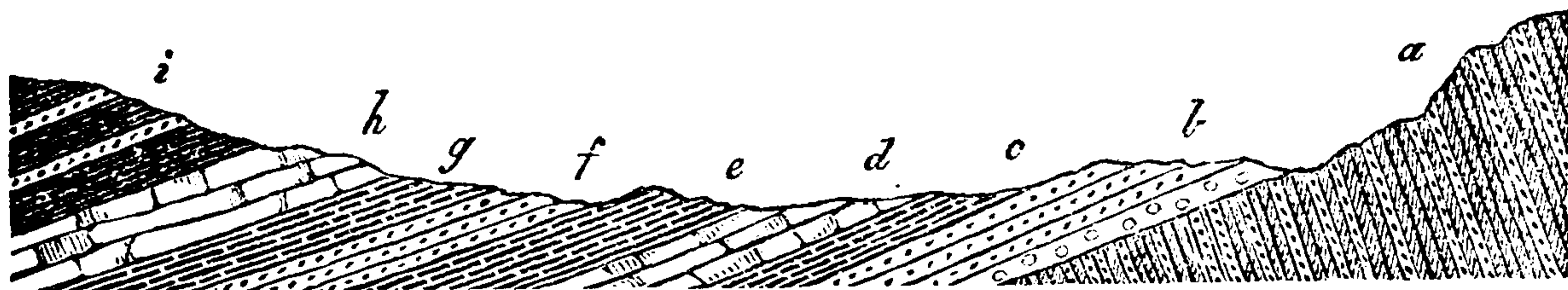
Fig. 1.



a. Silurian rocks. b. Old red sandstone. c. Calciferous slate.
d. Limestone. e. Coal measures.

sist of—1. Old red sandstone; 2. Yellow sandstone; 3. Carboniferous slate; 4. Lower limestone; 5. Lower calp shale; 6. Calp sandstone; 7. Upper calp shale; 8. Upper limestone; 9. Coal measures—as seen in fig. 2. But these nine subdivi-

Fig. 2.



a. Silurian rocks b. Old red sandstone. c. Calciferous slate. d. Lower limestone.
e. Lower calp shale. f. Calp sandstone. g. Upper calp shale. h. Upper limestone.
i. Coal measures.

sions are again split up into thirty-eight smaller ones on the Geological Map. I shall have a few words to say upon these minute subdivisions hereafter.

The calp occupies four large districts in Ireland, containing above 1,800 square miles. In my paper, above alluded to, I endeavoured to show that the first of these districts, about Bundoran, is old red sandstone and calciferous slate, and that the

other three, that is, the Slievebeagh district in Monaghan, the Dublin and the Galway districts, belong to the coal measures.

This calp is said to be 1,700 feet thick, composed of two shales, with a sandstone between them. The shales and the sandstones exist; they are plainly to be seen in many parts of the country; but the relative positions assigned to them is erroneous. I shall endeavour to account for how this has happened. In the carboniferous formation there are two black or gray shales—one below the main mass of the limestone, called carboniferous slate, and one above it, called millstone grit, or, as it is sometimes called, coal shale; because in this country it forms the base of the coal measures. There are two sandstones also—the old red below, the top of which is yellow or white, and the sandstone of the coal measures above, which consists of several bands, and which are also yellow or white, and separated by black shales. These sandstones are all difficult to be recognized. When one of them is found in a detached position, and the continuity with other members of the series is broken off by faults, by drift, or by water, which is a common occurrence in the north of Ireland, it has been often mistaken for the other. The two shales, in like manner, have been mistaken for one another. They are much alike in general aspect and colour, but yet they have individual characters, both lithological and paleontological, by which they can be recognized by a practised eye and close observation, and each assigned to its proper place in the system. It is owing to the want of this observation that the confusion has arisen, and the calp made up out of those mistakes.

The name, carboniferous slate, given to this subdivision in Ireland for the last few years, appears to me to be objectionable. All the slates and shales of the so-called carboniferous formation, are carboniferous slates and shales, those above the limestone in the millstone grit, as well as those below it; and such a general term is not truly applicable to any particular part of the system. Indeed, the term carboniferous, given to this system on account of the coal it contains, is not likely to stand; for coal, though long known in the oolitic rocks at Brora in Scotland, and in Yorkshire, has lately been discovered not only in the oolitic, but in the tertiary rocks. At Richmond in Pennsylvania a bed of coal 40 feet thick is worked, according to Professor Rogers. In the East Indies, in the neighbourhood of the Irawaddy, Professor Oldham told me that he has found a bed of coal 18 feet thick, with many thinner beds. Coal is also found in Cutch. All those in America and India just mentioned are in the oolitic rocks. Important beds of coal have been found in tertiary rocks in Germany and Austria.



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of the limestone is marked on Colonel Portlock's map to be 15° west. I believe this to have been accurately taken, and shall therefore adopt it in this trial.

The distance westward from this spot, across the calp, to the nearest edge of the millstone grit on Belmore Mountain is six miles, or 31,680 feet. From these data, by an easy process in trigonometry, may be obtained, as the depth under Belmore and below a horizontal line passing through the surface of Lough Erne, 8,483 feet. Belmore Mountain itself is 1,312 feet high, Lough Erne is 150 above sea level; the difference, 1,162 feet above the horizontal line, is to be added to the 8,483 feet below it; this makes the whole vertical depth from the summit of Belmore Mountain to that point in the plane of the bedding of the limestone passing through the above-mentioned point near Devenish Island, to be 9,645 feet. This includes part of the lower and the whole of the upper limestone. Let us suppose it to be 1,000 feet in that locality, and deduct it from 9,645, we have 8,645 feet for the thickness of the calp alone between the two limestones, in a vertical line under Belmore Mountain.

It appears to me, from the explanatory section on the map, that the author believed the calp, in the country between Enniskillen and Sligo, to be about of equal thickness; and this might be expected in any member, new or old, of the carboniferous formation, from the well-known general parallelism of its beds. But how stands the matter between Enniskillen and Sligo? Take a triangle having Belmore Mountain, Bundoran, and Drumahaire, at its three angles. The thickness of the calp at Belmore mountain is above 8,500 feet; at Bundoran, the author says, it is 1,700 feet; and at Drumahaire it vanishes to nothing, as seen on the map. There can be no deception or equivocation in these figures, if the calp theory be true, and the dips persistent; that is, if the lower limestone of the west shore of Lough Erne dip under the calp of Derrygonelly and Monea, and that again under the upper limestone of Belmore Mountain, all in regular succession, without the intervention of faults or convolutions. No one will believe that such an enormous mass was deposited in twenty square miles of the carboniferous formation, one remarkable, as just stated, for the parallelism and persistence of its beds. It affords a strong presumption of a blunder in the geological interpretation of the groups of the district.

Of course no one has stated that any such mass exists. I only say that, if the calp theory be true, there is no avoiding the conclusion that it does, and that the dimensions given at the three angles of the great triangle selected, are derived from data

taken from the map and from the letter-press of the "Outline"⁴ Another incredible condition of this visionary block is, that since it reaches 8,483 feet below a horizontal line passing through the surface of Lough Erne, this including a part of the lower limestone, it must be at least 8,000 feet below the level of the sea under Belmore Mountain, while it stands at sea level at Bundoran!

Instead of all this, I believe that the limestone at Enniskillen is the counterpart of that on Belmore Mountain. They once formed a part of the same sheet; but the north and south fault, just described, from Belturbet to Monea, let down the limestone on the east side of it, or tilted it up on the west. It now stands on a low level along the shore near Enniskillen, and is called lower limestone, while that part of it on Belmore is called upper limestone.

The group of hills from Bundoran on the north, to Drumshambo on the south, and between Lough Erne on the east, and Ballysadare harbour on the west, occupies an area nearly circular, about thirty-four miles in diameter. The northern half of this area is composed of a group of high tabular hills, the upper part of which is limestone, ranging from 1,100 to 2,000 feet high. Those hills are separated by deep valleys, or more generally by deep wide ravines. The southern half of the circular area takes in the Connaught coal district round Lough Allen.

I have just described in the vicinity of Lough Erne a great fault, running from Belturbet on the south, to Poulaphooca on the north. It then turns westward to Bundoran, and there enters the Atlantic. Indications of faults appear to continue round near the shore, from this place, by Benbulbin and Knocknarea, to Ballysadare harbour, in a general line of precipices, which, about Sligo Bay, are occasionally detached. This remarkable line of cliffs is not in the original condition of the carboniferous system. It appears to have been subjected to a great amount of disturbance along its northern and eastern boundary. The relative level of the limestone at both sides of the line of cliffs has been greatly altered, either by large areas of the rocks having been let down to the north of them, or tilted up to the south from the original position by violent disruption. The latter was probably the case, as the tabular hills are highest to the north, and decline gradually to the south, where, about Mohill, they repose on the inferior rocks in their original relative position, as I shall show presently.

⁴ Outline of the Geology of Ireland in Report of Railway Commissioners, 1838.

Along this line of precipices on the east and north, the supposed calp is introduced near its base. Let us now compare the northern boundary of our circular area, near Bundoran, with the southern, near Mohill. As just stated, on the northern boundary is a range of high precipices crowned with limestone, and ranging from 1,000 to 2,000 feet above sea level; the south boundary is low and level, standing at about 200 feet high. The north has the so-called calp, composed of sandstone and black shale, all round at the bases of the cliffs, these cliffs clearly indicating violent disruption along their lines. The south has old red sandstone and calciferous slate flanking the Cairn Clonhugh Mountains of grauwacké, and reposing on those old slates and grits at a low angle, apparently as they were originally deposited, from Killeshandra, by Mohill, to Drumod. On the north, it is stated that the basal rock (calp) is 1,700 feet thick. On the west, and a great part of the south, it is totally absent, according to the map;—there is not a trace of it from Ballysadare harbour, by Coolooney and Keadue, to Drumshambo. If the calp be a band of sandstone and black shale 1,700 feet thick, between a lower and an upper limestone at Bundoran and along the north-east, why is there none of it on the south-west? The lower and upper limestones on that side ought to have calp between them as well as at Bundoran, yet there is none between Slievebawn, at Strokes-town, and the Curlew Mountains at Boyle, nor from the north side of the Curlew Mountains at Ballinafad, to the Ox Mountains at Coolooney,—a breadth of limestone of forty miles.

My interpretation of all this is, that the so-called calp on the north at Bundoran,—that is, the sandstone and black shale, exposed at the base of the tilted-up and disrupted precipices,—is old red sandstone and calciferous slate, and the exact equivalents of the old red sandstone and carboniferous slate shown on the map on the south near Carrigallen and Mohill, with this difference, that on the north the carboniferous rocks have been thrown up and the lower groups exposed in the bases of the precipices, while on the south those lower groups lie undisturbed in their original position, dipping at so low an angle as 5° or 10° .

In going from Ballyshannon to Sligo, the traveller beholds on his left the Dartree and Benbulbin Mountains, elevated masses of limestone, broken off by perpendicular precipices wonderful to look at. The beds of rock in these precipices are nearly level, or dip at a small angle to the south; and the fracture in every precipice breaks across through all the beds from bottom to top. The road is pretty near their foot, and the geologist cannot help thinking that those precipices were at one time joined to something else, which extended out to where he sees nothing but



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along the bases of the precipices, I interpret as being the calciferous slate, and the sandstone under it the old red sandstone, as I have already stated—these two forming the supposed calp; and though the black shale or the limestone may appear in more than one locality in the neighbourhood, this is the result of faults which are numerous thereabout.

The black shales and sandstones of the other three calp districts given on the map belong to the coal measures. The Slievebeagh district has a limestone which is surmounted by black shale and sandstone, but has no upper limestone, and in this respect resembles the coal districts of Castlecomer, Kille-naule, and every other. The Dublin district has a lower limestone, then black shales and sandstone, but has no upper limestone. The Galway black shales, etc., rest on a bed of limestone, but there is none over them. There is no upper limestone in any of the three districts comprising upwards of 1,700 square miles of country.

§ 2.

The yellow sandstone.—Other rocks, as well as the supposed calp, also demand an examination.

The yellow sandstone appears to be a special favourite with Sir R. Griffith, and he appears to have taken much pains to establish it as a subdivision of the carboniferous formation. The place in the sequence that he chiefly assigns to it is the top or upper part of the old red sandstone—the rock which lies immediately below the great sheet of mountain limestone in the midland parts of Ireland,—and it is here that its typical character is seen. In the north he calls certain coal measures yellow sandstone, while in the south he calls certain other rocks of much more ancient date, part of the old grauwacké, by the same name. To find out what he truly means by yellow sandstone, if it has any fixed character, we must have recourse to the descriptions given here and there in his writings, and to these I shall make reference in the sequel. The recent portions of those writings are important, as explaining some of his views not known before; they afford fossiliferous evidence which could not be shown upon the map, and other evidence which he has only recently published, and which was but partially known hitherto. The new matter in his papers may be summarized as follows:—

1. He recants his opinion, published in 1838, regarding the geology of the country between Drumquin and Pettigo. He formerly said it was millstone grit; he now says it is yellow sandstone.

2. He relies on some fossils which he obtained from this district, to prove that it is yellow sandstone.

3. He relies on and makes reference to certain sections engraved on the map, and to other sections, especially one, which is assumed by him to show the structure of the country for a distance of fifty miles, to ratify the truth of his views.

4. He describes the scope of the yellow sandstone in the south of Ireland, and especially in the county of Cork.

On the evening that my paper was read to the Geological Society, in March, 1857,⁵ he exhibited sections of fifty miles of country to corroborate his views of the geology of the north-west district. Many think that the construction of a geological section is a proof that the author's views are correct, whereas it is merely a proof that the author's views and the section agree, but none that both may not be highly erroneous. Suppose a case. Give me one or more of those sections to construct. I will adopt the same outline at the top, and the same base line below. Another, *e.g.* Sir R. Griffith, fills up his sections of the carboniferous formation in the locality under consideration with—1. Old red sandstone; 2. Yellow sandstone; 3. Calciferous slate; 4. Lower limestone; 5. Lower calp shale; 6. Calp sandstone; 7. Upper calp shale; 8. Upper limestone; 9. Millstone grit (*see Fig. 2*). I fill my sections here as I do everywhere else with—1. Old red sandstone; 2. Calciferous slate; 3. Limestone; 4. Millstone grit (*see Fig. 1*). He introduces nine subdivisions; I have only four. In this case, it is clear that no two of the sections can agree. What authority, then, is there in sections? If a man's views of the geological succession of the strata be correct, his sections are valuable; if not, they are no better than mere waste paper.

Since there are three different kinds of rocks in Ireland, called by the name of yellow sandstone, I shall divide the country into three districts: the northern, the middle, and the southern; and as every one of these presents circumstances different from the others, they must in each case be accompanied by arguments of a different kind.

NORTHERN DISTRICT.—To begin with the north. In the country lying nearly in a line between Belfast Lough and Donegal Bay, there are three districts of rock marked on the Geological Map as yellow sandstone, all of which I hope to be able to prove to belong to the coal measures. They are—

1. A small district on the south shore of Belfast Lough, at Cultra, in the county of Down.

⁵ Jour. Geol. Soc. Dub. vii. 222.

2 The Valley of Ballinascreen, between Maghera and Draperstown, in the county of Derry.

3. The district between Drumquin and Pettigo, chiefly lying in the parish of Drumkeeran, in the county of Fermanagh.

Evidence by ordinary succession in the two first of those districts is not attainable. I shall, therefore, as best I can, compare the three localities, Cultra, Ballinascreen, and Drumkeeran, with one another.

Cultra district.—In the *Dublin Geological Journal*, vol. i., p. 175, there is printed a paper, by Mr. James Bryce, on the rocks at Cultra. He regards them as the equivalents of the Magnesian limestone of Durham and Yorkshire; and thus, as appears to me, ascribes them to their proper geological position.

This paper was reviewed by Sir R. Griffith in his address as president of the Geological Society, in 1834, printed in the same journal (i., 148), in which he came to the conclusion that the limestone at Hollywood is mountain limestone, like that at Castle Espie, near Comber, and at Armagh. Again, at a meeting of the British Association, at Cork, in 1843, he read a paper “*On the lower portion of the carboniferous series of Ireland*”, in which, referring to a small district which occurs at Cultra, on the east shore of Belfast Lough, in the county of Down, Sir R. Griffith said that the strata of this locality had previously been considered by him and other geologists to belong to the new red sandstone and magnesian limestone group; but from a careful examination he had made of its fossils within the last year, he was now decidedly of opinion that they are coeval with the valley of Ballinascreen.

It appears that he has frequently changed his opinion regarding the Cultra rocks. In 1834, he thought they belonged to the mountain limestone, as above stated. Before the Cork meeting, say in 1842, he thought they were new red sandstone and magnesian limestone. In 1843, on reëxamination, he was “decidedly of opinion” that they are coeval with certain carboniferous beds in the valley of Ballinascreen, which are shown upon the Geological Map to be yellow sandstone.

The yellow magnesian limestone found here was discussed at the meeting of the British Association, in 1852, at Belfast, and many may remember that Sir R. Griffith and Mr. M'Coy maintained that the Cultra rocks belonged to the yellow sandstone, and contained new fossils, out of which Mr. M'Coy named the new genus *Dolabra*, with five species: while Professor King, a man of much experience in the Permian rocks of Durham and Yorkshire, and author of a paleontological treatise on Permian fossils, maintained that the fossils in the Belfast Museum, from the yellow limestone of Cultra, were Permian.



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To the statement made in Mr. Binney's letter, I will add that Mr. James M'Adam has many specimens of the *Modiola Macadamii* from Cultra in his collection, and he has told me that the specimens which Colonel Portlock named and dedicated to him were found there. He informed me also that he has spines of *Gyracanthus*; I saw with him several fine specimens of *Holoptychius Portlocki* from the same place. Adjoining the pier on the west side of Cultra Quay, I found many small lozenge-shaped scales of *Palæoniscus*, having a beautiful silvery enamel, and other specimens of the same form without enamel, which I took to be casts. Mr. M'Coy named thirteen new species of *Cypris* which I got at the same place. I will have occasion to use these fossils hereafter.

Ballinascreen district.—The second district is that of the valley of Ballinascreen in the county of Derry. This valley is peculiarly situated. It is bounded on the north by the White Mountain, composed of many rocks, chiefly old red sandstone, the top and east side being all covered with trap; on the south by Slievegallion, a mountain of granite, greenstone, and metamorphic rocks; on the west by the Sperrin Mountains, formed of mica slate; and on the east it opens to the low country towards Lough Neagh, which is all trap; the river Moyola flows eastward through it into Lough Neagh. Sir R. Griffith placed the black shales which occupy this valley in his yellow sandstone, as may be seen by the last edition of his map and by reference to the paper already referred to, which he read at the meeting of the British Association at Cork in 1843. I consider them to belong to the coal measures. Coal rocks, and coal itself, occur at Coal Island, Drumglass, and Annahone, west of Lough Neagh, and are believed to exist under all the chalk of that district, from Coal Island to Maghera. The country about Slievegallion Mountain and Ballinascreen has been much disturbed and dislocated. Near the top of Slievegallion is a patch of chalk, covered with trap, like that in the low country round Magherafelt; it rests on greenstone and metamorphic rocks, with granite in the vicinity. This patch is 1,500 feet above sea level, while in the low plateau between Magherafelt and Moneymore, the chalk is about 300 feet above the sea. It peeps from under the trap in many quarries hereabouts. This shows that the chalk on the summit of Slievegallion has been elevated more than 1,200 feet higher than its counterpart in the low flat country, and of course the whole mountain protruded to that amount, or the chalk let down in the low country.

Again, on the northern slope of Slievegallion there rests a patch of mountain limestone at a height of about 1,050 feet,

while the counterpart of the same rock at Desertmartin, in the low ground a mile and a half off, is only about 150 feet. These facts prove the dislocations just alluded to, and show that any attempt to work out the geology of this neighbourhood by the ordinary succession of the strata is impossible. This limestone on Slievegallion is accompanied by black shale, which covers the north slope of the mountain in the townlands of Cullion and Dromard, and continues across the valley of the Moyola to Fallagloon, near Maghera. The fossils found in this black shale are generally the same as at Cultra, as I shall try to show.

I got *Modiola Macadami* in the black shales of this valley, and put many specimens into Sir R. Griffith's collection. It is abundant in the townland of Fallagloon. In three places here I got *Holoptychius Portlocki*; that is, at Fallagloon, at Brackaghreilly, and at Moyheeland. Some scales found at the latter locality were the largest I ever saw, being two and a half inches in diameter. Very fine spines of *Gyracanthus* are also found here, in the bed of the Moyola River, about ten yards west of Moyheeland, two yards from the south bank, and from two to three feet deep in rather fine-grained black shale; they are easily got at in summer, when the stream in the middle of the river bed is small. It is from one of the specimens found here and sent to Professor Sedgwick, that Mr. M'Coy named the *Gyracanthus Obliquus*, figured in the *British Palæozoic Fossils*. Here were also found various fish bones and plants. *Spirifer bisulcatus* was got at Cullion, and *Limulus trilobitoides* in the Moyola River, in rocks about 150 yards east of the Forge Bridge, and two yards from the north bank; also *Cypris Scotoburdigalensis*. I shall again advert to these fossils presently.

Drumkeeran district.—Drumkeeran is the name of a parish in the county of Fermanagh, which includes a great part of the black shale district, between Drumquin and Pettigo. Sir R. Griffith has held two different opinions regarding this district. His first opinion is recorded in the Outline of the Geology of Ireland, which forms the first appendix to the Report of the Railway Commissioners, 1838. He says, p. 13:—"MILLSTONE GRIT.—Rocks decidedly belonging to this series are only to be met with in the mountain district surrounding Lough Allen, in the counties of Roscommon, Leitrim, Cavan, and Fermanagh, hitherto known by the name of the Connaught coal district, and in the shale district, extending from Drumquin, in the county of Tyrone, to Pettigo, in the county of Fermanagh". His second opinion is embodied in the following quotation, taken from the *Journal of the Geological Society of Dublin*, vii. 272. Referring to the same district between Drumquin and Pettigo,

he says:—"But Mr. Kelly's basis for the argument has no foundation, because the strata on the north shore of Lough Erne consist of yellow sandstone, and not of millstone grit". Comparing those two sentences, which have reference to the same rocks, it is quite clear that Sir R. Griffith in 1847 recants the opinion he held in 1838 regarding this district. To have done so was not only legitimate but right, provided the change was made in consequence of more accurate knowledge.

When it was noticed that millstone grit stands at a level 1,000 feet lower, to the north of Lough Erne, between Drumquin and Pettigo, than it does on Shean Hill, on the south, with sandstone and mountain limestone between them, all dipping the same way southwards—the great fault passing through the north end of Lough Erne⁶ being overlooked—a discrepancy arose, and, in order to get rid of it, the change of opinion since writing the "Outline" appears to have been adopted. If it could be shown that the district north of Kesh is yellow sandstone, as he asserts, there would be a sequence made out, with this rock and the limestone and millstone grit on Shean Hill, favourable to his views; but I hope to be able to show that the black shale district lying between Drumquin and Pettigo does not belong to his yellow sandstone.

To show this effectually, nothing more would be necessary than for any geologist who ever saw a good section of the old red sandstone to visit the locality, and to see the rocks with his own eyes; in this case there could be no mystification or misrepresentation; but since there is no hope that this can be done immediately, I must do the best I can to show it by other means, and first by a short description of the geology of the district.

Unlike the two districts already described, where no regular succession can be traced, there is here a succession of the carboniferous rocks, which, except on the south-east border, is remarkably regular and persistent. The country is divisible into four bands of rock, very distinct from each other. The northern band is old red sandstone, which has a southern dip; this is succeeded by calciferous slate; the third zone is mountain limestone; and the southern and largest area next to Lough Erne is millstone grit, or the base of the coal measures.

Of the old red sandstone near Drumquin, I have already given a sketch in a former paper, in describing the valley between Killeter and Mountjoy Forest.⁷ It has in the lower part on the north, between Drumquin and Killeter, the usual charac-

⁶ Geol. Soc. of Dublin, vii. 242.

⁷ Ibid, vii. 237.



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abundant. Be it remembered that beds of ironstone do not occur in this lower carboniferous sandstone, red or yellow.

This black shale is of a very different character from the calcareous black shale that sometimes appears in thin bands near the upper part of the old red sandstone, as it does at Porter's Gate, near Hook Point, and many other places; for besides its considerable superficial extent, being above forty square miles, and its great volume, being many hundred feet in thickness, it has but few fossils, and those belonging to the coal shales, as I shall show; while the shale at Porter's Gate occurs only in thin bands of alternating limestone and black shale, which contain an abundance of the fossils found in the limestone. Between Kesh and Pettigo the shale in its southern dip enters Lough Erne, and forms the rocky floor of that lough for some distance.

I have thus shown that in the district between Drumquin and Pettigo, we have the whole of the constituent rocks of the carboniferous formation; on the north the old red sandstone, succeeded on the south by the calciferous slate and mountain limestone, and these again by the black shale, all with regular dip and in regular succession. This shale, with its accompanying sandstones and ironstones, has all the lithological characters of a coal field, such as is seen about Lough Allen in Roscommon, Castlecomer in Kilkenny, at Killenaule in Tipperary, at Ennistymon in Clare, at Abbeyfeale in Limerick, or at Kanturk in Cork. It was rightly classified as millstone grit, with the Lough Allen district, in the *Outline of the Geology of Ireland*, already alluded to, before the fault at Lough Erne became apparent, or the desire for novelty and system-making grew strong among geologists.

The district of black shale just treated of is succeeded at Kesh on the south by limestone; but whether this is the outcrop of the limestone band unbroken, which dips to the south at Edenasop, passes under the shale and rises to the surface again on the south at Kesh, or whether it is thrown up by a fault along the southern boundary of the black shale, it is not easy to determine. The junction is obscure.

The fossils found in this black shale district are partially enumerated by Sir R. Griffith himself, in a paper he read before the Dublin Geological Society, 8th April, 1857, and which is printed in the *Journal of the Geological Society of Dublin*, vii. 267. They are *Modiola Macadami*, *Holoptychius Portlocki*, and *Sphenopteris linearis*. I believe there are, or there were, specimens of *Gyracanthus* spines in Sir R. Griffith's own collection, got by Mr. Ganly for him in the bank of the river Bannagh, in Drumkeeran. *Palæoniscus Egertoni* was found by

Colonel Portlock, at Drumkeeran, county Fermanagh (Ordnance Map, Sh. 5).

I shall now make a short recapitulation of the fossils of those three districts, and compare them with those found by Mr. Binney at Ardwick, near Manchester. He got there *Modiola Macadami*, several species of fish of the genera *Holoptychius* and *Palæoniscus*, and rays of *Gyracanthus*.

At Cultra have been found *Modiola Macadami*, *Holoptychius Portlocki*, *Palæoniscus* scales, and rays of *Gyracanthus*.

At Ballinascreen are *Modiola Macadami*, *Holoptychius Portlocki*, and rays of *Gyracanthus*. Also *Spirifer bisulcatus*, *Limulus trilobitoides*, and *Cypris Scotoburdigalensis*,

At Drumkeeran are *Modiola Macadami*, *Holoptychius Portlocki*, *Palæoniscus Egertoni*, and spines of *Gyracanthus*.

It thus appears that four of the fossils above enumerated are found at Ardwick, and in each of the three Irish localities, and that, so far as these fossils go, they show that the whole four districts are of the same formation.

Mr. Binney's authority as to the fossils found at Manchester, may be corroborated from another source. The best work we have as to the stratigraphical arrangement of fossils is *Morris's Catalogue*. In that work there are five species included in the genus *Gyracanthus*, of which four are recorded from the coal measures, and one, new, by Mr. M'Coy, from Moyheeland, a locality to which I have already alluded. In fact the *Gyracanthus* has not been found anywhere but in coal measures.

Of the genus *Palæoniscus*, there are thirteen species described in Morris. Of these seven are from the coal measures, and six from the Permian strata. We are not now dealing with the Permian, we care only for the coal shales; none of the species of *Palæoniscus* have been found lower down, and therefore are not known in yellow sandstone.

I have got some help in this matter from Sir R. Griffith himself. In the *Dublin Geological Journal*, vol. vi. p. 201, the following sentence is printed in a paper of his:—" *Sphenopteris linearis*, a well-known coal plant, is found in the lower shale of the yellow sandstone in the river Bannagh, near Kesh, in the county of Fermanagh". This plant is quoted in Morris's *Catalogue*, from the coal measures of four localities—Newcastle, Edinburgh, Swina, Bohemia, and from no other. The river Bannagh, and all the black shale district in Drumkeeran, is now disputed ground. There can be no doubt, therefore, from these as well as from numerous other localities, that this is a coal plant, and affords a proof, as good as any in the list, that the rocks about the river Bannagh are coal measures.

There is in the Museum of Irish Industry at Stephen's Green, a tablet of specimens of *Spirifer bisulcatus* from the coal shales of Coalbrookdale in England. Sir R. Griffith and myself got several specimens of this fossil in a ravine in the townland of Cullion, on the north-east side of Slievegallion Mountain. We picked them up in the bed of the stream, where the water, having melted away the black shale from about them, left them clean washed. This is another fossil which I add to the proofs that the Ballinascreen black shale belongs to the coal measures.

The *Limulus trilobitoides* is another fossil useful in this matter. Colonel Portlock got it near Maghera in Derry. He says, "The locality of the *Limulus* again appears, the rocks dipping to the east at Forgetown bridge".—*Rep.* p. 573. One of his collectors afterwards showed me the locality, in the rocky bed of the river Moyola, close to its north bank, about 150 yards east of the Forge Bridge, in the valley of Ballinascreen. Sir Roderick I. Murchison, in his *Siluria*, p. 281, says of this fossil: "It is among the superior coal strata, where *Trilobites* became extinct, that the *Limulus* appears for the first time, a genus of crustaceans which has lived on to the present day"; and again, p. 311, speaking of *Trilobites*, he says: "With the final extinction of a family destined never more to reappear, its place is taken by an allied crustacean—the *Limulus*—the earliest form of which was created during the formation of the great coal fields". Buckland says, in his *Bridgewater Treatise*, p. 393: "The *Limulus* has been found fossil in the coal formation of Staffordshire and Derbyshire". There are three species of it known, and it has never been found anywhere below the coal shales; the Moyola River, where Colonel Portlock found it, must consequently belong to this group.

The little *Cypris Scotoburdigalensis* is recorded by Colonel Portlock as having been found in those Ballinascreen shales. It is quoted by Morris from the coal measures of Burdie House, near Edinburgh. This too has been found only in coal shales. The genus *Cypris* occurs in specimens innumerable in the black shales both of Ballinascreen and Cultra.

All this evidence makes a chain to connect these three localities with one another. Besides the fossil, there is the strongest lithological evidence that can be laid before the eye in the colour and constitution of those gray and black shales, that the rocks of which the three localities are composed, having the same stony character and the same community of fossils, are all of the same formation:

I stated last year in my paper on the calp, that the black shale in the vicinity of Bundoran is calciferous slate, not calp; and a



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To the eastward of Lough Erne there appear to be an unusual number of faults,⁸ and some of them of great magnitude. Dooish Mountain, south-west of Drumquin, is mica slate. It is very micaceous, and of the very oldest type of that rock. It stands 1,119 feet above the sea level, and about 500 feet over the average surface of the country. On the north it is in contact with millstone grit, on the south with the brownstone which conformably overlies the Pomeroy and Lisbellaw fossiliferous Silurian rocks. The junction with the millstone grit along the northern base of Dooish appears to be a fault, and the mountain itself appears to have been pushed up in a solid state through all the overlying sedimentary rocks; that is, through the Cambrian, the Silurian, and the carboniferous formations. The beds of limestone to the north of the mountain are thrown up on their edges, and then contorted in a very remarkable manner. This proves an unusual amount of lateral pressure, such as would occur on the protrusion of a mountain mass through the overlying formations, and spreading out the adjacent strata from its sides laterally, like a wedge driven from below with its point upwards.

What may be the perpendicular amount of this fault through those three formations? I shall try to make an approximation to it. This very old mica slate, in the north-west of Ireland, is accompanied and interstratified with quartz rock and gray granular limestone. Of this group the quartz rock is lowest, as it lies immediately on the granite at Malin, at Dunaff, and Fanit, on the north-west coast of Donegal. This group in Innishowen, near Culdaff, has many undulations, but at three or four miles south of Culdaff, the rocks begin to have a steady dip to the south-east; this continues for about five miles, and the group is surmounted by an enormous thickness of gray slates and grits, which accumulate towards Moville. These slates are

⁸ In speaking of the country between Drumquin and Pettigo, Sir R. Griffith says: "If Mr. Kelly has not himself examined this district with a view of ascertaining whether his fabric of faults was well founded, and if in default of his own observations, he depended on published data supplied by me, he should have referred to the latest edition of my Geological Map" (Jour. Geol. Soc. of Dub. vii. 272).

The only observation I have to make upon the sentence is, to express my astonishment that it could have been written by a man of science. This attempt to ignore the services which I rendered towards the completion of the Geological Map of Ireland is certainly very little in harmony with the spirit of justice which ought to characterize true disciples of science. Geologists may judge of the value of the passage just quoted, when I tell them that it was I who marked out the geological boundaries of the district between Drumquin and Pettigo, and that it was from my notes and maps that those boundaries were transferred to the present Geological Map.

in general glossy, but cannot be called mica slate. From the absence of fossils, and their great thickness, these slates and grits appear to be the equivalent of the Cambrian group of Wales. From the data here given, with an average dip of 45° , this group must be above 18,000 feet in thickness.

On the south side of Dooish, the brownstone of the Silurian rocks comes in direct contact with the mica slate of the mountain. Those Silurian rocks are, of course, below, on the north side, under the millstone grit, as well as on the south (for the mountain is scarcely two miles wide at its base), and would there overlie the Cambrian. The Silurian rocks have been estimated in England at 20,000 feet in thickness. They may be as much here. The carboniferous rocks in the north of Ireland, where the coal shales or the limestones are not thick, may be taken at about 2,500 feet, making the whole of the three formations together at the least 40,000 feet; and this I assume to be the perpendicular amount of the fault on the north side of Dooish Mountain.

On the south side of this ridge there is also a fault, and in proof of this may be adduced the fact, that a greenstone dike is visible in some places in the boundary between the mica slate and the brown Silurian grit. The amount of this fault is equal to the thickness of the Cambrian and Silurian rocks added together; there being no carboniferous formation here over the brownstone, it may be taken, as just calculated, at 38,000 feet.

The enormous extent of the faults here assumed is only necessary in connection with Dooish Mountain; the amount is unknown east and west of that point, but the rocks brought into juxtaposition at the surface have not come up from such great depths, nor do they exhibit above such a difference of age as would require faults as great as those just mentioned.

It may be argued against these views, that Dooish Mountain might have been a steep ridge in the sea under water, or a steep-sided island over it, when the rocks were deposited. If this had been the case, the deposited beds would have sloped away gradually from the steep sides both north and south. As proofs that this was not the case, may be mentioned, the violent contortions in the limestone band produced by lateral pressure near its northern base, as may be seen on the map; the greenstone dike at intervals in the junction on the south side; and a third fact, that brown Silurian grit occurs on the south, and millstone grit on the north side of the mountain, at the same average level of the surface of the country—about 400 to 500 feet above the sea. This fact of Silurian rocks and millstone grit being on the same level, is as strong a proof as either of the others, that disruption

took place between the north and south sides of Dooish Mountain. That those rocks were deposited in this position, no geologist will maintain. The protrusion of the mountain in a solid state, and the accompanying faults, are therefore the inevitable consequences which must be inferred.

The fault I have described in my paper, running into the Atlantic at Bundoran, goes along the northern boundary of the old red sandstone, and enters Lough Erne at the high precipice of Shean Hill, which I take to be the south side of this fault. This is where the millstone grit is thrown down 1,500 feet, from Shean Hill on the south, to Portinode on the north of Lough Erne.⁹ This course of the fault from Bundoran produced across the Lough, is seen to easily fall into the fault just alluded to, which lies between the mica slate and brownstone to the north of Lisnarrick; followed eastward, along the northern boundary of the brownstone or brown Silurian grit, it separates this rock from old red sandstone and mountain limestone near Omagh. Three or four miles east of that town, the brownstone again joins mica slate, takes a flexuous course southward, and then eastward, where it comes in contact with two elongated protrusions of granite, one after the other, accompanied by greenstone, porphyry, and metamorphic rocks. This continues to near Pomeroy. Along this line, a great dislocation occurs, and possibly continues into Lough Neagh. From Bundoran to Lough Neagh, along this line, is seventy-two miles.

Having said so much on faults, or dislocations of great magnitude, I shall now advert to some on a smaller scale, at least in extent. To the east of Lough Erne, along the northern boundary of the Silurian grit near Lisnarrick, in Fermanagh, this rock is in contact with mica slate, millstone grit, mountain limestone, and old red sandstone, for a distance of four or five miles. In this district a small triangle of a few square miles, between the little towns of Kesh, Lack, and Lisnarrick, comprises mica slate, millstone grit, mountain limestone, old red sandstone, and Silurian grits, not in succession, but in juxtaposition at the surface.

Such is an outline of what Sir R. Griffith calls my fabric of faults near Lower Lough Erne; and it appears to me that the juxtaposition at the surface in the Kesh triangle, of the older rocks, which were deposited at such different depths of the Earth's crust, cannot be explained in any other way. At least, I would like to see an explanation of the geological phenomena of this district, without the intervention of faults. I may add, that in such

⁹ Jour. Geol. Soc. Dub. vii. 232.



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Earth's crust, and separated by faults. Except in two or three instances, none of those now in contact occur in the usual succession.

I think I may say that my fabric of faults near Lough Erne is fully represented near Dublin.

Last year Mr. Joseph O'Kelly, of the Geological Survey, discovered a fault on the north side of Slievenamuck Mountain, near Tipperary, by which the coal measures are thrown down. He described it in the *Natural History Review*.¹¹ He estimates the amount of this fault at 5,000 feet. The coal measures of that locality were not known before he discovered them.

MIDDLE DISTRICT.—The typical yellow sandstone, which first suggested the idea of this subdivision, is chiefly to be found in this district. It comprises all the counties in the middle zone of Ireland, from the east coast to the west. The descriptions of it in various localities are set forth in several paragraphs of the Outline of the Geology of Ireland already adverted to. I will not quote those detailed descriptions, but briefly say that the old red sandstone is described, at pages 8, 9, in one of them; in a second, the yellow sandstone; a third gives its thickness, ranging from 600 feet to 1,000 feet; and a fourth says, "The yellow sandstone succeeds the old red, and where that is wanting, it rests on primary or transition rocks".

I may as well state at once that I consider the whole of those descriptions as appertaining to different parts of the old red sandstone. Taking this rock as a whole, the upper part of it is yellow, the lower part is red; and, so far as I can see, there is no good reason for making a separate subdivision of the yellow part at all, because it has no definite base. In the north of Ireland the prevailing colour is red, in the south it is yellow; but there is no fixed point of demarcation, or plane of division, between the red and the yellow colours. In Sligo and Mayo, the yellow part at top is from 50 to 100 feet thick. Round the Slievebloom Mountains, in the King's and Queen's counties, it is from 200 to 500 feet, while round the Derrybrian Mountains, in Galway and Clare, the yellow colour prevails altogether, and the thickness of red beds near the base is only about fifty feet. In short, in some places the yellow part is no more than one-eighth of the thickness of the old red sandstone. This is the case at Scrabo, near Newtownards in the county of Down. In some localities it is as much as half, and in others it is fully five-sixths of the whole mass. At Tober Elathan, six miles south-west of Loughrea, in Galway, in the conglomerate of the very lowest bed,

¹¹ Nat. His. Rev., iv. 251.

which is there well exposed, the yellow colour prevails. It appears, therefore, that changing the name of a part of this group from old red sandstone to yellow sandstone, is wholly uncalled for and unnecessary, and tends to injure the nomenclature and classification of the carboniferous system.

Cases sometimes occur in which the upper beds of the old red sandstone are interstratified with gray bands, consisting of black shale, alternating with dark gray limestone in thin beds. One of the clearest of those cases that I know of is in a very fine coast section at Porter's Gate, near Hook Head in Wexford. In that locality there is a band of black shale interstratified with thin layers of encrinital limestone, containing abundance of fossils, most of them being of the kinds found in the limestone above. There is yellow sandstone above this gray band, and yellow sandstone below it. This appears to be one of the chief reasons for adopting the yellow sandstone as a subdivision of the carboniferous formation. It appears to have been considered that those fossils, being found imbedded in it, gave it a claim to distinction, and entitled it to get a special name in geology. But fossils belonging to the mountain limestone are got in red sandstone near the bottom, and in the middle of the old red sandstone in the river at Kildress, near Cookstown, in Tyrone. This fact of fossils being found in the red part near the bottom, as well as in the yellow part near the top, nullifies the claim of the yellow for fossil distinction. The yellow sandstone at Porter's Gate, as in all other places, has no definite base, for in the fine section which this place exhibits, the passage from the yellow above into the red below, affords no indication by which any decided bed can be fixed upon as the base of the yellow part, because, as well as I can remember, there are intercalations of red and yellow coloured beds in the passage.

Since there are, however, shale bands in the upper part of the sandstone, it may be asked where should the line be drawn to determine the upper boundary of the old red sandstone? I would say it ought to be at the top of the upper bed of sandstone, because the succeeding rock, calciferous slate, is a neutral band, and not at all allied to the sandstone under it. The slate itself is very properly made a subdivision. Any thin bands of shale below the upper bed of sandstone might be included in the latter rock, and the whole be again properly called old red sandstone.

A few years ago, Slievedart in Galway, and Slievemurria in Roscommon, two remarkable hills, were coloured on the Geological Map as yellow sandstone. This has very properly been altered in the last edition; but still there remain twenty or thirty small patches of yellow sandstone, which it is to

be hoped will, in the next edition, be made of the same colour, for they really are all of one colour in the hills.

It will be observed by looking on the map, that round the Derrybrian Mountains in Galway and Clare, there is a very narrow border on the outside of the sandstone district, adjoining the calciferous slate. What does this border represent? It is in the position of, and made apparently to represent, yellow sandstone. Nearly all the old red sandstone at Woodford and Mountshannon, Tulla and Gort, is yellow, and in many places from a mile to three miles wide. There is no good reason for marking off those narrow bands on the map, where no difference can be observed in nature. This appears to have been done to make the yellow sandstone of this district consistent with the long narrow bands, shown as yellow sandstone in Cork, of which I shall speak presently. The same observation applies to the narrow bands round the Slievebloom Mountains; round the Knockmeldown Mountains, the Galtees and Cappawhite in Tipperary, at Abington in Limerick, and Thomastown in Kilkenny.

§ 3.

SOUTHERN DISTRICT.—There appear to be several errors of considerable magnitude in the representation of the county of Cork, some of which run into the south-eastern part of Waterford.

1. The brown colour, representing old red sandstone, extending from the Blackwater to the Lee, and in an east and west direction from the Boggra Mountains to the eastern coast between Youghal and Helvick Head. To this large district may be added other minor ones, as, first, one extending from Carrickfadda by Mount Gabriel to Mizen Head; a second, from Clonakilty to Cape Clear; a third, from Dunmanway, south of the Lee, to Cable Island at Youghal Harbour; a fourth, from Ballymarth, across the entrance of Cork Harbour, to Ballycotton. These are all composed of grits and slates, such as those seen in the peninsula of Dingle in Kerry, and which, as I shall show, are now proved to be undoubted Silurian rocks. The area of those altogether makes about 1,160 square miles.

2. Some beds of whitish friable grit containing plant remains, and other similar beds containing casts of bivalve shells belonging to the Silurian rocks, are shown and coloured as very long narrow bands of yellow sandstone.

3. The portion in the southern part of Cork, coloured green, to represent calciferous slate, is all composed of grits and slates, mostly of a gray colour. They extend from Cork Harbour to the west coast. They all belong to the old grauwacké series or



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tains; by Glengariff, south of Kenmare, Macroom, Millstreet, Musherra Mountain, and the Boggra Mountains, to the cutting in the Cork and Mallow railway. In all those places the Silurian grits and slates are as well defined in lithological character, in colour and alternations, as they are about Dingle.

I have stated that in the south-east of Cork and Waterford the rocks, as shown on the Geological Map, appear to me to have been mistaken. To prove this, it will be necessary to give a short physical and geological account of that part of the country.

The Boggra Mountains attain an elevation of twelve hundred to thirteen hundred feet above the level of the sea, but proceeding eastward from this group, the average surface elevation declines gradually. At Watergrass Hill, a meridional section is much lower, say about five hundred feet, and the surface continues declining until it reaches the shore near Youghal, where it disappears under the Irish Sea, the coast line cutting across the general strike of the rocks, and exhibiting their relations.

The whole country consists of a series of undulations, composed of anticlinal ridges and synclinal valleys, which assume almost everywhere an east and west direction. The rocks, except in some valleys, are gray, green, or brown grits, interstratified with gray, green, purple or red slates. In some parts of the district the green and brown grits are pretty equally distributed, as in the Fermoy River, east of the Boggra group of hills, and in the railway section of the cutting from Mallow to Cork. In other districts one colour prevails, as has been already noticed in the case of the green grits at Connor Hill, and the brown grits at Sybil Head, near Dingle. There is a great thickness of red slate in Mount Hilary, south of Kanturk. The brown colour prevails eastward towards the shore in most, if not all, of the anticlinal ridges between Cork and Helvick Head, near Dungarvan. Those grits and slates have the same stony character as the rocks in the Dingle peninsula, and all are, as I believe, Silurian rocks.

The lithological character of the calciferous slate and mountain limestone rocks of this district, differs from that which they usually present in the rest of Ireland. They are much affected by cleavage, and their fossils are distorted. I do not mean to give a particular description of every valley, but it is necessary to state the facts connected with one or two of them. In reasoning on those facts, and in offering evidence concerning any one trough or valley, I shall use that which is positive, where a fact is clear and the rock undoubted; but the negative must necessarily be used where a rock does not appear to be present in

the position it ought to occupy in the sequence. On this part of the subject I must be particular, as I have to deal with preconceived notions. It requires a good deal of hammering to knock an old idea out of the head of a geologist, and to put a new one in its place.

The synclinal valleys or troughs in the south-east parts of Waterford and Cork, where the elevation does not exceed about 100 feet, are usually filled with rocks of the carboniferous formation. Mountain limestone, with calciferous slate, are the most common, but sometimes there is a little old red sandstone, and sometimes a little of the coal measures, as I shall endeavour to show. The bottom of the synclinal hollow often has no carboniferous rocks, but the usual green and gray, brown and red, Silurian grits and slates of the country.

Those synclinal valleys or troughs containing carboniferous rocks, the beds of which are nearly all parallel to each other, are supposed by some geologists to lie conformably on the inferior strata of brown grit or other rock, but this appears to be highly improbable. I believe that here, as everywhere else in Ireland, the carboniferous system lies unconformably upon the inferior rocks. Out of seventy-eight cases, affording good junctions, that I examined closely, and recorded in the *Journal of the Dublin Geological Society*, vol. vii. p. 119, I did not see a single case where they were conformable. I therefore consider that the limestone of the troughs of Waterford or Cork does not lie conformably on the brown or gray beds (Silurian grits) of the country that lie beneath it.

The old red sandstone in Cork; is shown, as before stated, on the Geological Map to the extent of about 1,160 square miles to the south of the valley of the Blackwater. It is my purpose to show that all this old red sandstone is Silurian, like the Dingle grits, and should be so coloured.

I have already traced the Dingle grits, step by step, from the Dingle peninsula to the railway cutting between Mallow and Cork,—that is, into the heart of this supposed old red sandstone. At Commons, one mile north of Cork, similar grits, brown and green, are seen in small quarries, as characteristic as any in the Dingle peninsula. Thus, those rocks are traced to within a mile of Cork.

The old red sandstone has two prominent points of character, which, in all parts of Ireland, stand out in relief, and make it a rock which cannot be mistaken for any other. The first is a thick band of conglomerate at its base, which generally contains quartz, jasper, and other pebbles; the second, that this conglomerate always lies unconformably on the inferior rock. Other

characteristics are, that the lower part of it is usually of a red colour; it passes upwards into yellow, but both are comparatively soft, and easily split for economic use into rudely rectangular blocks, according to the will of the workman,—a circumstance quite at variance with, and distinguishing it from, the Silurian grits, which are so much affected by cleavage, and so hard, that blocks of them are quite refractory under the wedge, the hammer, or the chisel, and cannot be worked satisfactorily for building purposes.

The conglomerate band, as it appears near Hook Point in Wexford, at the Devil's Bit in Tipperary, and at Bartrigoum, on Slievemish in Kerry, does not exist in the county of Cork in positions where it might be expected,—that is, in the vicinity of the mountain limestone troughs. It appears, therefore, that the conglomerate diminishes in thickness from Tipperary and Kerry southward, and is wholly absent to the south of the valley of the Blackwater in Cork. The old red sandstone of the true typical kind, like that near Hook Point and the rest of Ireland, seems to be wanting here. It either thins out to nothing, or it is buried in faults at the edges of the limestone troughs. It is most probably absent, for if it existed it would be found at the sides or ends of some of the smaller boat-shaped synclinal troughs of limestone or of calciferous slate, which exist in many parts of the district.

It is true that immediately about the railway tunnel at Cork, as well as all the way to Helvick Head in Waterford, the brown-coloured rock prevails, as it does at Sybil Head, near Dingle; but the well-known band of conglomerate is absent; the unconformable sequence is absent; there is no trace of either of those characters in or about the tunnel, or any where in the railway cutting near Cork. The geologist may look in vain there for them.

It will be seen that, in the valley of the Lee at Cork, the brown grit dips southwards under the mountain limestone, and it does so at the very steep angle of 60° ; but there is every reason to believe that there is a broken sequence between the two. There is no calciferous slate visible at Cork between the brown grit and the limestone, although it has been stated by a geologist that there exists at Monkstown, in the vicinity, 2,600 feet in thickness of it. Limestone is visible at the Bandon railway station in Cork; it is said to have been quarried on premises in Brown Street. Either of those localities is but a short way from the brown rock on the north bank of the Lee. Even if the calciferous slate were visible, and stood on edge, there is not room for 2,600 feet thick of it; nor is there one-fourth, I might



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Mallow. It is also at Quartertown, one mile south of Mallow, where it lies unconformably on the Silurian grits. The junction is at the north end of the first railway cutting, going from Mallow southward. It was laid bare when the formation of the railway was in progress, and then clearly exhibited the unconformability, which I had the good fortune to see. The Silurian grits in the cutting have slight undulations and a general dip eastward. The old red sandstone dips steadily from the junction to the north-east 15° , and appears to dive under the limestone of the valley about Mallow. There is no conglomerate visible at its base here. This rock also occurs at Ballyvoil Head in Waterford, where it is of a yellowish colour. The beds are visible on the strand between high and low water. I will return to this locality presently. I know of no genuine old red sandstone to the south of those three places in Waterford or Cork.

Yellow Sandstone.—There is in *The Journal of the Geological Society of Dublin*, a paper, by Sir R. Griffith, from which the following extract is taken, vol. vi. p. 201:—

“The position in which the copper beds of the county of Cork occur is generally very near to the outgoing of the *yellow sandstone* as laid down on my Geological Map; hence, in a practical point of view, it becomes most important that the miner should be made acquainted with the indications which characterize the commencement of that group, as without this clue no direct benefit could be derived from the discovery of the position in which the metallic beds usually occur; but, possessed of this knowledge, walking along the strike of the strata near the outgoing of the yellow sandstone, the miner will examine with confidence all the surface indications, and when he observes the bright green tint which the cupriferous beds generally present, he will at once conclude he is on the proper trail”.

Page 203. “Metallic beds, producing copper and lead, have been discovered, and many of them partially worked, near the line of the outgoing of the yellow sandstone, for a length of sixty miles, or from Ringabella, near the entrance to Cork Harbour, to the Mizen Head”.

The foregoing description certainly promises a ready method of finding the mineral treasures of South Cork. What will be thought of a person who has the hardihood to say, that there is no yellow sandstone of the ordinary type to be found in the locality to which the above description applies, and that, even if there was, yellow sandstone is one of the most barren of rocks in *mineral* wealth? This is what I venture to say, and here are my arguments.

If a line be drawn from Cork Harbour across the county to Bantry Bay, through the towns of Monkstown, Ballinhassig, In-

niskeen, Dunmanway, and Glengariff, the high lands of the county lie to the north of this line, and to the south of it the country is comparatively low. This low country is about 72 miles long from Cork Harbour westward to the Atlantic, and 12 miles wide, making about 860 square miles. In the last edition of the Geological Map (1856), several very narrow yellow bands are seen running east and west, in the strike of the strata through the low country just pointed out: these thin bands represent the yellow sandstone, and measure on the map about 435 miles altogether in length in Cork, besides some in Waterford. They consist of a single bed, sometimes of two, and from two to four feet thick. I believe that those narrow stripes, where they occur at all, are not yellow sandstone, according to the usual meaning of that term, and that in three hundred miles in length of them, as shown upon the map, there is no difference of appearance in the rocks to warrant the laying down of any such bands at all. I shall detail a case to show this more fully.

In the section of country between Dunmanway and Roscarberry which crosses the strike of the rocks of the country, there are four of those thin narrow bands shown on the Geological Map of Ireland. In 1852 I had an opportunity of examining this line of country, and looked for those bands with anxiety and interest, and can vouch for the fact, that there is no visible sign whatever of yellow sandstone at Dunmanway, where one of them is shown. I examined every one of the rocky knolls on the slope of the hill north of the town, followed them in the direction of the band, as laid down on the map, for a mile to the east and a mile to the west of the town, but could only find gray and green slates and grits of more ancient rocks.

I also examined, and with a like result, the rocks of Carrickfadda, about half-way between Dunmanway and Roscarberry, a short way to the north and south of which two more of those yellow bands are shown. I could not find any yellow sandstone—nothing but gray grits and gray slates of the old grauwacké rocks. I examined, for some miles of its length, the position of the southern one of the four bands near Roscarberry, but no trace of yellow sandstone was visible. There is therefore no ground for separating those four yellow bands, shown on the map, running east and west between Dunmanway and Roscarberry, from the other rocks of the locality.

A whitish friable bed of rock, containing obscure remains of plants, is found in many places in the Silurian grits and slates of South Cork; and this bed, in one or more of its convolutions, is either repeated in other places, or there may be other similar

beds in the country, containing casts of certain bivalve shells,—both plants and shells being obscure, and many of them new forms. These plant or shell beds cannot be followed through the country for anything like the continuous length laid down on the map.

It is this plant-bed that has been taken in the south of Cork for yellow sandstone; but it cannot be that rock, because wherever it has been discovered, it forms but a single bed, from half a yard to a yard in thickness. It is bounded on both sides by the adjacent brown or green grits and slates of the Silurian rocks, and dips at the same angle with them, being, in short, nothing more than one of the beds of that series; whereas the yellow part of the old red sandstone has numerous beds, and is of considerable thickness, and instead of dipping with the brown or gray grits, if there at all, would lie unconformably over them. This fossiliferous bed in the Silurian rocks reminds one of the bone bed in the lias: the lias bed, however, contains fragments of bones and remains of fishes—while the Silurian bed contains fragments of plants or casts of certain bivalve shells, obscure, or not known. It is absurd to suppose that yellow sandstone, which is many hundred feet thick on Slievemish in Kerry, and in the Galtees in Tipperary, could be represented in Cork by a single bed. I hold, then, that this bed cannot be called yellow sandstone. It is visible in one locality near Cork, that is, immediately north of the city, in an old quarry on the north side of the Glanmire road, and there affords obscure fragments of plants.

Sir Henry De La Beche has given this matter some consideration, as may be seen in his *Geological Report on Cornwall, Devon, and West Somerset*. He says in that work, at p. 132:

“That it should have been considered an anomaly, as has been done in England, to discover plants in an earlier rock analogous to those so abundantly found in the coal measures, is the more remarkable when we reflect, that it has for some time been held by continental geologists that plants similar to those in the coal measures are discovered in *grauwacké*. And it should be recollected that this opinion has been held, not by geologists who, as formerly, made no distinction between coal measures and *grauwacké*, but by those who did make, and well understood, such distinctions”.

M. Burat said, in 1834, when speaking of the *grauwacké* series:—

“Fossil vegetables are not abundant in it; nevertheless, the upper part of the system sometimes contains them in great quantity. They consist of ferns and reeds analogous to those found in the coal measures”.



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Brongniart to have their names determined. The nine localities were—

1. MacSwyne's Bay, west of Dunkineely, county of Donegal.
2. Fallagloon and Dromard, in the valley of Ballinascreen, in the county of Londonderry.
3. Bunatrahir Bay, and other places, near Ballycastle, county of Mayo.
4. Monaduff, near Drumlish, county of Longford.
5. Hook Head, near Fethard, county of Wexford.
6. Tallow Bridge, county of Waterford.
7. Glanmire, near Cork.
8. Coomhola, near Bantry, county of Cork.
9. Kiltorcan, south of Thomastown, county of Kilkenny.

It is to be regretted that the locality of every specimen, as numbered, is not given in this paper, as this, coupled with M. Brongniart's notes, would increase the interest in this part of it considerably. The author says, at page 315, "The plants are not confined to the yellow sandstone beds, but in some localities, as I understand from Mr. Jukes (as at Ballyvoil Head and in the county of Cork), extend into the red grits, and even cornstones and shales which lie below them, and which, on account of colour, I have classed with the old red system, and have tinted them as such on my Geological Map". The specimens sent to M. Brongniart, were not, it seems, confined to the yellow sandstone. Some of them were got from the red grits, cornstones, and lower shales. These would have made one or two more localities if they had been named, and very interesting ones. Those red grits and cornstones, from recent investigations made of parts of Cork, Kerry, Hertfordshire, and Brecon, appear now to belong to the Silurian. The black shales of Ballinascreen are coal measures, as I trust I have shown. At Tallow Bridge the rock I believe not to be carboniferous, as it dips with the brown grit behind it. Coomhola grits, I believe, when their fossils come to be investigated, will prove to be Silurian. M. Brongniart's observations show that the contents of the box proved a complete puzzle to that great man. And no wonder. A box full of a mixture of fragments of plants, sent from the Silurian grits and cornstones, the yellow sandstone, and the coal measures, was no easy subject to investigate in a satisfactory manner.

The following are a few of M. Brongniart's notes on the specimens sent to him:

"No. 3, 15, 19, are very remarkable specimens, and altogether new to me.

"No. 19.—I know no similar stem in the fossil state, and I cannot place it with certainty in any known family.

“Are these stems single or dichotomous? What are the organs inserted at the scars? Are they linear leaves like those of the *Lepidodendron*? and are linear leaves, contained in the same specimen, portions of the same plant? Are the roots like the *Stigmaria*? I do not think so, but there is much uncertainty on the subject.

“No. 16 is altogether unknown to me, and its nature is very difficult to appreciate. Can it possibly be a compressed rhizome of a fern?

“Ill defined fragments. The label says ferns, but I see no traces of any.

“I merely remark that the fig. 2, marked *Sigillaria dichotoma*, differs much from the specimens from Tallow Bridge, sent under the same name”.

It will be seen that I do not admit, as belonging to the old red sandstone,—that is, to either the red or the yellow part,—the whitish friable plant bed on the roadside near the railway tunnel at Cork; or a similar bed at Tallow Bridge in Waterford; or a third bed of the same kind at Knockahavaun, two miles north of Dungarvan; with many others too numerous to bring forward here. These plant beds all dip at the same angle, and lie parallel to the brown Silurian beds with which they are associated, and cannot be separated from them in any way as part of a different formation. If the brown grit be Silurian, the plant beds are Silurian.

The Cappagh mine is thus spoken of at page 202 of Sir R. Griffith's paper: “The lode in this mine consists of a true metallic bed, composed chiefly of gray slate interstratified with gray quartzite, forming a portion of the yellow sandstone of that locality. The thickness between the north and south walls varies from two feet to two feet six inches, and the enclosing walls consist of schistose quartz, or quartzite, the rib containing the ore being generally close to the north wall”. Again, page 203: “The yellow sandstone rests upon the upper beds of the Devonian, and underlie the carboniferous slate”.¹³

Regarding these quotations, I have to say that the metallic bed, consisting of gray slate interstratified with gray quartzite, and the enclosing walls, consisting of schistose quartz, or quartzite, cannot be yellow sandstone. We have abundant and familiar examples of gray slate, gray quartzite, and schistose quartz, in the rocks along the shore at Bray Head, and the descriptions above quoted are equally true of the rocks at Cork and of Bray Head. The grauwacké rocks, in a thousand localities in Ireland, might be equally well described by the same phrases. No careful geologist would call such rocks yellow sandstone.

As to the yellow sandstone resting on the upper beds of the

¹³ Jour. Geo. Soc. Dub., lvi. 207.

Devonian and underlying the carboniferous slate, if there be no yellow sandstone in that country, there is no Devonian, and there is no carboniferous slate. The rocks called Devonian, between Dunmanway and Roscarberry, are composed of the usual gray, green, and brown grits, and gray and red slates, of the grauwacké of the south of Ireland. The supposed yellow sandstone bands shown on the map, are composed of the same, and the so-called carboniferous slate likewise. All the rocks of that line of country are, as I have said before, of more ancient date than any part of the carboniferous system.

The following remark occurs at p. 201 of the same paper:

“The position of the copper beds of the county of Cork is generally very near to the yellow sandstone as laid down on the Geological Map.”

It is not said whether this proximity of the mines to the yellow sandstone be owing to any electric or other influence possessed by this yellow sandstone to attract metallic particles towards it, or whether it be owing merely to accident. The observation is at all events a very vague one. There are eighty-four marks on the map in that part of Cork, to indicate where mines are said to exist, or trials for mines made: of these, only three are apparent on any of the yellow bands; thirteen are within a furlong of some one of them, and sixty-eight are more than a furlong, or beyond any possible metalliferous influence which could be derived from the proximity of the supposed yellow sandstone. Further, there is no mark of a mine within a mile of either of the four northern bands, which together measure 300 miles, out of 430, which is about the length of the eight or nine in the county. How, then, can it be said, as at p. 201, “that it becomes most important that the miner should be made acquainted with the indications which characterize the commencement of the group of yellow sandstone beds”? In reality there is no useful indication pointed out in this whole paper but the bright green tint mentioned at p. 201, and when the miner has this, which is a strong indication of copper, before his eyes, he need not care if the outcrop of the yellow sandstone, as shown upon the Geological Map, be forty miles away.

Calciferous Slate.—The calciferous slate is one that is easily recognizable by any one who has noticed it well. It lies on the top of the old red sandstone and beneath the mountain limestone. It is a soft rock, often brown at the surface where decomposition has set in, and dark gray downwards where it is unaltered. It is generally full of fossils, chiefly of the genera *Fenestella*, *Orthis*, *Spirifera*, *Producta*, and crinoid stems and



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There are many synclinal hollows, or troughs, of calciferous slate like this one between Blarney and Macroom in the south of Cork. They are often small, not exceeding a mile or two in length. There are some of this kind especially about Cork harbour, assuming mostly the form of narrow elongated troughs, sometimes containing limestone, sometimes not.

There is a characteristic trough of this kind at Killanully, to the west of Carrigaline. The limestone in it is about one mile and a quarter long in an east and west direction, and a quarter of a mile wide. Calciferous slate of the Clonea type is seen to the south of the mass, along the Owenboy river, dipping to the north under it, but none on the north side, at least none visible. This limestone does not appear, from its dip, to be like the synclinal trough at Dungarvan, even on a small scale, but rather more like the Taghmon block, to which I shall allude presently, or it is kept up at the south side, and dropped down by a fault at the north one, into the place it occupies.

I now come to speak of those slates in the south of the county of Cork, coloured green on the Geological Map to represent calciferous slate. The northern boundary of this green colour is shown passing through Dunmanway; and there it became important to look for a good section, so as to ascertain the reason of the distinction. I examined two or three sections near that town to determine whether the brown rocks to the north of the town, or the gray rocks to the south of it, lie uppermost. This could not be done by a meridional section through the town, because though the rocks for a mile to the north are well exposed, there is a synclinal valley through the town itself, and for two miles south of it the country is cultivated or in grass. Any bits of rock at all visible are few and far asunder.

There is a good section on the west side of the Bandon river, four miles east of Dunmanway. In the north part of the townland of Toom, the brown grit and purple slate are the chief rocks that meet the eye. Proceeding southward down the gentle mountain slope, beds of gray slate begin to appear alternating with the purple, and soon get common, so that at the southern boundary of the townland the bands of gray and purple slates are pretty equal. Next comes Balteenbrack, and in the southern part of this townland nearly all the rocks are gray, and the red and purple disappear. Those gray rocks continue southward for miles.

In going over the section towards the south, as first described, from the brown rocks to the gray, there is no synclinal hollow—no apparent fault—nothing but a simple southern dip all the way from the brown rocks on the north to the gray rocks on the south, which shows that the gray rocks are uppermost.

Those gray rocks are what the author of the Geological Map calls carboniferous slate, but they cannot be that rock. There are certain conditions wanting at the base of it which ought to be present. The grits and slates of every colour to the north of the junction near Dunmanway belong to the Silurian grits, like those at Dingle; and supposing, for the sake of argument, the gray rocks to be carboniferous slate, there ought, according to the usual sequence in Ireland, to be old red sandstone between the two, together with an unconformity in the succession at its base. Now, though the rocks are well exposed here in a section of two miles long, dipping from 50° to 70° south, and above 9,000 feet in thickness, such a thing as a band of conglomerate 40 or 50 feet thick, succeeded by 1,000 feet thick of soft red sandstone and red shale lying unconformably on Silurian grits, is not to be seen before we come up to the gray slate, coloured as carboniferous.

I have thus shown that, supposing the gray rocks to be carboniferous slate, the conditions of the succession at the base of it here are not what they usually are, and therefore, that the gray rocks are not carboniferous slate, as supposed. The brown beds on the north, the gray beds on the south, as well as the passage of interstratified coloured ones between them, are all Silurian rocks. There is no gap or interruption in the succession, as there always is at the base of the carboniferous formation.

I now come to discuss the lithological appearance and the fossil contents of those gray rocks, as compared with the Clonea slate, which is the true type of the calciferous slate, in the counties of Waterford and Cork.

Quarries of roofing slate have been worked at Benduff, two miles north-west of Roscarberry, on the Skibbereen roadside; also at the Leap; at Mohona, two miles south of Dunmanway; and many other places in the south of Cork. These appear to be all in clay slate belonging to the old grauwacké rocks (modern Silurian). In the quarry near Roscarberry, a large excavation has been made, and thousands of tons of the refuse are thrown about, but no trace of a fossil is to be found in the fragments. The slate in the quarry appears by the excavation to be fifty feet thick, and it is hemmed in at the sides by two vertical wall-like beds of gray grit.

Let us further compare the roofing slate of this county with the undisputed calciferous slate at Clonea, near Dungarvan. The features, both positive and negative, in this vicinity, are the vertical wall-like beds of gray grit, just described, visible at the sides of the slate quarry, 40 feet high. The abundance of gray grit in the vicinity; the total absence of fossils in the slate or grit; the total absence of old red sandstone of the red or yellow

colours, as the underlying rock; the absence of limestone, the overlying rock in the sequence, for many miles from this place; the facility by means of good cleavage with which the slate splits into good duchesses and countesses;—all those circumstances stand in strong contrast with the calciferous slate at Clonea, where the gentle dip—the abundance of fossils—the vicinity of the yellow or upper part of the old red sandstone, lying below it, and the usual gray limestone lying above; the total absence in it of gray, green, or brown grits; the soft decomposing aspect of the slate, and the imperfect cleavage, on account of which it will not yield even a lady, as the small slates are called by the quarrymen; no quarries of roofing slate of any value have ever been worked in it;—all these circumstances make it quite apparent that those two slates cannot belong to the same geological period. The two localities compared have no one rock, fossil, or character in common, except that the slates of both are of a gray colour when sound. The rocks about Roscarberry are like the similar gray grits and slates of the counties of Down, Armagh, Monaghan, of Cavan, or of Louth. They occur in undulations of great thickness, and in short have none of the usual characters or accompaniments of calciferous slate in this part of the country, coloured green on the map.

From this view, it is evident that all the calciferous slate, in the country between Cork Harbour and Crookhaven, making about 430 square miles, and coloured green on the latest edition (1856) of the Geological Map, must be replaced by the colour representing grauwacké or Silurian rocks, except any small basins of calciferous slate or coal measures, which may be found lying throughout the country in shallow troughs or hollows, which may be known by the lithological character of the rocks and by their fossils.

Carboniferous limestone.—Besides the observations I have already made on this rock, I shall make a few more with a view of explaining some additional circumstances regarding the rocks I have been discussing.

In the undulations formed by anticlinal ridges and synclinal hollows in the south-east of Cork and Waterford, to which I have before alluded, the synclinal hollows are often filled with calciferous slate or carboniferous limestone, or both. On examining the dips, it will be seen that the limestone is often found in a synclinal valley, having a gentle dip from both sides towards the centre. Sometimes it appears as if brought to its present condition by the more violent doubling up in folds of the strata of the underlying brown grit; sometimes those limestone masses have been let down into their troughs between



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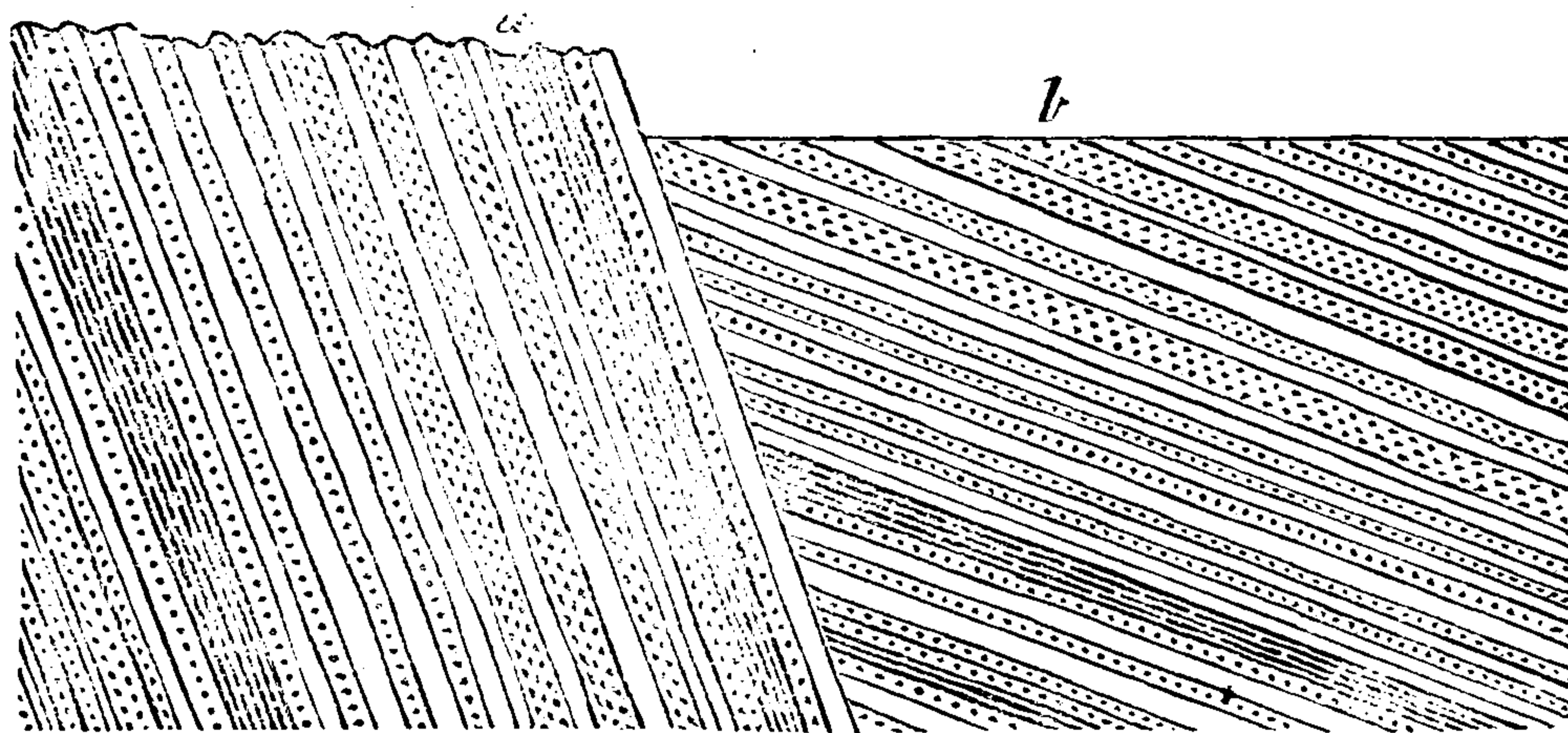
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quin, and thence to Ballyvoil Head, at the base of the steep ground to the north.

At Ballyvoil Head, the brown grit dips south 70° . The adjoining yellow sandstone, a few yards south of this spot, appears on the shore, between high and low watermarks, and dips south 20° . This difference in the dip in so short a distance, shows that the brown grit and the yellow rock at both these places are not conformable, and therefore the brown grit cannot belong to the carboniferous system, for if it did, the beds in both would be parallel when there is no intervening convolution (see fig. 4).

Fig. 4.

Section at Ballyvoil Head, near Dungarvan.



a. Brown grit, like the Silurian one at Dingle; dip south 70° .
b. Old red sandstone, upper part; dip south 20° .

Additional evidence of the unconformable sequence is afforded by the brown grit along the north bank of the river, near Lismore, and between that and Fermoy, coming quite close to the river in many of its bends, the limestone being but a few yards off to the south of it, as is clearly seen at Lismore, and thus leaving no room between them for the old red sandstone (yellow) and calciferous slate, as it does on the shore at Clonea, where the valley is more expanded.

Whether this unconformability was effected by a fault running in the direction of the north side of the valley, or by a regular sedimentary deposit on an old sea beach, I am not prepared to show, I merely state that it exists.

Coal Measures.—Mr. Ganly found fossils—(for Sir R. Griffith) in the townland of Ballymakean, near the Old Head of Kinsale—one of these was *Posidonia lateralis*, as determined by the late Professor Forbes. This fossil is abundant in certain beds there, but much wrinkled by distortion and cleavage. Four or five species of *Goniatites* were found there also by Mr. Francis Jennings of Cork, which were lent to Mr. Griffith, and the names determined by Professor M'Coy and recorded. All those fossils belong to the coal measures. There is no limestone visible

...over the coal shales here, and to find them at all in that position would be out of the usual sequence. The block containing them must have been let down into the adjacent Silurian grits in the same way as the block of limestone at Taghmon, already alluded to.

At Ballyheedy chapel, near the Ballinhassig station on the Cork and Bandon railway, black shales are found containing *Posidonia Becheri* and other forms. This is another fossil that I have never found anywhere except in the coal measures, or in some localities in thin limestone beds at their base. Like the Ballymakean district, there is no limestone seen at the surface here, and the limestone, if it be under the coal measures, as it must be, is buried between faults. This place I believe to be another great block of coal measures, let down by faults like that at Ballymakean, and like the Taghmon limestone. The coal shales, either at Ballymakean or at Ballyheedy, are not shown on the Geological Map.

From the foregoing observations it appears that there are many different rocks made to assume the character of yellow sandstone on the new Geological Map.

1. The coal measures of Cultra, of Ballinascreen, and of Drumkeeran, between Drumquin and Pettigo.

2. The long narrow bands on the external borders of the old red sandstone, round the Derrybrian Mountains, in the counties of Clare and Galway, adjoining the calciferous slate, and the numerous similar bands in Kerry, Limerick, Tipperary, and Waterford. Those very narrow bands belong to the upper part of the old red sandstone, and should not have been drawn on the map at all, because there is no visible boundary, or difference, between them and that rock to warrant making separate bands of them.

3. The yellow or upper part of the old red sandstone in all the midland counties of Ireland, or wherever else it occurs. This is the primary type of the whole.

4. The Silurian plant beds in Cork and Waterford.

5. Several imaginary bands drawn on the map, in the county of Cork, such as those supposed to exist in the country between Dunmanway and Roscarberry:

6. The beds with the green tint, or other indications of copper, between Ringabella and Mizen Head, especially in the vicinity of the Cappagh mine; these are clay slate and quartzite of the grauwacké series, and in no way like any part of the true carboniferous old red sandstone.

Another erroneous feature of the new edition of the Geological Map is the splitting up of groups of rocks into numerous subdivisions. In the carboniferous formation the old red sandstone is divided into nine subdivisions, each particularized on the map

by a different letter and colour. The yellow sandstone is divided into five; the calciferous slate into two; the lower limestone into four; the calp into six; and the upper limestone into five subdivisions. The coal measures are divided into—millstone grit, three; lower coal measures, two; upper coal measures, two: making in all thirty-eight subdivisions. The old red sandstone may contain some members of a lower formation. The six subdivisions of the calp are a fiction; and many of the others are often only the same beds modified by faults, or differing somewhat in character but described under a new name. The definitions given of some of them are so much like each other as to make them undistinguishable. The dividing of the four principal divisions of the carboniferous system into thirty-eight subdivisions of this kind, appears to me, therefore, to be not only a useless affectation of great accuracy, but to have a very embarrassing effect on geologists, and much more so on the public.

§ 4.

A paper by Messrs. Jukes and Salter was read before the Geological Society of Dublin, 13th June, 1855, entitled “Notes on the Classification of the Devonian and Carboniferous Rocks of the South of Ireland”, and is printed in the Society’s Journal, vol. vii. p. 63. In this paper they say—

“The authors during the last month had examined some of the principal sections in the south of Ireland, where the base of the carboniferous rocks and the upper part of the old red sandstone are to be seen, paying especial attention to the paleontological evidence. They have arrived at the conclusion that it is impossible to separate the so-called yellow sandstone of the south from the old red sandstone, on account of their physical union alone”.

After enumerating the names of some plants, they again say:

“The yellow sandstone with these characters forms the upper part of the old red sandstone all along the south of Ireland, from the Hook in Wexford to the shores of Bantry Bay”.

It is not to be wondered at if they found it impossible to separate rocks physically which do not exist in this part of the country; the only wonder is that, not being able to separate them physically, they could still recognize them, as they do in the same page: “All along the south of Ireland, from the Hook in Wexford to the shores of Bantry Bay”. How could they recognize two groups of rock which they found it impossible to separate?

Speaking of a subdivision of those rocks called Coomhola grits, page 66, they say:



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them, as I trust I have already explained. Mr. Francis Jennings, of Brown-Street, Cork, has, I believe, a number of specimens from Glinny quarry in his cabinet.

I shall now make an attempt at comparing the south of England with the south of Ireland, Devonshire with Cork, by means of the lithological characters of the rocks and the fossils in each.

South Devon and Cornwall seem to have been so much disturbed in the geological succession of the rocks, probably by the causes which accompanied the protrusion of the several granite districts, that it is perhaps vain to attempt to classify their rocks by any knowledge we may possess of those in Ireland, where the sequence, especially in the carboniferous system, is pretty regular. No comparison can be made between this and any other place with a satisfactory result. North Devon is different, and is therefore eligible as a subject for comparison.

This district is bounded on the west by the Atlantic; on the north by the Bristol Channel; on the east, near Williton and Wiveliscombe, it is covered up by new red sandstone; and on the south, it is bounded by a low valley, nearly coinciding with a line drawn across the map of England, from Barnstaple to Clayhanger.

Sir Henry De La Beche has written, and cited from others, a good deal regarding this North Devon district, in the Report of the Geology of Cornwall, Devon, and West Somerset. I shall not follow him in detail. He calls the whole area *grauwacké*, and says, at p. 40, that

“The value of the Cambrian and Silurian researches of Professor Sedgwick and Mr. Murchison cannot be doubted. The latter geologist has devoted several years to the detailed study of the upper part of the *grauwacké* group”.

Again, p. 130.

Note—“In 1836, Professor Sedgwick and Mr. Murchison divided the *grauwacké* of North Devon into five subordinate groups”.

In 1837, Professor Sedgwick and Mr. Murchison read a paper before the Geological Society of London, printed in vol. ii., p. 566, of their Transactions. They conclude that the minor groups of North and South Devon are newer than the rocks of Snowdon and central Cumberland (the Cambrian of Professor Sedgwick), and older than the Silurian system of Mr. Murchison.

“At the meeting of the British Association for the Advancement of Science, held at Liverpool in 1837, the Rev. D. Williams divided this *grauwacké* (North Devon) into seven minor groups, and gave an account of plants found in it”.

“In January, 1838, Mr. Weaver read a paper to the Geological Society

of London, on the 'Geological relations of North Devon', in which he subdivided the rocks of the district into six subdivisions, and said they constitute a peculiar transition group".

I give these quotations to show that all the geologists who visited, and wrote upon, North Devon, were of opinion that it is grauwacké, or transition rocks, or Silurian, which all mean the same thing.

Sir Henry, at p. 48 of the Report, etc., describes the Combe-martin limestone, the slates at Ilfracombe, the red, brown, and gray arenaceous beds at Morte Bay, succeeded by other arenaceous beds, generally gray or brown, and schistose or micaceous, and containing casts of shells much resembling those of a *Cucullæa*, etc., etc. I need not quote his descriptions in detail, but merely add, that the rocks of North Devon, which he describes, the red, brown, green, and gray grits, and the red, green, purple, and gray slates, with their several intercalations, recal vividly to my mind the appearance of rocks near Dingle, in the Killarney, Kenmare, and Boggra Mountains, at Glengariff, Dunmanway, and Kinsale. His descriptions afford good lithological characters of the rocks in a hundred localities in Cork and Kerry. In short, I consider the rocks of Cork as equivalents of those of North Devon as exactly as can be described, and both truly Silurian.

As regards the fossils, I believe I cannot do better than give the names of those of North Devon, as described by Dr. Phillips in his Palæozoic Fossils. It is a district acknowledged to be Silurian by all the geologists who visited it. I will select the fossils from his table, and the localities both from the table and descriptions, and put them into a tabular form; and, instead of enumerating all the species found in each locality, I will classify them into districts. I shall also give one locality in the mountain limestone or calciferous slate of Ireland, opposite to the name of any of the fossils which I found in that rock, so as to indicate those which may be common to the carboniferous system of Ireland and the Silurian of North Devon.

TABLE OF FOSSILS.

NORTH DEVON SILURIAN FOSSILS AND LOCALITIES.	IRISH CARBONIFEROUS LOCALITIES.
LINTON.	
Petraia pluriradialis, ¹	... Currens, Tralee, Kerry, scarce.
Fenestella antiqua,	... Currens.
Favosites polymorpha,	... —
Actinocrinus tenuistriatus,	... Clonea, Dungarvan, Waterford.
Orthis sordida,	... —

¹ was *Turbinolopsis pluriradialis*.

FOSSILS—CONTINUED.

NORTH DEVON SILURIAN FOSSILS AND LOCALITIES.	IRISH CARBONIFEROUS LOCALITIES.
Orthis longisulcata,	... Ballinacourty, Dungarvan, Waterford.
Orthis compressa,	... Castle Espie, Comber, Down.
Spirifer aperturata,	... Clonea.
Spirifer lævicosta, ²	... Clonea, <i>common</i> .
WOODABAY.	
Pterinea spinosa,	... —
Orthis interlineata, ³	... Currens, <i>common</i> .
Orthis granulosa,	... Ballinacourty.
Pleurotomaria aspera,	... —
Bellerophon subglobatus, ⁴	... —
Bellerophon striatus,	... Derryloran, Cookstown, Tyrone.
COMBE MARTIN.	
Cyathophyllum cæspitosum,	... —
Stringocephalus Burtini,	... —
ILFRACOMBE.	
Cyathocrinus variabilis,	... Ballinacourty, <i>common</i> .
CANNINGTON PARK.	
Cystiphyllum Damnoniense,	... —
Millepora similis,	... St. Doulough's, Dublin.
HAGGINTON.	
Fenestella anthritica,	... —
BAGGY POINT.	
Cypricardia Phillipsii, ⁵	... —
Nucula plicata,	... —
Nucula lineata,	... Lisnapaste, Ballintra, Donegal.
Avicula cancellata,	... —
Avicula reticulata,	... —
Athyris concentrica,	... Lisnapaste, <i>common</i> .
Spirifer calcaratus,	... Lisnapaste.
Spirifer disjunctus,	... Currens.
Spirifer rudis,	... Ballinacourty.
Rhynchonella laticosta, ⁷	... Kildress, Cookstown, Tyrone.
Natica meridionalis,	... —
Pleurotomaria expansa,	... —
Pleurotomaria gracilis,	... —
Bellerophon Urii,	... Cookstown, Tyrone.
Bellerophon trilobatus,	... —
Orthoceras tentaculare,	... —
CROYDE BAY.	
Glaucanome bipinnata.	... Killymeal, Dungannon, Tyrone.
Ceripora gracilis. ⁸	... Clonea, <i>common</i> .
Leptæna analoga.	... Millecent, Naas, Kildare, <i>common</i> .
Leptæna convoluta.	... Hook, Fethard, Wexford.
Strophalosia caperata. ⁹	... Malahide, Dublin.
Rhynchonella pleurodon.	... Millecent, <i>common</i> .
Orthoceras lineatum.	... —
MARWOOD.	
Cucullæa amygdalina.	... —

2 Spirifer ostiolata.
3 was Orthis parallela.
4 was Bellerophon globatus
5 was Cypricardia impressa.

6 was Spirifer decussata.
7 was Terebratula laticosta.
8 was Millepora gracilis.
9 was Leptæna caperata.



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are of an intermediate age between the carboniferous and Silurian systems, and consequently of the age of the old red sandstone. It is necessary to add that Mr. Murchison has shown that there is a regular passage from the old red sandstone upwards into the carboniferous system, and downwards into the Silurian, and that the suites of fossils of the two systems are perfectly distinct”.

Sir Roderick Murchison, in his *Siluria*, p. 257, says:

“The highly important deduction, however, of Mr. Lonsdale, that the fossils of the South Devon limestone really exhibited a character intermediate between those of the Silurian system and of the carboniferous limestone, was the most cogent reason which induced Professor Sedgwick and myself, after identifying North and South Devon, to propose the term Devonian”.

I shall make a few observations on these Devonian rocks thus based on Mr. Lonsdale's conclusions, and which appear to have been founded upon unsound premisses, and therefore unworthy of being retained in our science.

The complete insulation of North Devon, the absence of any doubtful rocks within the boundaries described, and the undoubted fact that it contains the fossils of a division of the Silurian or grauwacké rocks only, on the one hand, and the certainty that the carboniferous limestone of Ireland cannot be mistaken for any other rock, on the other, contribute together to make these two systems and the two localities the most eligible for a comparison of the fossils of both.

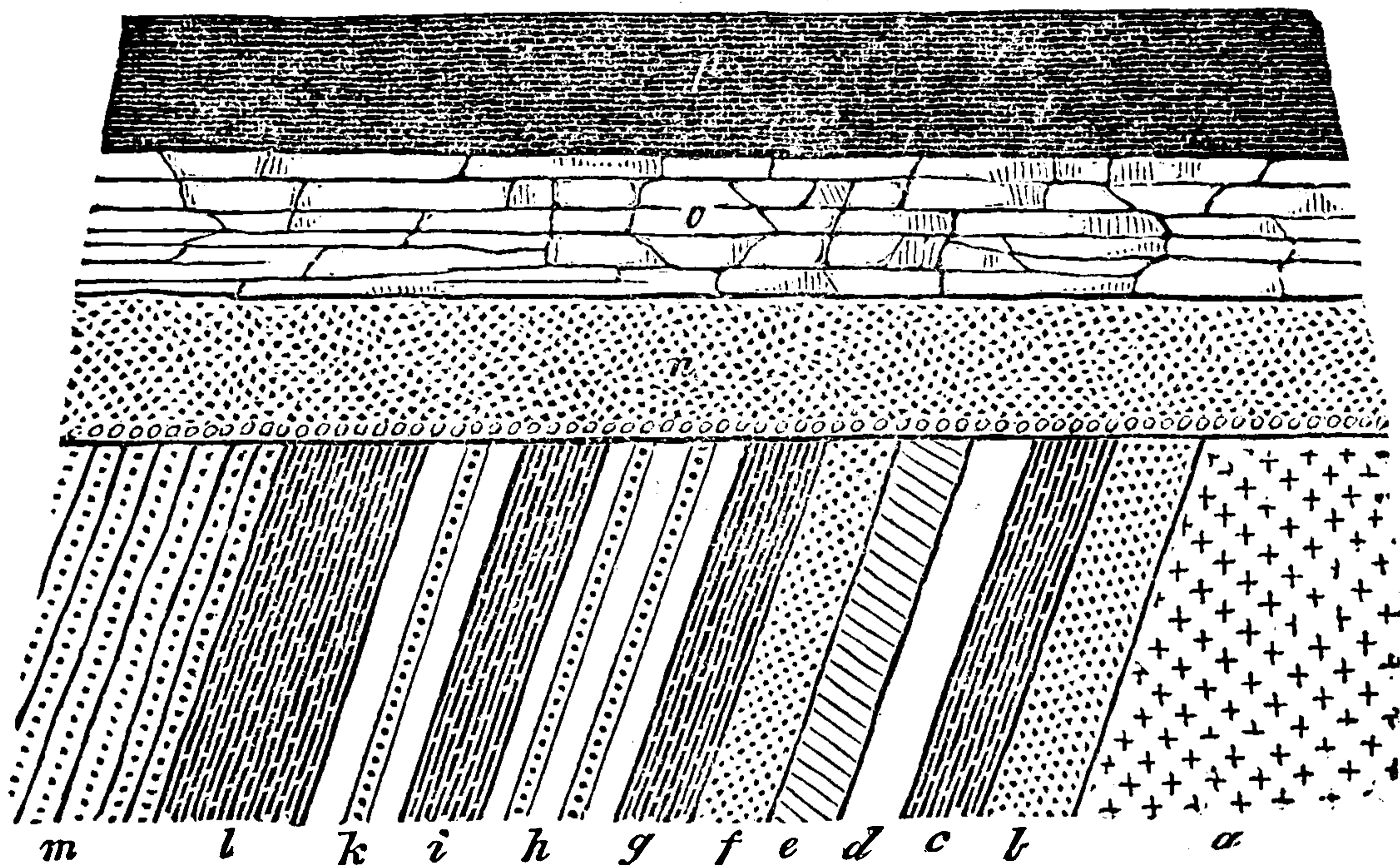
From the two foregoing quotations, it appears that Mr. Lonsdale depended on Sir R. Murchison's statements for the opinion he entertained regarding the fossils, and the authors of the Devonian system depended on Mr. Lonsdale's conclusions for founding the new system. More recent investigations have shown that Sir Roderick's statements, as given by Mr. Lonsdale, are not general.

At a meeting of the Geological Society of Dublin, I read a paper entitled “Researches among the Palæozoic Rocks of Ireland”,¹⁶ etc. In that paper I drew up a table made out from seventy-eight localities in Ireland, where junctions are visible of the old red sandstone lying on the inferior rocks, and recorded the dips of the upper and lower rocks at those junctions. I stated that after those older inferior rocks had undergone a great physical change, and their beds became upturned on their edges, the old red sandstone was the first layer or foundation of the new overlying system (the carboniferous) which was deposited; that it was laid down upon the edges of the older rocks as they happened to present themselves; that it rests on mica slate, on gray

¹⁶ Dub. Geol. Jour., vol. vii. p. 115.

clay slate, on gray grit, on gray slate and grit interstratified, on green grit, on brownstone or brown Silurian grit, on brown micaceous flag, on yellowish white stratified quartz rock, on yellow amorphous quartz rock, on brown porphyry, on greenstone, on granite, and that the old red sandstone in Ireland lies everywhere unconformably on those inferior rocks, and consequently that there is no passage upwards from those old rocks into the carboniferous system. See fig. 5.

Fig. 5.



a. Granite; b. Stratified quartz rock; c. Mica slate; d. Primary crystalline limestone; e. Greenstone; f. Amorphous quartz rock; g. Gray clay slate; h. Gray grit; i. Red clay slate; k. Green grit; l. Green chloritic slate; m. Brown Silurian grit; n. Old red sandstone; o. Mountain limestone; p. Coal measures.

Sir Henry De La Beche, in the *Memoirs of the Geological Survey of Great Britain*, vol. i. p. 60, in describing the country going westward from the Vans of Brecon, says:—

“Proceeding towards Caermarthen, not only do we appear to find a mingling of sand more, at the same geological time, westward than eastward, but also *an overlap of the higher arenaceous and conglomerate series* upon the lower and marly accumulations of the old red sandstone; the carboniferous limestone and coal measures over the Silurian rocks”.

The old red sandstone referred to above, is that of Hertfordshire, now known to belong to the Silurian system, and the *overlap of conglomerate* is the base of the old red sandstone (carboniferous) of South Wales, lying on it unconformably, showing that there is no passage upwards from the Silurian into the carboniferous rocks.

Professor Sedgwick, in his introduction to the *British Palæozoic Fossils*, p. 28, says:—

“Though the Devonian series of the Herefordshire type seems to pass downwards into the upper Silurian groups, it does not appear to pass

upward into the carboniferous. There is generally a paleontological and physical gap between them, which is in many places indicated by the upper conglomerates of the old red sandstone”.

This physical and paleontological gap is the unconformable sequence at the base of the old red sandstone.

From this it appears that Sir H. De La Beche and Professor Sedgwick both think that there is no passage upwards from the Hereford grits (Silurian) into the carboniferous rocks of South Wales. I have shown that there is no such passage in Ireland from the Silurian system into the carboniferous.

Mr. Lonsdale in the foregoing quotation says:—

“It is necessary to add that Mr. Murchison has shown that there is a regular passage upwards into the carboniferous system and downwards into the Silurian, and that the suites of fossils of the two systems are perfectly distinct”.

Here are two assumptions of great importance in geology, both of which turn out to be groundless. I have discussed the first; and as to the second, the little table of North Devon fossils shows that the suites of fossils *are not* perfectly distinct: nearly half of them are common to the two systems. Mr. Lonsdale's reasoning therefore does not apply. We must reject his conclusion, and with it the cogent reason that induced the authors of the Devonian to propose that name.

Paleontologists appear to have been too stringent in appor-tioning every fossil to a particular system. *Trinucleus concentricus* is a fossil peculiarly characteristic of the Silurian formation, and of the lower division of it too. *Leptaena analoga* is very abundant in the carboniferous. I got distinct and well marked specimens of those two fossils in one piece of gray limestone at the Chair of Kildare, a Silurian locality. The *Leptaena analoga* was not any of the small varieties which resemble it, but a fine full-grown specimen, with a hinge more than two inches long, and the upper valve convex, not depressed; such a specimen as may be obtained by hundreds in the mountain limestone at Millecent, near Naas, in Kildare, or in the calciferous slate at Ring, one mile north-east of Enniskillen.

It appears to me that the same fossil has often got different names, when it happens to be found in different formations. *Leptaena depressa* of the Silurian rocks, and some varieties of *Leptaena analoga* of the carboniferous, are two of these. *Rhynchonella borealis*, of the Silurian, and *Rhynchonella pleuroden*, are two others. It would be a great advantage to geology if more of our fossil shells could be examined and revised by such a man as Mr. Davidson.



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The lyric form and want of individual characterization in the dramas repel the reader unacquainted with Spanish literature.

The *Autos* are unique;

in them man is not moved by hidden passions, etc., but the passions are themselves embodied and appear before us as actors in the drama, contending for his soul.

readers who have not been prepared by some preparatory studies in Spanish literature, to know what they are really to expect in Calderon, are repelled, perhaps disgusted, by the lyrical form, as well as what must appear to them the undramatic absence of individual characterization, so frequently felt in perusing his purely secular dramas. The intricacies of his plots in some, and the splendid bursts of poetry that irradiate others, have their separate admirers; but the want of such life-like portraitures (except in a few rare instances) as so frequently adorn the British stage, destroys altogether that apparent reality and vraisemblance which is the very soul of dramatic illusion, and provokes comparisons most injurious to that literature in which no identity of intention or conception can properly be traced, or should properly be looked for. But in the *Autos* there can be no silent appeal to those forms, perhaps prejudices, interwoven with the social threads of a nation's existence for more than two centuries. They have no types, they have no substitutes in the dramatic literature of any other country. Emphatically may it be said of these, that none but themselves can be their parallel. In these marvellous allegories it is not the spectacle of private sorrow, or the exhibition of public virtue, that we are called upon to witness. It is not the individual man moved and moulded by the unseen springs and influences of his passions and his beliefs, who is the hero of the scene; but it is these shadowy entities themselves, and a thousand others of the like description, that take bodily shape before us, all contending in rivalry for the soul of man—the eternal weal or woe of which (however varied may be the ordeal) forms the interest of the story, and finally produces the catastrophe of the plot. To this end everything in nature and in the soul of man contributes. The Earth and the Seasons, the Days and the Hours, the Sea and the Sky, Faith and Incredulity, Christianity and Paganism, the Prince of Darkness and the *Divine Orpheus* himself, who commences the work of creation with music and song, and finally restores the lost Eurydice of Human Nature to its state of original innocence and grace—with a thousand other idealisms, pass across the scene, all delineated with the same copious fertility of imagination, and for the most part speaking to us in strains of the utmost purity and harmony.⁵

⁵ Speaking of this wonderful Spanish drama in its religious aspect, the Protestant Louis Schack, its learned German historian, says: "A temple is thrown open to us, on entering which we feel as it were the

It is not my intention at present to attempt any general analysis or description of these remarkable productions. Indeed after the admirable sketch with which a distinguished dignitary of the Protestant Church in England⁶ has prefaced his own translated specimens of one of them in the little volume referred to in the note, the effort would be as difficult as perhaps it is unnecessary. For deep insight into the profound significancy of these allegories, and for a cordial appreciation of their poetic and even religious merits, no better guide can be found in English Literature than this. My object on this occasion is to present one entire *Auto*, without abridgment, substitution, or alteration of any kind, imitating, as far as my command of the English language would permit me, the most difficult and peculiar versification of the original, an attempt which, I may be permitted to say, has never been made in English to the same extent, and, with respect to Calderon, to *any* extent, except in the specimens introduced into Dean Trench's analysis of *The Great Theatre of the World*, etc., already alluded to.

Author's object not to give a general analysis,

but to translate one entire *Auto* in versification of the original;

an attempt not hitherto made to the same extent.

Upon this subject of Spanish versification I shall have a few words to say presently. In the meantime a brief account of the number of Calderon's *Autos*, and an allusion to the class of which *The Sorceries of Sin* may be considered a type, may not be unacceptable.

In Mr. Ticknor's valuable *History of Spanish Literature* there appears (to me, at least) a slight confusion in his account of the time at which the *Autos* were first published. In the text there is a statement that these "*Autos*, or Dramas for the Corpus Christi Day", are the only ones which Calderon "thought worthy of his care in publication"; while in the note on the same page the following passage is given, which seems irreconcilable with it. "The *Autos*", says Mr. Ticknor, "being the property of the city of Madrid, and annually represented, were not

Mr. Ticknor not correct in his statement of the time at which the *Autos* were first published.

breath of eternity blowing upon us, while a holy flush of morning, like a reflection of the Divine Glory, undulates through the awful precincts, In the middle rises the cross, as the centre-point of all life and history, on which the Infinite Spirit, in infinite goodness, was offered a sacrifice for mankind. At the foot of this sublime symbol stands the poet, as priest and prophet, and interprets the images on the walls, and the dumb language of the tendrils and flowers which twine up the pillars, as well as of the tones which reverberate from the vaulted roof".—*Geschichte der dramatischen Kunst und Literatur in Spanien*, vol. iii., book iii., p. 253.—RAMBLER, December, 1855, p. 407.

It is singular that this admirable work of Schack has not yet been translated even into Spanish.

⁶ Dean Trench, in his *Life's a Dream: The Great Theatre of the World*, from the Spanish of Calderon. London, 1856.

permitted to be printed for a long time. They were first published in 1717, in six volumes, quarto, and they fill the same number of volumes in the edition of Madrid, 1759-60, quarto"—*Hist. of Sp. Lit.*, vol. ii. p. 319). That the Autos contained in these editions were *ifirst* printed in 1717 is certainly inaccurate, as I have in my own possession a volume containing twelve of them which was published at Madrid in 1690. This, though not called so on the title-page, is described in the *Suma de la Licencia*, as being "PRIMERA Parte de Loas y Autos Sacramentales escritos por Don Pedro de la Barca", suggesting the probability that subsequent volumes of this edition were published. In the forty-seventh volume of the *Biblioteca de Autores Espanoles*, published only last year, which forms the first volume devoted to dramatists subsequent to Lope de Vega, there is a chronological and alphabetical catalogue of dramas which appeared in Spain between 1635 and 1740, or from Calderon to Canizares. This catalogue gives a list of Calderon's Autos, which contains fourteen that are not to be found in the six quartos above referred to; omits two, which those volumes contain; and alters the names of two others, if indeed these last are not different *autos* altogether.⁷

The
Auto
here
trans-
lated not
given
as the
best spe-
cimen.

The Sorceries of Sin, in this paper, is not offered as the most perfect or beautiful of the Autos—indeed it is surpassed by many of them in splendour of poetry and originality of invention. It is, however, a favourable specimen of its class, and as such has been selected, with ten others, by the only translator of these singular dramas, which even German enthusiasm for Calderon has as yet tempted to undertake the task.⁸ My preference for it

⁷ Among the new *autos* mentioned in the list of Don Ramon de Mesoneros Romanos, referred to above, is one called *Devocion de la Cruz*. This is not to be confounded with the terrible tragedy of that name which Bouterwek so strangely mistook for an *Auto*, a translation of which, by the writer of the present paper, is almost ready for the press. Another of the new Autos is *Cruz en la Sepultura*. This is curious, and adds somewhat to the confusion already surrounding *The Devotion of the Cross*, this tragedy having been first published (imperfectly, I believe) under an almost similar title, "*La Cruz de la Sepultura*", in the *Parte Viente y Ocho de Comedias de Varios Autores*, Huesca, 1634, where it is, erroneously of course, attributed to Lope de Vega. See *Notas e Ilustraciones* to the edition of Calderon's *Comedias*, by Hartzenbusch, vol. iv. p. 701. See also *Dramaticos posteriores a Lope de Vega*, vol. i. p. 38. The promise of new treasure in this list of Autos adds greatly to the interest which the expectation of a new edition awakens.

⁸ Geistliche Schauspiele von Don Pedro Calderon de la Barca, von J. F. von Eichendorff. Two vols. Stuttgart, 1846-53. The German translations of the *Comedias* are numerous. Among those in my own



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It would be more satisfactory as supplying the means of immediate comparison, to publish the translation of *Love the greatest Enchantment* with that of *The Sorceries of Sin*. This I purpose doing in another form and at another time. The *Auto* in itself, I should hope, will not be unacceptable to the readers of the ATLANTIS, as presenting (however imperfectly) the only complete version that has ever appeared in English, of one of "those marvellous compositions", of the greater number of which, says the distinguished writer¹⁰ I have more than once referred to, "it is not too much to say, that they are hymns of loftiest praise to redeeming love,—summonses to all things which have breath, to praise the Lord; and he too that writes, writes as one that has seen Satan fall like lightning from Heaven, and rejoices in spirit with his Lord".¹¹

This the only complete version in English of an *Auto*.

Brief observations on Spanish versification.

It remains for me to add (for those who have not turned their attention to the subject) a few words on Spanish versification, an attempt at reproducing which forms the principal feature of this translation. In addition to the metrical forms known to most modern languages, the Spaniards have one which is almost confined to themselves,¹² and which, except in some accidental resemblance to be

¹⁰ Dean Trench in *Life's a Dream*, etc., p. 93.

¹¹ The opening scene of *The Sorceries of Sin*, and still more the analogous one in *Love the greatest Enchantment*, will not unfavourably recall the similar scene in *The Tempest*. The allegory in this part of the *Auto* seems to have been a favourite one with religious writers long preceding the time of Calderon. If the reader refers to the dedication of the fourth part of the *Paradisus Animæ*, he will find a remarkable coincidence in the work of one who may be called a contemporary writer. The allegory in this passage is, however, forced and strained beyond the limits of Calderon's taste and judgment. The introduction of *El Entendimiento*, or *The Understanding*, as a personal entity, is to be met with in other writers beside Calderon, as in the *Templo Militante* of Cayrasco, a remarkable work, and a remarkable, though almost forgotten writer. See *El Templo Militante*. Lisboa, 1615, part 4, p. 140.

¹² The fact of the Portuguese having to a certain extent adopted the *asonance* in some departments of their poetry, can scarcely be considered an exception to this statement. The circumstance of two of the southern nations of Europe *asonating* in their versification has been considered by some investigators into the philosophy of language, as having arisen in obedience to certain laws and impulses existing among them, analogous to those which, among most of the northern nations, have stamped *alliteration* as the distinguishing mark of their poetical expression. If the *asonance* were indeed diffused to the same extent, the adoption of such striking contrasts in the production of rhythmical harmony, would be certainly a curious and interesting subject of inquiry. But when we find the *asonance* confined to one particular people, when we can discover no trace of it in the most southern dialects of the Italian peninsula, or in any of the forms of the Italian language, which is as soft and suitable for its reception as the language in which it has taken root, its cause must be looked for alone in the caprice, or convenience, of that nation which has exclusively appropriated it to itself.

found in early Christian hymns, which, however, rather appear to be faulty rhymes in the ordinary sense of the word, than intentional *asonante*¹³ ones, as this form of versification is called, as well as some apparently more real resemblance in Celtic and Gaedhlic poetry, is unknown in the literature of any other nation. With regard to its appearance in Celtic poetry, if the reader will refer to Mr. Curry's interesting papers in previous numbers of this journal, he will find in the metrical lines of the original Irish frequent instances of a similarity of *vowels* in the last accented syllables of lines, while the *consonants* are entirely different. On this subject I speak with great diffidence, my ignorance of the Irish language not enabling me to know how far the *sound* of these vowels may carry the rhyme beyond the limits of the asonance, and thus in reality make them full consonant rhymes. To return to the Spanish *asonante*: "It is", says the late Lord Holland, "a word which resembles another in the *vowel* on which the last accent falls, as well as the vowel or vowels that follow it; but every consonant after the accented vowel must be different from that in the corresponding syllable. Thus: *Tòs* and *amòr*, *orilla*, and *delira*, *àlamo* and *paxaro*, are all *asonantes*".¹⁴ This definition, though perhaps a little too limited for the boundless variety and freedom of the asonance, may be considered tolerably satisfactory. The rhyme (such as it is) is not confined as in all other languages to a few repetitions, of which those in the octave stanza are perhaps the most frequent; but in Spanish the *same* asonance, that is, the same recurring similarity of vowel or vowels in the last accented syllable or syllables of every second line, is kept up unchanged, however long may be the ballad or the scene in which it is commenced. In Spanish, from the open sound of the vowels, and from the copiousness of the language, this is easy. In fact it is said that the difficulty lies not in producing the *asonante* where it is required, but in avoiding it in the intermediate lines where it is superfluous. But in English the case is very different; from the comparative weakness of the vowel sounds, from the rare possibility of combining them, and what is still worse, from their perpetual variation in quantity, anything like

The Spanish *asonante* apparently found in Irish poetry.

Lord Holland's definition of the *asonante*.

The same asonance in Spanish throughout a scene.

More difficult to avoid than produce the *asonante*;

but in English it is very different.

¹³ This word is generally written *assonant* in English. For a thing so entirely Spanish, perhaps the Spanish form is the more appropriate one, and I have therefore followed Lord Holland and Mr. Ticknor, in calling it by its original name.

¹⁴ Life of Lope de Vega, vol. ii. p. 215.

The adoption of the *asonante* tends to render the translation closer.

producing the same effect as in the Spanish is impossible. Yet this "ghost of a rhyme", as Dr. Trench calls it, is better than none at all, and I have found from my own experience, that an inflexible determination to reproduce it, at whatever trouble, even though with imperfect success, enables the translator more closely to render the meaning of the original, and saves him from the danger of being tempted into diffuseness by the facilities for expansion which an uncontrolled system of versification supplies. Translators who have felt the weight of too much liberty, might find within the restricted limits of the *asonance* the same salutary restraints which Wordsworth found in the sonnet—it is to be hoped with a portion of the same success.

Reason why the original Spanish is also printed.

I have printed the original text side by side with the translation, notwithstanding the trying ordeal which any version would be exposed to by such a juxtaposition, partly because copies of the *Autos* are becoming scarce, and are not likely to be in the possession or within the reach of some of my readers; and partly from the light which, even to those who are but slightly acquainted with Spanish, will, I feel, be thrown upon the obscurity or baldness of my translation by a glance at the opposite column. It is not, I need scarcely say, a challenge as to verbal exactness, feeling convinced that those who will most clearly detect the errors of the translation, will be the readiest to acknowledge the difficulties of the task, and to overlook the defects of its execution.¹⁵

15 [The subject of Versification in the ancient Irish language has not yet, perhaps, been sufficiently investigated to enable the philologist to decide, by a comparison between ancient Irish and Spanish poetry, whether the ancient Irish did not form one of the same group with those southern nations of whom Mr. Mac Carthy speaks above, (note 12), as distinguished from the northerns by the use of the *asonance*, "in obedience to certain laws and impulses existing among them". But it is certain that the rules of Gaedhlic Verse contemplate an *asonance* or agreement of the vowels alone as necessary to rhyme; though it frequently happens (the Gaedhlic *asonance* not being restricted so narrowly as to agree with Lord Holland's definition) that the rhyming words used are accidentally such as do "carry the rhyme beyond the limits of the *asonance*", and thus become "full consonant rhymes" also. In Dr. O'Donovan's Irish Grammar (p. 412, et seq.) the *ḡán díreac* or 'direct metre' is described as composed of quatrains, each line of a certain definite number of syllables; each quatrain (called in Gaedhlic the *ḡann iomlán*), consisted of two couplets, or four lines; (in the examples below each couplet is printed in a single line, as generally written in the MSS., though containing two in fact); the first couplet was called *ḡeolac* 'leading', the second *comac* 'closing'; each *ḡann* or quatrain should make perfect sense in itself, without dependence on the next. In these quatrains the rhythm is stated to have required two things; 1^o *uaim*, or 'Concord', as Dr. O'Donovan translates it, which was a kind of alliteration; 2^o *com-ada*, or 'Correspondence', which appears to have been identical with the Spanish asonant or vowel rhyme. The rule of 'Concord' was, that in each of the four lines some two words (neither of which should be a preposition or a particle) should commence either with *the same* consonant or with *some* vowel; if the last two words in



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PERSONAS.

EL HOMBRE.

LA CULPA.

LA LASCIVIA.

LA LISONJA.

EL ENTENDIMIENTO.

LA PENITENCIA.

EL OLFATO.

EL OIDO.

EL TACTO.

EL GUSTO.

LA VISTA.

MUSICOS.

ACOMPANAMIENTO.

*Suena un Clarin, y se descubre una Nave, y en ella el Hombre, el Entendimiento,
y los cinco Sentidos.*

Entend. En la anchurosa Plaza
del mar del Mundo, oy hombre te amena
gran tormenta.

Oïdo. Yo he sido
de tus cinco sentidos el Oïdo,
y assi el primero siento
bramar las ondas, y gemir el viento.

Vista. Yo, que he sido la Vista,
que al Sol los rayos perspicàz conquista,
desde lexos diviso
uno, y otro uracàn, à cuyo viso
en esta cristalina
campaña te previene fatàl ruina.

Tact. El Tacto soy, à horrores te provoco,
pues yà cercanos los peligros toco.

Olfat. El Olfato te dice, que se crea
El humedo vapor de la marèa.

Gust. Yo en trance tan injusto,
con ser el Gusto, estoy aqui sin gusto.

Oïdo. Gran tormenta corremos.

Ent. En el Mar de la vida nos perdèmos.

Tact. Larga aquella mayor.

Olfat. Iza el Trinquete.

Gust. A la Triza.

Oïd. A la Escolta.¹⁶

Vist. Al Chafaldete.

Entend. En alterados hielos
corre tormenta el hombre.

Todos. Piedad, Cielos!

Homb. En el Texto Sagrado,
quantas, veces las aguas se han nombrado,
tantos doctos Varones

¹⁶ Should obviously be *Escota*.

PERSONS.

THE MAN.	THE SMELL.
SIN.	THE HEARING.
VOLUPTUOUSNESS.	THE TOUCH.
FLATTERY.	THE TASTE.
THE UNDERSTANDING.	THE SIGHT.
PENANCE.	MUSICIANS, CHORUS, ETC.

A trumpet sounds, and a ship is discovered at sea. In it are 'The Man, The Understanding, and the five Senses.

Underst. Upon the boundless plain of the World's wide sea,
O Man! this day doth darkly threaten thee
A mighty tempest.

Hearing. I who am the Hearing
'Mong thy five Senses called, perceive the nearing
Of the impending storm; to me is known
First when the waves grow hoarse and winds begin to groan.

Sight. I who am called the Sight—
Swift victor of the great Sun's golden light,—
With power to look between
Each whirlwind wild that breaks the blue serene,
Foreseeing, can behold the coming woe
That on this crystal plain this day thou 'rt doomed to know.

Touch. The Touch am I, harrowing thy soul so much,
That dangers closing round thee seem to touch.

Smell. Smell, too, proclaims how near doth ruin glide,
Even by the humid vapours of the tide.

Taste. For such a tumult of the sea and sky
No taste I feel, though Taste itself am I.

Hearing. We run before the wind.

Underst. Storm-tost,
Upon the sea of life our bark is lost.

Touch.
Loosen the mainsheet.

Smell. Hoist the foresail, ho!

Taste. To the cable!

Hearing. To the tack-rope!

Sight. Let the clew-lines go.

Underst. Over the waves by mighty tempests driven,
Man struggles on.

All. Have pity, gracious Heaven!

Man. In the sacred text do we
Find frequent mention of the waves of the sea,
Which learned doctors all translate

las suelen traducir tribulaciones,
 con que la humana vida
 navega zozobrada, y sumergida.
 El Hombre soy, á astucias inclinado,
 y por serlo, oy Ulises me ha nombrado,
 que en Griego decir quiere
 cauteloso : y assi, quien oy quisiere
 correr las lineas de la suerte mia,
 de Ulises siga en mì la Alegoria :
 y los que en una parte
 me llamaron viador, viendo mi arte,
 y en otra navegante, que el camino
 del Mar discurro siempre peregrino,
 dando ocasion à que ningun viviente
 se admire de peligro tan urgente :
 y assi nadie se espante,
 que Ulises peregrino, y navegante,
 con inquietud violenta,
 corra tanta tormenta,
 confusos, y perdidos
 en mis tribulaciones mis sentidos.

Oïdo. Solo se escuchan en la selva fria
 ráfagas, que nos dàn por travesía.

Vista. Solo se ven en esos crizontes
 montes, que se deshacen sobre montes.

Tacto. Solo se tocan ondas, con quien sube
 el mar, que nace mar, à morir nube.

Olfat. Uno son yà los dos azules velos.

Gusto. Què nos vamos à pique.

Todos. Piedad, Cielos!

Entend. Si los llamas, serenidades crea
 vuestro temor cobarde, y que no sea
 este Baxèl, que en pielagos se mueve,
 sepulcro de cristal, tumba de nieve,
 que el Cielo, à humildes voces siempre abierto,
 al naufragio Piloto es feliz Puerto.

Gusto. Acordemonos dèl, aora que estamos
 en riesgo los que el Mundo navegamos.

Ent. Dadle voces en tales desconsuelos,
 pues èl siempre responde.

Todos. Piedad, Cielos!

Oïdo. Yá escucho, que se llena
 de paz la vaga habitacion serena.

Gust. Y el Mar tranquilo, yá con ira suma
 no riñe, sino juega con la espuma.

Ent. Todo el ayre es cambiantes, y reflexos.

Vista. Todo es serenidad, y yà no lexos,
 antes que todos miro



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cumbres, que tocan al azul Zafiro,
del Mar burlando la sañuda guerra.

Ent. Zelages se descubren: tierra, tierra.

Homb. Prudente Entendimiento,
Piloto, que al gobierno està atento
de aquesta humana Nave,
que nadar, y bolar à un tiempo sabe,
siendo en mansiones de atomos de espumas,
sin escamas Delfin, Cisne sin plumas,
pòn la Proa en aquella
Montaña, en quien la mas luciente Estrella
peligra, pues su cumbre
es en donde se roba al Sol la lumbre:
y assi sus puertas inconstantes cierra
à este humano Baxèl.

Todos. A tierra, à tierra.

Desembarcan, y desaparece la Nave.

Homb. Humanos sentidos mios,
vassallos, que componeis
la Republica del Hombre,
que mundo pequeño es.
Generoso Entendimiento,
Piloto de esse Baxél,
que sobre el campo del mar
monstruo se alimenta, pues
quanto bate el viento es ave,
quanto baña el agua es pez.
Compañeros de mi vida,
dexad el mar, no porque
nuestra peregrinacion
en la tierra, que aora veis,
aya de cessar, supuesto
que siempre tengo de ser
yo Peregrino del Mar,
y de la Tierra tambien:
dexad siada essa Nave
à la discrecion cruel
de un embate, y otro embate,
de un baybèn, y otro baybèn.
Seguramente amarrada
con las Ancoras estè,
que de quien Piloto ha sido
el Entendimiento, aunque

17 The metre changes here to one which is seldom found in Calderon's secular dramas, but frequently in the Autos. It is a *single* asonante vowel rhyme in the last syllable of each alternate line, which, as in the more usual *double* asonantes, is kept up through the entire scene. It appears to be the oldest form of the asonante, being found in the earliest primitive ballads,

Peaks of tall hills, which touch the azure air,
Now mocking the far wave-war on the strand.

Underst. Now the clouds part—it is the land, the land!

Man. O prudent pilot Understanding!

Thou who hast been so long commanding
This bark of human life, this boat,
That at the self same time can fly or float,
Being upon the foam flakes it rests on,
A scaleless dolphin, and a plumeless swan,
Beneath you mountain turn its prow,
Beneath you peak which on its brow
Wears a star of brightest ray—

That point whose light is filched even from the God of Day—
There where it seems to stretch a curved hand
To clasp this human bark.

All. To land! to land!

All disembark and the vessel disappears.

Man. Human Senses mine, my vassals,
Who together all compose¹⁷
Man's Republic, he a little
World himself, as all do know.
Generous Understanding, thou
Pilot of this mystic boat,
Changeful monster, pasturing well
Over the sea-way, swift or slow,—
Being a bird when winds it played with,
Being a fish when seas washed o'er.
Ye, companions of my life,
Leave the sea, but not therefor
Think that our long wandering ceases
In the land that you behold—
Since still moving onward ever
Must my fate be, I suppose—
Over the earth to move a pilgrim—
Over the sea likewise to go:—
Leave this bark a while entrusted
To the cruel care and cold
Of waves dashing wildly together,
Of foam writhing in hostile foam,
But let anchors firm and strong
Safely still the vessel hold,
For the Pilot Understanding,
Though he leaves her for the shore,

such as that of *Virgilios*, of *Count Arnaldos*, of *The Infanta of France*, etc. (See Duran's *Romancero General*. Madrid, 1849, t. 1, p. 151). In the original of this scene, the vowel used is *e*, which is an effective one in Spanish: for this, which is comparatively weak in English, I have substituted the stronger *o*.

aore le dexe, quizà
le avrè menester despues :
y entremos à examinar
estos montes, que han de ser
Puerto de nuestra fortuna.

Gust. Què tierra es esta?

Tact. No sé;
mas quiera el Cielo que sea
Tiro, para que aya en èl
olandas, sedas, y ropas,
donde regalado estè
mi tacto.

Olfat. Mejor no fuera,
que fuera à tanta altivèz
la gran India de Sabà,
donde huviera para oler
yo, suavissimas Aromas?

Oïdo. Ninguno ha pedido bien,
pedid la India Oriental,
porque habitan su vergèl
dulces Aves, cuyos cantos
sonora musica dèn,
que regalen mis oïdos.

Vista. Necios sois, pues no quereis
que sea Tiro, y que aya aqui
oro, y diamantes, en que
mi vista halle mas reflexos,
que el Sol en su rosicler?

Gusto. Mal aveis deseado todos
en no desear, y creer,
que sea la Tierra de Egypto
essa tierra, para que
en ella hallèmos las ollas,
que en ella dèxo Moysés,
pues no ay en el Mundo gusto
sin comer, y sin beber.

Ent. Què como humanos sentidos
todos deseado aveis
hallar cada uno el objeto,
que mas conviene à su sér!
No fuera mejor que fuera
la tosca Tebayda, en quien
la penitencia se hallàra,
riyendose del poder
de las Cortes populosas,

May perchance again require her:—
Let us enter now, and go
Curious through these hills which
Heaven

Gives our fortunes as their port.

Taste. What land 's this?

Touch. I cannot say.
Heaven but grant 't is Tyre: if so
I shall find abundant here—
Silks, fine linen, purple robes,
Things my touch delights to feel.

Smell. Were it not better then to hope
That 't will prove some Arab plain—
Some Sabœan scented shore
Where the sweetest odours may
Glad the happier sense I own?—

Hearing. No one yet has wished aright:
Wish the land through which we
roam

May be beauteous eastern Ind,
In whose vocal bowers and groves
Sweet birds' songs may fill my ears
With melodious music tones.

Sight. Idle are your wishes all,
Since you wish not for the zone
Where the diamonds glisten bright
And the land is rich with gold:
Sweeter to the sight are gems
Than the morn on roses throned.

Taste. Badly have you all desired
In not wishing this alone,—
That this land should prove to be
Egypt's comfortable coast, [pots
Where perchance we'll find the flesh-
Left by Moses long ago,
Since the world hath little better
Than good drink and meat to show.

Underst. Human Senses, oh! how each,
Each and all are prompt and prone
To desire this land may offer
What its instinct longs for most!
Were it not better that it prove
The Thebais wild and lone,
Deserts where pale Penance may
Trample down the pride of courts?—
Since there 's nought more sure than
this—



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Ent. Essa ingratitude le pienso
quitar yo, que a queste fue
del Entendimiento oficio.

Homb. Mi gusto os ha dicho bien :
sentidos, seguid al Gusto,
y no arguyais mas con èl,
sino esta tierra à que avemos
llegado, à reconocer
entrad. Pues eres la Vista,
delante de todos vè,
mira si acaso descubres
poblacion. Tù, que eres fiel,
Oído, mira si oyes
voces, que noticia dèn
de gente, ò ganado. Tù,
del suavissimo placer
con que essas flores respíran
el rastro sigue con èl.
Mira si puedes topar
algun blando lecho en quien
descanse. Y tù, Gusto, al sin,
mira si hallas que comer,
y tódos buscad delicias
para mì.

Entend. Aunque desee,
que halles, penitencia, yendo
à esso, la Culpa hallaréis.

Vist. Yo verè si ay poblacion. *Vase.*

Homb. Y yo me quedo sin vèr.

Oid. Yo escucharé si oygo voces.

Homb. Yo, ausente tù, nada oiré.

Tact. Yo, si ay lecho en quien des-
canses.

Homb. Yà yo no le he menester.

Olfat. Yo, si hallo blandos aromas.

Homb. Yà no tienes para què.

Gust. Yo, si hallo dulces manjares.

Underst. Be it mine, O Man, to free
thee

From ingratitude so low,—

'T is thy Understanding's duty.

Man. Taste, thy words are wise and
bold :—

Follow Taste, my Senses all,

And with *him* dispute no more,—

But this land to reconnoitre,

On whose bosom we are thrown,

Enter now : Since thou, O Sight,

Seest many a mile before,

Look if thou, by any chance,

Canst the dwellers here behold.—

Hearing, thou my faithful friend,

List if thou canst catch the tones

Of human voices borne afar,

Or the pasturing herd's deep low.—

Thou whose rapture rises sweet

From each scented flower that blows,

Follow too the track with them :—

Some soft bed for my repose

Thou by gentle pressure find,—

And the task, O Taste, I'll throw

Upon thee of finding food.

All on separate missions go,

Seeking sweet delights for me.

Underst. By another path I hoped

Thou wouldst Penance find: pursu-
ing

That, thou 'lt find Sin's syren door.

Sight. I depart to look for people.

[*Exit.*

Man. Blind I stay, since Sight hath
flown.

Hearing. I to list if sounds can reach
me. [*Exit.*

Man. Since thou 'rt gone, I hear no
more.

Touch. I a bed in which to rest thee.
[*Exit.*

Man. None I need now for repose.

Smell. I to search for herbs of fra-
grance.

Man. There is none their sweets to
know.

Taste. I sweet savoury food to seek
for. [*Exit.*

Homb. Ahora no quiero comer,
 porque mientras vais vosotros
 el Mundo à reconocer,
 al pie de este Cyprès quedo
Echase al pie de un Cyprès.
 echado à dormir.

Entend. Què bien,
 para dormir, los sentidos
 apartas de ti; pues es
 cierto, que queda sin ellos
 el que duerme: y què bien fue
 Cyprès el Arbol, que aqui
 tomaste para ti, pues
 viene à ser Arbol de muerte,
 de quien el sueño tambien
 es sombra; y aunque dorados
 los ricos Catres estèn,
 en que descansan los hombres,
 desde el mendigo, hasta el Rey,
 aunque sean de otras maderas,
 son Arboles de Cyprès.
 Quedò el hombre sin sentido,
 y durmiò; yá què he de hacer?
 Que aunque potencia del alma
 soy, y ella, que mortal no es,
 dormir no puede, este tiempo
 que yáze el hombre, tambien
 estoy yo sin discurrir,
 sin percibir, ni entender.
 Vaga mi imaginacion
 confusas visiones vè;
 y todo es tiniebla, y sombras
 para mi el Mundo, porque
 sin los sentidos no puedo
 actos de rason hacer:
 seguirèlos, pues sin mi
 se queda el hombre la vez
 que duerme, y que sepultado
 temporal cadaver es. *Vase.*

Homb. Ay de mi! pesado sueño,
 no tanto me aflijas, ten
 la violencia de las sombras.
 Què es lo que mis ojos vèn
 sin vista? Mas digo mal,
 que mis sentidos cobrè;
 si bien informes, y brutos,

Man. Now the thoughts of food I
 loathe.

Wherefore, whilst you all are gone
 To explore this land unknown,
 I, in sleep, this weary body
 At this cypress' foot shall throw.—

[*He lies down.*

Underst. Yes; 't is right that thou
 shouldst sleep,

Since apart from thee, there prone,
 Are thy Senses; for 't is certain
 That the man who sleeps doth hold
 Them no longer in his keeping:
 And the tree thou sleep'st below,
 Rightly hath thy choice selected,
 Since the cypress long hath grown
 Death's especial tree; and sleep
 Is death's shadow as we know.—

Thus though weary man may slumber
 In rich couches gilded o'er,
 Call the wood of which they're made
 What you please, to king and clown
 Cypress is it all the while.—

Here then Man, by sleep o'erthrown,
 Lies insensate: This being so,
 What remains for me to do?

Since although I am the soul's
 Manifested power, and *that*
 Deathless spark no sleep can know,
 Still while man thus lies, am I
 Likewise left without discourse
 Powerless to perceive or think.

Now my fantasy beholds
 Visions all confused and dim,
 Darkness o'er the world is thrown,
 Since without the Senses, I
 Lose all reason and control:

I shall follow them, since Man,
 While his eyes in sleep are closed,
 Without *me* remains, and buried
 Thus, is for the while a corse. [*Exit.*

Man (asleep). Woe is me! oppressive
 dream,

Pain me not so much! withhold
 These thy shadows' violent rage.
 What is this my eyes behold,
 Though my sight is gone?—Ah me!
 Badly must my thoughts be told

en el punto que lleguè
 á vèr estos fieros monstruos,
 que me quieren deshacer;
 me pasma advertir, que quando
 esperaba, que cruel
 cada uno cebasse en mí,
 todos se echan à mis pies;
 por señas dicen, que huya,
 que los quiero conocer
 parece; desesperados
 se entran al Monte otra vez.
 Què es esto, Cielos!

*Al irse sale el Entendimiento como
 assombrado.*

Entend. Escucha,
 Ulises, yo lo dirè,
 que aunque estàs aora incapáz
 de sentir, tocar, y vèr,
 porque brutos tus sentidos,
 y entorpecidos se vèn,
 por los vicios, à que tú
 los diste licencia; bien
 me entiendes: mas los del alma
 fuerza es que velando estèn.
 Apenas fuimos, Ulises,
 vagando aqweste Horizonte
 tus compañeros, del Monte
 penetrando los Países,
 quando un Palacio eminente
 nuestra vista descubriò,
 cuya eminencia tocò
 á las nubes con la frente.
 Llegamos à sus umbrales,
 y aviendo llegado à ellos,
 en dos Esquadrones bellos
 de hermosuras celestiales,
 vimos salirnos à hacer
 fiestas á nuestra fortuna,
 con varias musicas una
 hermosissima muger.
 De passo la repetì

'Till my senses I recover.—
 But I seem to see a swarm
 Of misshapen beasts approach me,
 Bent on draining my heart's gore.
 When their cruel fangs, my fear
 Seems to fasten round my throat,
 At my feet I see them kneeling
 With submissive reverence low:
 They by signs appear to say
 Fly! oh! fly this fatal shore.
 Then when they perceive that I
 This their hidden meaning know,
 In despair they all reënter
 The wild mountain wastes once more.
 What is this? O Heavens!

*As he starts up, the Understanding enters
 amazed.*

Underst. Ulysses,
 Hear me, and thou soon art told.
 For although thou hast not now
 Power to see, or feel, or hold,
 Since thy Senses have become
 Torpid, brutalised, o'erthrown
 By the vices that thou gav'st them
 Leave to seek, yet still I know
 Thou canst understand my meaning
 Through the soul's instinctive force.¹⁹
 Scarce had we, Ulysses, gone
 This wild mountain's summit over,
 Hope, some fair fields to discover,
 Thy companions leading on,
 When our sight beheld with wonder
 A proud palace rich and fair,
 For whose lofty roofs the air
 Bade the gold clouds part asunder.
 We its beauteous thresholds nearing,
 Reached them, and beheld, delighted,
 Two fair squadrons disunited
 Of celestial nymphs appearing,
 And with smiling looks of human
 Sympathy for our distresses—
 Music mingling its caresses—
 After them one beauteous woman.
 Of our perils on the sea,

¹⁹ The alternate vowel monorhymes terminate here, and the metre changes to the full consonant rhyme as in the text.



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probarlo no es menèster ;
 porque bien se dexa vèr,
 que el Gusto á la Gula amó.
 La Lisonja, mortal fiera
 de las Cortes, al Oïdo
 brindò, que èl objeto ha sido
 de toda voz lisonjera.
 La Sobervia, con intento
 de que el veneno que esconde
 passasse à mi, porque es donde
 peligra el Entendimiento,
 me brindò ; mas sin el fruto,
 que de mi estaba esperando,
 por saber yo, que en pecando
 se convierte el hombre en bruto.
 David lo diga, que atento
 este sentir en èl hallo,
 que el que peca es un cavallo,
 en quien no ay entendimiento.
 Y fue assi, que como fueron
 bebiendo, todos mudados
 en fieras, y transformados
 en varias formas se vieron.
 Mas atencion desde aqui,
 hombre, te pide mi acento ;
 escucha à tu entendimiento,
 que es el que te habla.

Homb. Di.

Ent. La Vista, en Tigre cruel
 fue de la Embidia despojos,
 que este animal todo es ojos,
 bien lo publica su piel
 manchada de ellos ; y quando
 no baste esto, bastarà,
 que el Tigre muerte se dà,
 si oye musica, rabiando.
 Y el embidioso, en sus penas
 se dá muerte cada dia,
 si oye la dulce harmonia
 que hacen las dichas agenas.
 El Tacto, que fue el objeto
 que à la Lascivia creyò,
 en Osso se convirtiò,
 que este animal, imperfecto.
 sin forma, y sin ojos nace :
 y el Apetito, à creer llego,

Gluttony the Taste allured,
 Little proof this needs from me,
 Since that Taste loves Gluttony
 All the world is well assured.
 Flattery was Hearing's choice,—
 Flattery, that mortal pest,
 Known to courts, where he 's the quest
 Of each false and flattering voice.
 Pride, with full intent that I
 Should her hidden poison drink
 (Understanding, Danger's brink
 Neareth, when that nymph is nigh),
 Came and pledged me, but the fruit
 Hoped for so, she failed in winning,
 Since I know that Man, by sinning
 Is transmuted to a brute.
 David's song the sinner tells,
 If in sin persisteth he,
 Comes a beast of earth to be,
 In whose soul no reason dwells.
 Thus it was, as each, the bowl
 Drank, of poisoned bliss, deranged
 Quick to grovelling beasts they
 changed,
 Reft of sense, of shape, of soul.
 Thy attention, O thou weak
 Man! my voice is still demanding,
 Listen to thy Understanding,
 Who doth speak to thee:—

Man.

Still speak.

Underst. Sight, a tiger fierce did grow.
 He, the keen-eyed Envy's prize,
 Since an animal all eyes,
 As its spotted skin doth show,
 Is the tiger, and we may
 This additional reason add,
 That the tiger dieth mad,
 If he hears sweet music play.
 Thus the envious man doth feel
 Every day the pangs of death,
 If he heareth rumour's breath
 Sweetly speak another's weal.
 Touch, that soon became the thrall
 Of Desire's lascivious air,
 Was transformed into a bear—
 An imperfect animal,
 At its birth unformed and blind—
 As is Appetite, that makes,

que nace sin forma, y ciego,
 pues tantos errores hace.
 El Gusto (gloton hambriento)
 en un bruto inmundo fue
 transformado; esto porque
 solo à su comida atento
 vive, sin que de su pecho
 el hombre servicio adquiera,
 pues ha menester que muera
 para serle de provecho.
 El Olfato, que entregado
 se viò à la murmuracion,
 se convirtiò en un Leon,
 que es quien rugidos ha dado.
 Y finalmente, el Oïdo,
 que falsedades creyò
 lisonjeras, se mirò
 en Camaleon convertido:
 y el bruto, que vivir quiere
 del viento solo fiado,
 es el mas vivo traslado
 de la lisonja en que muere.

Homb. Docto Entendimiento mio
 en gran peligro me veo,
 à mis sentidos deseo
 rescatar con mi alvedrio,
 para vivir, pues que yo
 no puedo de aqui ausentarme,
 que no tengo de dexarme
 compañeros, que me diò
 mi misma naturaleza.
 Y supuesto que perdidos
 todos mis cinco sentidos
 estàn en esta aspereza
 de la culpa, entrar intento
 à libertarlos, porque
 bien de la empresa saldrè,
 si voy con mi Entendimiento.

Ent. Pues que conmigo has de ir
 à cobrarlos, ha de ser
 con tres cosas que has de hacer.
 Primeramente, pedir
 al Cielo perdon de que
 tan mal los aconsejaste,
 que al riesgo los entregaste.
 Otra, confessar que fue
 tuya la culpa que ha avido,
 aunque ellos fueron, Ulises,

Therefore, all its dread mistakes
 Sightless, formless, undefined.
 Taste, the hungry glutton, grew
 Easily a filthy swine—
 It a beast that doth incline
 But to eat and eat anew,—
 Long delaying to conduce
 To man's benefit thereby,
 Since 't is needful he must die
 Ere he turns to any use.
 Calumny, that had thrown out
 Lures to Smell, converted him
 Into a lion, gaunt and grim,
 Who, loud, roaring, roams about.
 Lastly, Hearing, that had grown
 But to live on what it heard,
 Trusting every idle word,
 Changed to a chameleon;
 Since the being that but needs
 For its life the air, be sure
 Is a lively portraiture
 Of the sense that Flattery feeds.

Man. O my guide in every ill!
 'Mid the risks that round me hover,
 I my Senses would recover
 By the ransom of my will,
 If 't were but to live, since I
 Have no power by flight to save me,
 If all those whom Nature gave me
 As companions, forth not fly
 With me from this fatal coast.
 And supposing that within
 This enchanted world of Sin
 My five Senses may be lost,
 Still I'll enter, notwithstanding,
 Them to free, because I know
 I to victory must go,
 Going with my Understanding.

Underst. Since then to this dangerous
 task
 Led by me, you mean to run,
 There are three things to be done.
 In the first place you must ask
 Heaven to pardon the express
 Sanction and unwise advice
 Given by you, that they to Vice
 Should entrust them: next confess
 That the fault was thine that cast

los que entregarse quisieron.

Y otra, averse arrepentido.

Homb. Digo, que pido perdon
del mal exemplo, (ay de mi!)
que à mis sentidos les di:
digo, que hago confession
de la culpa que he tenido
de que se ayan entregado
à las manos del pecado,
y que voy arrepentido.

*Tocan Chirimias, y descubrese un Arco
Iris en un Carro, y en èl la Peni-
tencia, y canta la Musica.*

Music. Yà que el hombre confiesa
su culpa,
y arrepentido me pide perdon,
(ò Penitencia!) pues eres el Iris,
acude bolando à darle favor.

Penit. Yà corro veloz
en el arco de Paz, en quien haces
las amistades del hombre, y de Dios.

Homb. Què musica tan sonora
es la que oimos los dos?

Ent. Auxilio es que te dà Dios.

Homb. Y aquel bello Arco, que aora
sobre las nubes se assienta?

Ent. Arco es, que la Paz abona,
y que yà cessò pregona
el rigor de la tormenta.
Dios le puso por señal
de Paz entre si, y el hombre,
y assi el verle no te assombre.

Homb. Y la Ninfa Celestial,
quièn es, que saberlo espero?

Ent. La Iris, Embaxatriz
mas sollicita, y feliz
del Jupiter verdadero,
la que à los hombres embia
à consolar su dolencia.

Homb. Pues quièn es?

Ent. La Penitencia;

Them into the snares of Sin,

They not loath to enter in,—

Let repentance be the last.

Man. I declare, for such transgression,
For the bad example given
To my Senses, I ask Heaven
To forgive me: next, confession
For the fault, by whose event
Into Sin's foul hands they fell
I declare aloud as well:
And that truly I repent.

*There is a peal of clarions, and a Rain-
bow is discovered in a Chariot, and in
it is Penance, and Music sings.*

Music. Now that man his sinful fault
confesses,
And repenting asks to be forgiven,
Fly, O Penance! fly, celestial Iris,
Grace to grant him once again from
Heaven.

Penance. Yes, adown the sky;
On the arch of Peace I fly—
On the arch whose mystic span
Amity proclaims 'twixt God and Man.

Man. Ah! that music so sonorous
Which we hear, what may it be?—

Underst. God's assistance aiding thee.

Man. And that beauteous Bow, that
o'er us

Rests on clouds its radiant form?

Underst. Is the Bow that bringeth
Peace—

Is the Bow that maketh cease

All the rigour of the storm.

God has placed it as a sign—

Peaceful sign—'twixt Him and thee;

Therefore, Man, rejoice and see.

Man. And the Heavenly nymph divine,
Who is she? oh! make her known!

Underst. Iris, the Embassadress,
Who with happy haste doth press
Downward from the true Jove's
throne,

Bears her hither, to console

Man in all his misery.

Man. And her name?—

Underst. Is Penance: see



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las amistades del hombre, y de Dios.

On the arch of Peace I fly,
On the arch whose mystic span
Amity proclaims 'twixt God and Man

Tocan Chirimías, y desaparece el Arco.

*While the clarions play, the Rainbow
and Penance disappear.*

Homb. Iris bello, hermosa Ninfa,
no desvanezcas tan presto
tanta multitud de Estrellas,
tanta copia de Luzeros.

Man. Beauteous Iris, lovely nymph,
Do not hide in such swift darkness
Such a host of starry splendours—
Such a crowd of meteor flashes.

Ent. Rayo de Luz, que has corrido
por las Campanas del viento,
señal de Paz, que à Moysès
Dios señalò en el Desierto :

Underst. Ray of light, that through
the wind-swept
Plains of azure Heaven hath darted—
Sign of peace, which in the desert
God to Moses indicated—

Homb. Tente, aguarda.

Man. Stay! detain thee!

Ent. Escucha, espera.

Underst. Listen! wait!

Homb. Fuese, dexandome impresso
un renglon de tres colores
en el Papel de los Cielos.
Ay Entendimiento mio,
dichoso soy, pues que tengo
con que vencer los encantos
de esta Circe!

Man. She is gone, but in her passage
Leaving me a line of greeting
Writ in triple-hued enamel,
On the sky's cerulean paper,—
Understanding mine, how happy
Am I in a power possessing
Of subduing the enchantments
Of this Circe!

Ent. Alza del suelo
essas flores.

Underst. From the ground
Raise the flowers.

Homb. Ay de mi!

Man (in doing so). Oh!

Ent. Què sientes?

Underst. What smarts thee?

Homb. Herirme siento
con sus espinas.

Man. By the sharp thorns round these
roses

Alza las flores.

I am wounded.

Entend. Las flores
de la penitencia, es cierto
que asperas son al principio,
quanto son fragrantés luego.

Underst. Yes; the sharpness
Of the penitential flowers,
Is the first thing felt, but after,
Nought but their delicious fragrance.

Homb. Espinas de mi pecado,
con temor á alzaros llego.
Vamos, que aunque mis sentidos
estén cautivos, y presos
de su bellissimo encanto,
assi libertad pretendo.

Man. Ah! with fear I stoop to handle
Ye, the sharp thorns of my sin.
Let us on! for though this fastness
Keeps my captive Senses chained,
Spell-bound by such sweet enchant-
ment,—

Still I hope to liberate them.

Entend. No tienes que ir á buscarla,
que ella á buscarte à este puesto

Underst. Then to meet with the en-
chantress,

Thou no farther needst to go,
Since to meet thee she advances.

ha salido, con las voces
de musicas, è Instrumentos.

*Salen la Lascivia, y la Culpa detrás
de todos, y traen una Salvilla, un
Vaso de plata, y otra una Toalla al
hombro.*

Music. En hora dichosa venga
á estos Jardines amenos
el Peregrino del Mar,
donde halle seguro Puerto.

Culp. En hora dichosa venga,
digan los dulces acentos,
una, y mil veces, sin que
nada les usurpe el eco,
Vandolero de los Ayres,
que se queda con los medios.
En hora dichosa venga
el hombre, que por sus hechos
es assunto de la fama
por su valor, y su ingenio,
donde tengan sus fortunas
dulce Patria, amado centro,
noble asylo, illustre amparo,
blando albergue, y feliz Puerto.
Apenas supe, inconstante
huesped de dos Elementos,
que sobre tribulaciones
baten las olas, surgiendo
yá los embates del Mar,
yá las rafagas del Viento.
Apenas supe, Señor,
oy de vuestros compañeros,
(á quien yá en Palacios mios
bien agassajados tengo)
que erais el valiente Ulises,
que quiere decir en Griego
hombre ingenioso (que al fin
no ay sin, cautelas ingenio)
que de la Troya del Mundo
huyendo venís al fuego,
à quien vos mismo en vos mismo
alimentais en incendios,
quando à recibiros salgo
con todo esse Coro bello
de mis damas, celebrando
tan noble recibimiento.
Llegad todas à sus plantas,

See, she comes with songs and music,
And her syren train, to charm thee !

*Enter Sin, followed by Voluptuousness,
Flattery, and others. Voluptuousness
bears a salver, on which is a silver
goblet, and Flattery a napkin.*

Music. Happy, happy, be the hour
That to these delicious gardens
Comes the pilgrim of the sea,
In a safe port happily landed.

Sin. Happy be the hour he cometh !
Once a thousand times repeat it ;
So that Echo, the freehanded
Robber of the air, may filch not
From the sound his usual largess.
Happy be the hour that cometh
Here the man to whom is granted,
For his wit and worth in warfare,
Fame the proudest and the amplest :
Here, wherein a home and country
Now his happier fate imparteth,—
A proud shelter—a high safeguard—
A soft rest—a happy haven.
Scarcely had I heard, O ever
Changeful guest of air and water,
Of two elements the victor,
Since on troublous billows wafted,
Now the rude sea's rage thou curbest—
Now the wild wind's mightier mad-
ness :—

Scarcely had I heard, my lord,
From thy comrades, whom my palace
Entertaineth now and welcomes
In obedience to my mandate,—
That thou wert the brave Ulysses,
Which doth mean in Grecian par-
lance,

An astute-soul'd man (astuteness
Being, as 't were, a twin with talent),
Who from flaming Troy escaping,
Hither to a fire hast wander'd,
Which within thyself thou feedest,
From internal quenchless ashes,—
When I hurried to receive thee
With this beauteous choir of damsels
Celebrating with due honour
Such a noble stranger's advent.

y con corteses festejos
le saludad; y porque
el que en el Mar tanto tiempo
fluctuò golfos de penas
en pielagos de tormentos,
es la sed la que le aflige;
mas à quièn no admira esto,
que siendo el Mar todo agua,
tenga á su huesped sediento?
Brindadle con esse Nectar,
que está de dulzuras lleno,
en tanto que en mis Palacios
mas regalos le prevengo.

Lasc. Bebe, Señor, el sabroso
licor que yo te presento.

Ent. Ay de tí, si le bebieres,
que todo es lascivo fuego!
Què haces?

Homb. Para resistirme
conmigo mesmo peleo.

Ent. No le bebas, yà no sabes
que es tosigo, y es veneno?

Homb. Sì, Entendimiento, y tu aviso
ha llegado à muy buen tiempo.
Estoy cobarde, estoy mudo,
tanto al cortés cumplimiento,
que debo à vuestra beldad,
y à vuestra hermosura debo;
que aunque retorico fui,
al miraros enmudezco:
en fé de lo qual, el nectar
con que me brindais acepto;
mas por no ser descortes
harè la salva primero
con estas flores, que no
se atreven à ser grosseros
tanto mis labios, que lleguen
sin aquesse cumplimiento.

*Toca el Vaso en el Ramillete, y sale
Fuego.*

Lasc. Ay de mì! El Fuego que avia

At his feet then lowly kneeling,
Welcome in the costliest manner
His arrival, and, because
He who in the sea has tarried
Such a length of time, exchanging
Gulfs of gloom for waves of saltness,
Was by thirst afflicted mostly—
Strange, the sea, which is all water,
That it should its guests leave thirsty,
And the liquid store so ample!—
Pledge him with this honeyed nectar
Sweetened by celestial savours,
While within my palace yonder
Are prepared more festive banquets.

Volupt. Drink, my lord, the sweetly
savour'd

Liquor, which I dare to hand thee.

Underst. Woe to thee, if thou dost
drink it!

Liquid lust-fire fills that chalice!
What then wilt thou do?

Man. I struggle
With myself in self-fought battle!—

Underst. Drink it not: the draught
concealeth

Poison deadlier than the adder.

Man. Yes, my Understanding, yes:
[*aside.*

Timely comethy words to warn me:—
I am timid, I am mute, [To Sin.
Thinking of the courteous favour
Which I owe to thy perfections,
Which I owe thy beauty, lady.
For though skilled in speech were I,
Dumb I'd grow in gazing at thee:—
Therefore I thy proffer'd nectar
Take, and thus by taking thank thee.
But that I may not be wholly
Wanting in more courteous manner,
I shall first salute and touch it
With these flowers, the grosser ad-
vent

Of my lips presuming only
Such sweet tribute to come after.

*He dips the nosegay in the goblet from
which fire issues.*

Volupt. Woe is me! the secret fire



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que diò tu arrepentimiento,
no tengo yo poder, no,
para guardarlos mas tiempo.
Oïdo, que oïste lisonjas,
que tu dulce encanto fueron,
por quien te tuvo trocado
en Camaleon tu afecto.

Sale el Oïdo como assombrado.

Oïdo. De què letargo tan dulce
à esta nueva voz despierto?

Culp. Olfato murmurador
de lo malo, y de lo bueno,
que fuiste Leon, que diste
dañado olor con tu aliento.

Sale el Olfato assombrado.

Olfat. O nunca yo despertara
de tan regalado sueño!

Culp. Tacto, que lascivamente
empleado en tus deseos
Osso fuiste, pues que nace
sin forma, sin vista, y cuerpo.

Sale el Tacto assombrado.

Tacto. Què à mi pesar me levanto
de tan regalado lecho!

Culp. Vista, que manchado Tigre
has pacido este Desierto,
pues envidioso eres ojos
que sientes bienes agenos.

Sale la Vista como assombrado.

Vist. Si noche han de ser los mios,
de què sirve lo que veo?

Culp. Gusto, que animal inmundo
eres, porque siempre hambriento
solo en esta vida cuidas
de sustentarte à ti mesmo.

Sale el Gusto assombrado.

Gust. Que era un gran puerco soñaba,
nadie que ay que creer en sueños
diga, ò si diga, pues oy
lo soy dormido, y despierto.

That thy penitence hath arm'd thee
So with virtues, I no longer
Have the strength or power to guard
them.—

Hearing! thou to whom light words
Were a source of sweet enchantment,
On account of which defect
A chameleon's shape I gave thee.

Enter Hearing amazed.

Hearing. Ah! from such sweet lethargy
Must I at this new voice waken?

Sin. Smell! that libellest in turn
Equally all forms of matter,
Thou a lion late, whose breath
Fetid odours round thee scatter'd.

Enter Smell amazed.

Smell. Ah! that I had never woken
From a sleep by dreams so glad-
den'd!—

Sin. Touch! that, by thy low desires
Wholly occupied and trammel'd,
Wert a bear, since it is born
Sightless, formless, and unshapen!

Enter Touch amazed.

Touch. Oh! the sorrow! to arise
From a bed so softly padded!—

Sin. Sight! that in these deserts here
Livest like a spotted panther,
Fleck'd with envious eyes to see
Aught of alien good that happens.

Enter Sight amazed.

Sight. Of what service are mine eyes,
If I'm doomed to dwell in darkness?—

Sin. Taste! that art a beast unclean,
Since with hunger never sated,
The sole thought of thy existence
Is how best to feed and fatten—

Enter Taste amazed.

Taste. What a hog I dreamed I was!
Dreams are fables though, what mat-
ter?

Waking or asleep by me
Is the self-same part enacted.

- Culp.* Yà estàn aqui tus sentidos,
yà à tu poder te los vuelvo.
Idos, que en mì no durais
sino solamente el tiempo
que tarda en venir el hombre
por vosotros ; pues es cierto,
que està en su mano el cobraros,
como en su mano el perderos.
- Ent.* No esperas mas, vèn à este
Baxèl de tu Entendimiento.
- Oïd.* Dònde hemos de ir tan apriessa?
Apenas llegado avemos
à estos Palacios, y yà
nos quieres ausentar de ellos?
- Vist.* Adònde quieres llevarnos
por esse Mar padeciendo?
- Olfat.* Dexa que de las passadas
fortunas nos reparemos.
- Gust.* Dexame, Señor, que sea
puerco otro poco de tiempo,
pues no ay mas seguridad
en el Mundo, que ser puerco.
- Ent.* En fin, sois brutos, sentidos,
tan brutos, que holgais de serlo.
- Gust.* No sabemos quan bueno es
estàr comiendo, y gruñendo?
- Ent.* Vamos, què esperes, Ulises?
- Homb.* Vamos, pero no tan presto,
porque de aver visto aqui
mis sentidos mal contentos
de dexar estas delicias,
no sé (ay de mì!) lo que siento.
- Ent.* Yo te llevaré por fuerza.
- Homb.* No haràs tal, que tu consejo
arrastrarme no podrà,
moverme sì, yà lo has hecho:
vè à prevenir el Baxèl,
pues Piloto eres.
- Ent.* Yà vuelvo.
- Vase.*
- Homb.* Por poder mas libremente
vèr esta Deidad, le ausento .
- Sin.* See, thy Senses all are here :
Back into thy power I hand them.—
Go ! your stay with *me* endured
Only for the time your master,
Man, delayed to come and claim you,
Since 't is certain power is granted
Not alone to Man to lose you,
But to regain you when you're absent.
- Underst.* Stay no longer here, but come
To my bark in which we landed.—
- Hearing.* Whither should we go so
quickly ?
Scarce have we the beauteous gardens
Of this friendly palace entered,
And already we're debarred them.
- Sight.* Wouldst thou bring us back to
sea,
There to suffer new disasters ?
- Smell.* Let us here recruit our strength
After all the ills we've master'd.
- Taste.* Let me be a hog, I pray,
Once again, good sir, I ask thee,
Since of all the lives I know,
Is a hog's life the most happy.
- Underst.* Ah ! so brutish are the Senses,
To be brutes appears to glad them !
- Taste.* Have we not found out how
pleasant
'T is to eat and grunt untrammell'd ?
- Underst.* Come Ulysses, why delay ?
- Man.* Let us go,—but still there's
ample
Time to spare, for since I see
How my senses are distracted
At abandoning these pleasures,
Ah ! I know not how I falter.
- Underst.* I must drag you hence by
force.
- Man.* Ah ! by force you cannot drag
me,
But by counsel you may lead :
Even already you attract me :
Go, prepare the bark, for you
Are the pilot.—
- Underst.* Yes, with gladness
To return here. [Exit.
- Man* [aside]. That this goddess
I may see with freer glances,

de mi a queste breve instante
sin temor de sus preceptos.

Culp. Aora podrè hablarle, pues
apartò su entendimiento.

Ya Ulises, que victorioso
te miras de mi, bolviendo
de essas incultas Montañas
coronado de trofeos,
no tan presto al Mar entregues te
en esse inconstante leño,
que el Mar da la Vida surca,
amenazado de riesgos.

Mira alterados los Mares,
que con veloz movimiento
en pyramides de espumas,
son Alcazares de hielo.

Dexa que el Mar se serene ;
y pues te miras exempto
de la Magia de mi encanto,
en fé de esse ramo bello,
que te diò la Iris, no quieras
bolverte al afán tan presto :
descansa en mi albergue oy,
que mañana serà tiempo
para dexar estos Montes
de tantas delicias llenos.

Què priessa te corre aora
de ausentarte ; y mas sabiendo,
que yo, cada vez que quieras
ir, detenerte no puedo ?

Entra en mis ricos Palacios,
donde son divertimientos
todas sus ocupaciones
para el aplicado Ingenio.

Veràs mis grandes Estudios,
mis admirables portentos
examinaras, tocando
de mi Ciencia los efectos.
Por què piensas que me llaman
la Circe de estos Desiertos ?
Porque Ciencias prohibidas,
que son Leyes que yo tengo,
con mis estudios alcanzo,
con mis vigiliyas aprendo.

Veràs apagado el Sol,
solo à un soplo de mi aliento ;
pues en la luciente edad,
el dia yo le obscurezco :

Undeterred by his suggestions,
I have thus contrived his absence.—

Sin [aside]. I can tempt him now,
since his

Understanding hath departed.—
O Ulysses ! crowned with trophies,
Vanquisher of my enchantments,
Flying from this lonely island,
From its mountains and morasses,
Do not trust thyself so quickly
To the wild and dangerous vastness
Of the sea of life, to plough it
In a frail bark so unstable.

See ! its mighty breast upheaving
In its rapid movement sparkles
Now as pyramids of crystal,
Now as snow-embattled castles.
Wait the wild turmoil's abating,
Wait until the sea grows calmer ;
And since thou hast been exempted
From the spell of my enchantment
By the gift that Iris gave thee,—
By that budding beauteous branch-
let,—

Oh ! return not back so quickly
To its dangers and disasters :
Rest thee in my house to-day :
In the morning will be ample
Time for thee to fly these mountains
And these joy-enfolding gardens.
Why so swiftly fly for safety,
Knowing well thou art so guarded,
That whenever thou wouldst leave me
I am powerless to withstand thee ?—
Enter then my dazzling palace,
Where an intellectual banquet,
Graced by gladness and enjoyment,
Waits upon thy welcome advent.
Thou wilt see my deep researches,—
Thou my wonders wilt examine,—
All the secrets of my science
Will be bared to give thee answer.
Wherefore, thinkest thou, the Circe
Of these desert wastes, they call me ?
'T is because forbidden knowledge
(*That sole law I leave untrampled*)
I, by application, reach to,—
I, by mighty studies, master.



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à tu descanso, en mullidas
flores, tendrà blando lecho.
A todas horas tendràs
Damas, que te estèn sirviendo,
que, como soy en comun
la Culpa, conmigo tengo
y en particular à todas
las que se precian de serlo.

*Và dexando caer el Hombre las Flores
del Ramillete poco à poco.*

Y sobre todo tendràs
los regalos de mi pecho,
las caricias de mis brazos,
los alhagos de mi afecto,
las finezas de mi amor,
la verdad de mi deseo,
la atencion de mi alvedrio,
de mi vida el rendimiento :
y finalmente, delicias,
gustos, regalos, contentos,
placeres, dichas, favores,
musicas, bayles, y juegos.

Hombre. No sè qué he de respon-
der, *Ap.*

porque divertido, oyendo
la retorica suave
de su voz, fui deshaciendo
el Ramo de las Virtudes,
que desperdiciadas veo,
y ajadas entre mis manos ;
pero què mucho, si advierto,
que para que ella me hablasse
apartè mi entendimiento ?
Sin èl hablaré. Gallarda
Circe, à tus voces atento,
de mi me olvido, y yà solo
de tu hermosura me acuerdo.

Shall at once thy senses flatter.
Thy enraptured sight shall revel
In these sweet delicious gardens,
Which to us are bowers of Eden
Full of every form of gladness.
In a soft bed shalt thou sleep,
Where the touch that looketh after
Thy repose, on downiest flower leaves
Shall outspread thy pleasant pallet.
Lovely ladies every hour
Shall their various service grant thee,
Whom, as Sin supreme, I keep
Here at once my slaves and partners,
Specially all those who are
To my service self-attracted.

*During the latter part of this address
the Man has let fall the flowers of his
nosegay one by one.*

But above all other joys,
Wilt thou have my heart's free lar-
gess,
The delight of my embraces,
The sweet proof of my attachment,
All the fondness of my love,
All the truth desire implanteth,
The devotion of my will ;
Of my life the sweet enthrallment :
In a word, delicious joys—
Raptures, ravishments, entrance-
ments,
Pleasures, blisses, fondest favours—
Sports and plays, and songs and
dances.

Man. [*aside*] Ah! I know not what
to say!

Ah! I know not what to answer!
Since, oblivious of myself,
Listening to her sweet-toned accents,
I have been, ah, me! destroying
All the beauty of this branchlet.
Withered in my hand it lies,
At my feet its leaves lie scatter'd.
But what wonder, when I think
In my Understanding's absence,
Has she spoken to me thus?
Thus without him then, I answer:—
Circe fair, in mute attention
I unto thy sweet voice hearken,

A tus Palacios me guia,
 porque ser tu huesped quiero
 desde oy, estimando humilde
 tan corteses cumplimientos.

Culp. Venci. La Musica buelva
 à repetir sus acentos;
 y esos gallardos Palacios,
 que està en el duro centro
 del Monte, sus puertas abran,
 que vâ gran huesped à ellos.

Descubrese un Palacio muy vistoso.

Odio. Al Entendimiento aguarda
 antes, Señor, que entres dentro,
 porque sepas donde estàs.

Homb. Para què? pues es tan cierto
 que no entrâra, si supiera
 (ay de mî!) mi Entendimiento.

Gusto. Dices bien, vamos sin èl;
 para què acá le querèmos,
 que es un Ministro cansado,
 todo limpio, y nada puerco?

Music. En hora dichosa venga
 à estos jardines amenos
 el Peregrino del Mar,
 donde halle seguro puerto.

*Vanse, dadas las manos, y sale el
 Entendimiento.*

Entend. Hombre, espera, escucha,
 aguarda,
 no entres en esse sobervio
 Alcazar, porque no sabes
 los peligros que està dentro.
 Mas ay de mî! con las voces,
 que le han tenido suspenso,
 no me oye: Què bien (ay triste!)
 se echa de vèr, pues pudieron
 los alhagos de la Culpa,
 los hechizos, y venenos
 moverle, que me tenìa
 retirado! porque es cierto
 que à tenerme à mî consigo,
 no se rindiera tan presto.

Self-forgetting, lost in dreaming,
 By thy wondrous beauty dazzled.
 Lead me to thy longed-for palace.
 As thy guest, thy slave command me.
 Let my humble acquiescence
 For thy courtesy thus thank thee.

Sin. I have conquer'd!—once again
 Music sing your sweetest accents,
 And my beauteous palace home,
 Which amid these mountains stand-
 eth,

Open wide your dazzling doors
 For the great guest who advanceth.

A magnificent palace appears.

Hearing. Oh! my lord, before thou
 goest

Where thou know'st not what may
 happen,

Here await thy Understanding.

Man. Wherefore? since if thus I acted,
 Ah! I know too well that *he*
 Ne'er would sanction my advances.

Taste. Right! without him let us go:—
 What's the use of being saddled
 With a pig and pleasure hating
 Cool cantankerous old carper?—

Music. Happy, happy be the hour,
 That to these delicious gardens
 Comes the Pilgrim of the sea
 In a safe port happily landed:—

*Exeunt all hand in hand. The Under-
 standing enters from the opposite side.*

Underst. Hear! weak Man, oh! listen!
 stay!

Enter not that pride-built castle,
 Since thou knowest not the quick-
 sands

On whose dangerous top it standeth:
 But, ah, me! their flattering songs
 Keep his senses so abstracted,
 That he hears me not! How soon
 Can it now be seen, O sadness!
 That the lustful lures of sin,
 That her philters and enchantments
 Have the power to overwhelm him
 In his Understanding's absence.
 Since with *me*, he would not have
 His consent so freely granted.

Salte la Penitencia.

Penit. Entendimiento, què voces
son estas que dàs al viento?

Entend. Lastimas son de aver dado
mala cuenta de un sugeto,
que Dios me entregò: Oy el Hombre
me ha dexado, de mí huyendo
se ha entrado en esse Palacio,
poblado de Encantamientos.
Las Virtudes que adquirió,
con un arrepentimiento
que tuvo, desperdiciadas
en el ayre las encuentro.

Mira à las Flores.

Penit. Pues yo las recogeré,
guardandolas para el tiempo
que arrepentido me busque,
de su culpa, y de su yerro.

Entend. Sin mì está, que no estuviera,
conmigo (ay de mí!) tan ciego,
que se olvidàra de ti.

Penitencia. Darte yo una industria
quiero,
para sacarle de aquesse
encanto; toca en su pecho
al arma, pues escuchando
este belicoso estruendo,
(haciendole de sí mismo
siempre mortales acuerdos)
veràs, que con tal temor
creera advertido, y atento
à su Entendimiento, donde
està sin Entendimiento.

*Salen la Culpa, y el Hombre, y los
Sentidos, y canta la Musica.*

Music. Compitiendo con las selvas,
donde las flores madrugan,
los paxaros en el viento
forman Abriles de plumas.

Enter Penance.

Penance. Why these outcries, Under-
standing,

That thou to the winds imparteth?

Underst. Wailings are they for dis-
charging

Towards my human ward so badly
Duties trusted me by God.

Man has left me, hath departed,
Fled me but just now, and entered

This enchantment-peopled palace;

All the virtues which by thee

Were to him repentant granted,

As I entered here, I found

By the wanton breezes scatter'd.

Penance (seeing them on the ground).

I shall re-collect them all

And preserve them 'till he ask me

For them once again, when he

Feels repentant for his lapses.

Underst. Ah! without me is he now!

With me, never had such hardness

Steeled his heart forgetting thee!—

Penance. I shall show thee in what
manner

Thou mayst yet perchance release
him

From the chains of this enchant-
ment:

Touch the key-note of his soul,—

Sound to arms! the martial clatter

(For of death and deathfullest omens

Ever breathes the call to battle!)

Soon will wake him from the stupor

That his memory now doth darken:—

Then he will attend to thee,

Now without thee he advanceth.

*Enter Sin, the Man, and the Senses,
and Music sings.*

Music. With the blossomed boughs
competing,

When the sweet flowers rise from
slumber,²¹

Birds an April of the Air

Fashion with their painted plumage.

²¹ In this scene the asonante vowels of the original are *u, a*: in the translation, *u, e*, or their equivalents in sound, are used.



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siendo ramilletes vivos :
 Y assi, quanto entre esta suma
 deydad, las flores, y fuentes
 de la tierra, con industria,
 paxaros forman de rosas,
 por igualar su hermosura :

Ella, y Musica.

Los paxaros en el viento
 forman Abriles de plumas.

Mus. De una belleza engañados,
 por Aurora la saludan,
 y viendo sus bellos ojos,
 quedan vanos de su culpa.

Homb. Toda essa belleza, toda
 essa varia compostura
 de vientos, y quadros, que
 emulos siempre se usurpan
 la alabanza, dignamente
 sus trofeos assegura,
 quando al saludar tu vista
 à todas horas te juzga
 Aurora de essas Montañas,
 haciendo que se confundan
 en los tormentos del dia
 salpicadas las purpureas
 hojas ; pues aunque haya Aves,
 y flores del dia en la cuna,
 bebiendo à la Aurora el llanto,
 que cendales de oro enjuga,
 el verte segunda vez,
 con nueva salva segunda :

El, y Musica.

De tu belleza engañados
 por Aurora la saludan.

Culp. Culpa fuera de las aves,
 y las flores, porque nunca
 para equivocar deydades
 hallar pudieran disculpa.

Has unto her azure plains
 Flowers of other kinds conducted,
 Which, upborne on myriad wings,
 Living nosegays float and flutter.
 And as Earth's young goddess fair
 With her flowers and founts con-
 structeth

Spring's sweet Paradise below,
 So the other in her upper
 Beauteous realm of birds makes roses
 Rivalling the rich ones under.

Sin and Music together.

Birds an April of the Air
 Fashion with their painted plumage
Music. By her loveliness deceived,
 For Aurora they salute her,
 And beholding her bright eyes,
 Love the sweet mistake they suffer.

Man. All this fair variety,
 All this loveliness that surgeth
 Up from billowy buds of bloom,
 By the wandering zephyrs ruffled,
 All this realm of spring, whose crown
 Earth and Sky in turn usurpeth,
 When it looks upon thy face,
 Every moment doth it judge thee
 The Aurora of these hills,
 Blending hours that erst were sun-
 der'd,

Streaking in the noontide's glow
 All the leaves with roseate purple,
 So that birds and flowers that drank
 Morning's pearly tears unnumbered
 Round the cradle of the Day,
 Tears that from her eyes she brushes
 With the golden-threaded clouds,
 Seeing on the horizon under
 Thee arise a second time,
 Hail thee with new matin music.

The Man and Music together.

By thy loveliness deceived
 For Aurora they salute thee :—

Sin. This were wrong in bird and
 flower.

Bird and flower are both excuseless
 For confounding goddesses,
 Whom their separate shapes have
 sunder'd.

Homb. Si es culpa, ò acierto, no
es justo que yo lo arguya ;
pero bien sè, que mi amor
oy de su parte assegura ;
que aunque culpa decir sea,
que por Aurora te anuncian
flores, y aves ; ni las aves,
ni las flores se disculpan
de essa culpa, porque antes
sè, que con causa mas justa,

El, y Musica.

en viendo tus bellos ojos,
quedan vanos de su culpa.

Gusto. Yà que me ha tocado à mi,
(que en efecto soy la Gula)
preveniros las viandas,
en cuya alegre dulzura,
quanto corre, nada, y buela
registro entre mil dulzuras
su sabor, desnudo yà
de piel, de escama, y de pluma,
mirad adonde quereis
comer oy.

Lisonj. Sea con una
ceremonia lisonjera.

Gusto. La Lisonja es muy astuta,
pues que sabe sembrar mesas
tan candidas, y purpureas.

*Sale por debaxo del Tablado una Mesa
con muchas viandas, y sientase la
Culpa, y Ulises, y los demàs sirven, y
los Sentidos se sient an en el suelo.*

Culp. Sientate, y todos
os sentad en la verdura
de essas flores.

Lasciv. Pues yo quiero
que no todas se atribuyan
las finezas, sin que à mi
el Huesped me deba una.

Man. If 'tis right or no, the point
It were wrong I argued further.
This though know I well, my love
Is of *one* thing well assured,—
That although 't were wrong to say
That the flowers and birds misjudge
thee

For Aurora, bird and flower
Would not wish to be excuséd
For that fault, since they, I feel,
Acting with impulsive justness—

The Man and Music together.

In beholding thy bright eyes,
Love the sweet mistake they suffer.

Taste. Now since it devolves on me
(I who am thy Taste), the duty
Of providing for thy need
Viands culled from out the number
Of the things that swim or fly,
Or possess the earth's green surface,
'Mid whose thousand varied forms,
Stript of skin, of scale, and plumage,
I their hidden savours seize,—
Think where art thou to have sup-
per?—

Flattery. Here with all due service
fair,

Let it on the spot be usher'd.

Taste. What a clever lass is this!!
Since with skill as sharp as sudden
Tables o'er the ground she scatters
Gleaming all with plate and purple.

*A table sumptuously provided with viands
rises from beneath. Sin and Ulysses
place themselves at the table, the Sen-
ses on the ground : all are waited on
by the others.*

Sin. Sit, Ulyssès, at my side :—
On the soft and verdurous turf here
Let the rest recline.

Voluptuousness. Since I
Would not that our guest should num-
ber
Every courtesy as thine,
One on my part thou wilt suffer :

Aquella letera cantad,
que yo hice.

Homb. Pues si es tuya
serà amorosa.

Lasciv. Sí es.

Homb. No ay Dama aqui, que no acuda
á un Sentido.

Gusto. Si señor,
pero victor.

Homb. Quién?

Gusto. La Gula.

Music. Si quereis gozar florida
edad entre dulce suerte,
olvidate de la muerte,
y acuerdate de la vida.

Culp. No canteis mas; què atrevida
voz nuestros gustos divierte?

*Tocan Caxas, y alborotanse todos, y
dicen dentro el Entendimiento, y la
Penitencia.*

Entend. Ulises, Capitan fuerte,
si quieres dicha crecida,

Penit. Olvidate de la vida.

Entend. Y acuerdate de la muerte.

Culp. Quién, con tanto atrevimiento,
truca el gusto en confusion?

Homb. Circe, las que escuchas son
voces de mi Entendimiento,
èl me ha llamado, è intento
responderle.

Culp. De èl te olvida.

Hombr. Suelta.

Culp. Es accion atrevida.

Cantad, porque no se assombre
de oír aquella voz el Hombre.

Music. Acuerdate de la vida.

Homb. Sì harè, que bien larga es:
y despues tendré lugar
para sentir, y llorar,

Sing that little canzonet
Made by me.

Man. Its gentle burden
Must be love, if thine it be.

Volupt. So it is.

Man. Each Sense is suited
With a separate lady.

Taste. Yes;
But there's one deserves a bumper.

Man. Who is she?

Taste. Intemperance.

Music. Wouldst thou, Man, to rapture
give

Life's young hours that flower and fly,
Oh! forget that thou must die!

And but think that thou dost live!

Sin. Cease the song! what voice doth
strive

Thus to mar our joy thereby?

*A sound of drums and voices is heard
from within: all start in surprise. The
Understanding and Penance answer
from within.*

Underst. Valiant soldier! from on high
Wouldst thou lasting bliss receive?—

Penance. Oh! forget that thou dost
live!—

Underst. And remember thou must
die!—

Sin. Who is this whose bold voice
breaketh

Rudely on my startled ear?

Man. 'T is my inner voice you hear—
'T is my understanding speaketh.
Him my answering conscience seek-
eth.

Sin. Heed him not, no answer give.

Man. Let me go.

Sin. Thou goest to grieve.
Sing once more, lest Man should hear
That mysterious voice severe.

Music. Oh! remember thou dost live!

Man. Be it so: the days extend;
Life is long and full of joy:—
For contrition and annoy



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he de entrar, porque no fuera
Entendimiento; si aqui
temiera morir: assi,
Ulises, te has olvidado
de ti mismo? Assi entregado
à unos placeres fingidos,
que sin mi, y con tus sentidos
aqui vives engañado?

Culp. Estarà (dime) mejor,
creido de tu prudencia,
allà con la Penitencia,
adonde todo es horror,
todo tristeza, y pavor,
que aqui, donde le divierte
tanta gloria?

Entend. Sí, si advierte,
que aquesta gloria es fingida.

Culp. Cantad, cantad.

Music. Vida, vida.

Ent. Tocad, tocad: muerte, muerte.

Hombr. Dices bien, à ti te creen
los influxos de mi estrella.

Culp. Pues dexasme?

Hombr. Ay Culpa bella,
que tu tambien dices bien?

Entend. Valor mis voces te den.

Culp. Muevate el verme rendida.

Entend. Nada el seguirme te impida:
tocad.

Culp. Cantad.

Hombr. Pena fuerte!

Music. Vida, vida.

Entend. Muerte, muerte.

Dentro Penitencia.

Penit. Muerte, muerte.

Music. Vida, vida.

Entend. Este es bien percedero.

Culp. Aquella es pena cruel.

Entend. Por esso espera laurel.

Culp. Goza tu vida primero.

Entend. Mira que es encanto fiero.

By this monster's sorceries slain,
Here I enter: since 't is plain,
I were not myself, or thine
God-given guide, should I resign
Death itself defending thee:
Hast thou lost all memory
Of thyself? that thus, Ulysses,
Thou wouldst live in phantom blisses
Here with thy senses—without *me*?

Sin. Were it better, then, that he,
Following thy advice, should go,
Penance led, where all is woe—
All is grief and misery,
Than remain contentedly
Here, where on his every sigh
Pleasure waits?—

Underst. Undoubtedly,
If he knows she nought can give.

Sin. Sing! sing!

Music. 'T is sweet to live!

Underst. Peal! peal! Man needs must
die!

Man. True! oh true! my star to thee
Yields, O voice! that speaks within.

Sin. Canst thou leave me?

Man. Beauteous Sin,
Ah! thy voice, too, moveth me.

Underst. May my voice thy soul's
strength be!

Sin. May my tears thy love revive!

Underst. Follow me, be strong and
strive.

Drums rebeat.

Sin. Sing sweet!

Man. I try

Suffering's depths!

Music. To live!

Underst. To die!

Penance within.

Penance. To die! to die!

Music. To live! to live!

Underst. Life is but a dying day.

Sin. Death, a pang that strikes thee
down.

Underst. But it gives the laurel crown:

Sin. Life enjoy though, while you
may. [away.

Underst. Life's a dream that fades

Culp. Mira que es tormento fuerte.

Ent. En que eres mortal advierte.

Culp. No te acuerdes de esso, no.

Music. Vida.

Penit. Muerte.

Los dos. Quién venció?

Hombr. La memoria de la muerte.

Culp. Què importa que aya vencido,
si escaparte no podràs
de mì? En mi poder estàs,
sin reservarte un sentido.
Las flores que avia texido
la Penitencia, que eran
las virtudes que pudieran
salvarte, yà las perdiste,
tù mismo las deshiciste;
pues què alivio de mí esperan
oy tus ansias?

Entend. No te dè
aqueso desconfianza,
tèn en el Cielo esperanza,
que es columna de la Fè.
Essas virtudes, yo sè,
que quando mas divertido
las avias esparcido,
para guardarlas llegò
à recogerlas...

Culpa. Quién?

Sale la Penitencia.

Penitencia. Yo,
que el Arco de paz he sido,
que si oy en Carro Triunfal
me llegas à vèr sentada,
substituyendo Dosèl
de oro, de purpura, y nacar,
es, porque á triunfar de tí
vengo, que quando me llama
del hombre el Entendimiento,
no puedo yo hacerle falta.

Sin. Death's a pain that all would
fly.

Underst. Think thy final hour draws
nigh.

Sin. Think not so till life be done.

Music. Life!

Penance [within]. Death!

Underst. and Sin together.—Say which
has won?

Man. The remembrance I must die.

Sin. What imports it thus the gaining
Barren victory, if thou art
Powerless to escape my art?
Thou, with not a sense remaining:
Since the potent flowers disdain,ing,
Woven for thee by Heaven's host—
Which the hands of Penance gave
thee,
Virtues were they which could save
thee,

Thou hast scattered, thou hast lost.
Wherefore, therefore, canst thou boast
Thou art free from me to-day?—

Underst. Do not, therefore, Man, mis-
trust thee,

Hope in Heaven, to *that* entrust
thee—

Hope, the Faith's best prop and stay,
All those virtues flown away,
Scattered in thy wantonness,—
One, I know, doth hither press
To restore them; from the sky
Comes she hither now.

Sin. Who?

Penance [enters]. I,
Erst who wore the rainbow's dress:
Who if in a car triumphal
Thou to-day behold'st me seated²²
'Neath a canopy, wherein
Purple, pearl, and gold are blended,
'Tis because I come to triumph
Over thee, for whensoever
Calleth me Man's Understanding,
Never is the call neglected.
All the virtues which he squander'd

²² The metre in the original changes to asonante alternate vowel rhymes in *a, a*. For these I have substituted corresponding ones in *e, e*.

Las virtudes, que sin èl
desperdiçò su ignorancia,
yo recogì; pues es cierto,
que si se adquieren en Gracia,
siempre que buelva por ellas,
en deposito las halla.
Y para que el Hombre vea,
que solas à vencer bastan
tus Encantos, oy veràs
todas aquestas viandas,
del viento desvanecidas,
en humo, en polvo, y en nada,
mostrando con este exemplo
lo que son glorias humanas,
pues el Manjar solamente,
que es eterno, es el del alma::
este es el Pan Soberano,
que veis yà sobre esta Tabla:
la Penitencia os le ofrece,
que sin ella (cosa es clara)
que verle no merecia
el hombre con glorias tantas.
Sentidos esto no es Pan,
sino mas noble substancia:
Carne, y Sangre es, porque huyendo
las especies, que aì estaban,
los accidentes no mas
quedaron en Hostia blanca.

Culp. Como quieres que te crean
los Sentidos con quien hablas,
si todos conoceràn
que los ofendes, y agravias?
Llega, Olfato, llega à oler
esse Pan: en èl què hallas,
Pan, ò Carne?

Van llegando los Sentidos.

Olfato. De Pan es
et olor.

Culp. Llega, què aguardas,
Gusto?

Gusto. Este gusto es de Pan.

Culp. Llega, Tacto, què te espantas,
dí lo que tocas?

In his ignorance, demented,
I have here regather'd, since
Certain 't is that when presented
By the hand of Grace they've been,
He who turneth back repentant,
Ever findeth them again,
Safely guarded and preservèd.
And that Man may know that they
Can alone thy sorceries render
Powerless, thou wilt now behold
All the viands here collected
Vanish into air, and leave
Nought behind to tell their presence;
Showing thus how human glory
Is as false as evanescent;
Since the only food that lasteth
Is the food for souls intended—
Is the eternal Bread of Life
Which now fills this table's centre.
It is Penance that presents it, [tain)
Since without her (nought more cer-
Man deserveth not to witness
So much glory manifested.
Yet, ye Senses, 't is not Bread,
But a substance most transcendent:
It is Flesh and Blood; because,
When the substance is dissever'd
From the species, the White Host
then

But the accidents preserveth.

Sin. How canst thou expect to gain
Credence from thy outraged senses,
When they come to understand
How you wrong them and offend
them?

Smell, come here, and with thy sense
Test this bread, this substance,—tell
me,

Is it bread or flesh?

The Senses approach.

Smell. Its smell
Is the smell of bread.

Sin. Taste, enter,
Try it thou.

Taste. Its taste is plainly
That of bread.

Sin. Touch, come, why tremble?
Say what's this thou touchest?



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*Tocan Clarines, y descubrese la Nave,
y todos se meten dentro.*

Culp. Tribulaciones no son
en la Escritura las aguas?
Luego à padecer le llevas
trabajos, afanès, y ansias.

Penit. Sì; pero estos son regalos,
con que mas merito alcanza.

Dent. tod. Buen viage, buen viage.

Culp. Aquessas voces me matan.

Hombr. Circe cruel, pues que supe
vencer prodigiosas Magias,
quedate, donde te sirva
de monumento tu Alcazar.

Culp. Ondas, que tanto Baxèl
sufris sobre las espaldas,
en vuestros senos de nieve
le dad sepulcro de plata.

Penit. Ondas serenas, al blando
movimiento de las aguas,
porque vuestros pavimentos
no sean montes, sino alcazar.

Culp. Vientos que soplais del Norte
no le saqueis de Tinacria,
y chocad, cascado el pino,
en aquellas peñas altas.

Penit. Notos, que venis del Austro,
soplad con suaves auras,
porque hasta el Puerto de Hostia
oy à salvamento salga.

Ent. Buen viage nos prometen
las señas de la bonanza.

Culp. Haced, vicios, que el velamen
todo pedazos se haga,
y buelto el Barco, sea tumba
con piramides, y jarcias.

Hombr. Haced, Virtudes, que rompa
la quilla suave, y blanda,
encrespando las espumas
vidrios de nieve, y de plata..

Trumpets peal. The ship is discovered,
and all go on board.

Sin. Do the Scriptures not compare
Waves with woes that life engenders?
Thither then ye go to suffer
Toils, discomforts, and distresses.

Penance. Yes, but these prove plea-
sures when
They to greater favour lead them.

All. Happy voyage! happy voyage!

Sin. Oh! with rage these cries o'er-
whelm me.

Man. Cruel Circe, now that all—
All thy wondrous wiles have ended,
Drag thy palace o'er thy head,
As thy monument and emblem.

Sin. Waves, that on your foam-white
shoulders
Bear the weight of such a vessel,
Give it swift a silver tomb
In your bosom's snowy centres.

Penance. Halcyon waves, with silent
swell
Roll your waters smooth and level;
Like the bright floor of a palace,
Let your azure hills extend them.

Sin. Winds, that from the black north
blow,
Waft it not to seas serener,
But upon Trinacrian rocks
Dash its broken hull to pieces.

Penance. Airs, that float from southern
skies,
Gently breathe with favouring bree-
zes,
That it may the happy haven
Of the Host in safety enter.

Underst. Friends, a prosperous voyage
promise

All the signs of settled weather.

Sin. Vices, tear the canvas down,
Rend the rified sails in pieces,
Let the obeliscal masts
Make the hull a tomb resemble.

Man. Virtues, for its curved keel
Make the sea-way smooth and settled,
Send its prow swift-gliding through
Silvery foam, a snow-scaled serpent.

Todos. Buen viage, buen viage,
que vientos, y ondas amaynan.

Homb. Circe, poco tus Encantos
han podido, pues me saca
(ay de mì!) la Iris Divina,
coronada de esperanzas.

Pen. Circe, yà su Entendimiento
va con èl: poco las trazas
de tu Magia te han valido.

Culp. Llenas estoy de pena, y rabia:
Si yo soy vivora, còmo
no me rompo las entrañas?
Si soy aspid, còmo oy
mi veneno no me mata?
Pedazos del corazon
me arrancarè con mis ansias
para tirarlos al Cielo:
mas à mí, què me acobarda?
Si en la Nave de la Iglesia
huyes de mì, sabrè darla
tormentas que la zozobren;
mas ay de mì! que ya es vana
mi Ciencia, pues que la veo
navegar con tal bonanza:
falten todos mis Sentidos,
pues que yà poder me falta.

*Suena Terremoto, y la ruido se bunde
el Palacio.*

Confundanse los Palacios,
y bolviendose montañas
obscuras, no viva en ellas
sino yo, porque me saca
à quien encantado tuve
la Penitencia Sagrada,
en virtud de aquel Divino
Manjar, que dà por Vianda.

Todos. A cuyo grande milagro
el Mundo mil Fiestas haga,
principalmente MADRID,
noble corazon de España,
que en celebrar à Dios Fiesta
con la opinion se levanta.

*Con esta repeticion, y al son de las
Chirimias, se dà FIN AL AUTO.*

All. Happy voyage! happy voyage!
Sing the winds and waves together.

Man. Circe, now thy sorceries vile
Harm me not, since from thy meshes
Faith, the Heavenly Iris, leads me
With Hope's glory round my temples.

Penance. Circe, now that as his guide
See his Understanding wendeth,
Little can thy sorceries wound him.

Sin. Rage and anguish overwhelm me!
If I am a viper, say
Why, O heart! dost thou not sever?
If I am an asp, oh! why
Does not my own poison end me?
In my anguish I will tear
Out my heart in purple pieces
But to dash them in Heaven's face.
Wherefore, though, should fear un-
nerve me?

If thou fliest from me thus
In the Church's saving vessel,
Know, my storms can overwhelm it.
Idle boast! for all is ended,—
All my science now is o'er,
Since the ship sails on so steady:
All my senses leave me too,
Since my magic power hath left me!

*There is heard the sound of an earth-
quake, and the Palace disappears.*
Palaces sink down in ruin,
And the dark hills that upheld them
Reappear in all their wildness—
I sole dweller in the desert:
For from me hath holy Penance
Him released, whom charm'd I beheld
here,

By the virtue this divinest
Bread, this Heavenly food, possesses.

All. Let this mightiest miracle
Over all the world be feted,
Specially within Madrid,
City where Spain's proud heart swel-
leth,

Which, in honouring God's Body,
Takes the foremost place for ever.

END OF THE AUTO.

ART. II.—*The Sibylline Riddle.* By W. H. SCOTT, M.A.

THE Sibylline Riddle is one of the curiosities of literature. It is found in the Greek poems, or rather metrical collection, called the "Sibylline Oracles"; and it came into notice at the time of the first publication of that collection after the revival of letters. Many attempts to interpret it, but none of them satisfactory, were made by the learned of the day, of which the record may be seen in the works of Morhof, Isaac Vossius, John Albert Fabricius, and other writers. It became, under the title of "The Gordian Knot", even the subject of a book; but from that day to the present (for in 1856 the learned French editor of the Sibyllines, M. Alexandre,¹ admits that he has nothing to add on this subject to previous conjectures) it has remained a mystery,—a solitary and singular specimen of a puzzle devised by man's ingenuity, which has resisted solution for perhaps seventeen centuries. With antecedents so unpromising, it may seem rash for any one now to attack the same problem in the confidence of success; yet I hope, nevertheless, to make it evident, in the course of a few pages, that its true interpretation may be determined with perfect certainty, and that the real wonder is rather, how an interpretation so obvious, when once given, could so long have escaped the observation of keen inquirers. The subject being one little familiar to most readers, it is necessary to introduce it with some general account of the collection in which the riddle occurs.

When Hermas, in his vision, saw, as he relates it,² a woman of venerable age come and present him with a volume containing sacred knowledge, and on being questioned by the angel at his side who she was, said he thought she was a Sibyl, but was answered that "he was mistaken, for she was no Sibyl, but the Church of God", he could little have imagined that there was actually in course of formation about that very time (the date of his vision being supposed to be not very long subsequent to the fall of Jerusalem) a volume of a religious kind, which

¹ XPHEMOI ΣΙΒΥΛΛΙΑΚΟΙ, curante G. Alexandre, 2 vols., Paris, 1851-1856.

² Hermæ Pastor, Sib. I., Vis. I., c. 2; Vis. II., c. 4.

Attempts made to interpret Sibylline Riddle,

not hitherto successful.

A true interpretation now offered.

Brief account of Sibylline Oracles,



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spired, as to announce even the name of the Blessed Virgin, and the number of baskets containing the fragments of the loaves and fishes miraculously multiplied,⁴ never could have done more in the long run than impair the prerogatives of those of Isaias or Daniel in the Sacred Canon; whereas, admitting them to be fictitious, we have the advantage of regarding them as monuments of the mode of thinking or speculating, on sacred or other subjects, in the age when they were composed; as, for instance, when they are employed in the form of ante-Nicene testimony to our Lord's divinity. They are literary weeds, to which time gives an accidental value, as is often the case; and, as a wilderness of vegetation may be converted by the operation of centuries into a rich coal mine, so may these yield a treasure to the future of which they gave no promise on their first appearance.

They consist of eight books, with four others found by Maii; As to their contents and arrangement, they consist in the ordinary editions of eight "books", or sets of compositions, of various length, some of them apparently complete, some fragmentary, and some a patchwork of heterogeneous pieces, strung together by the Greek editor (so to call him), who lived probably about the time of Justinian,⁵ and who, as he tells us in his preface, reduced the "oracles" to order and harmony, and the consecutive form in which we now have them. But to these eight have to be added in the present day four others, an eleventh, twelfth, thirteenth, and fourteenth book, published from the Vatican manuscripts for the first time by Cardinal Maii in 1828, and lately edited, in conjunction with the original series, with a very elaborate and learned apparatus of notes and essays, by M. Alexandre, who decides, after careful examination (and we may accept his conclusion), that the first eight are identical in the main with the Sibylline Oracles so frequently quoted by the Fathers down to the time of Lactantius.

not all written at one time, As to the date of the collection, it is not to be imagined that they were written by any means simultaneously. Josephus, writing under Domitian, certainly never could have quoted a work written under the Antonines. But we are sure that the fifth Sibylline was then written; for it contains what professes to be a prophecy of the emperors of Rome in regular succession, from

⁴ Orac. Sibyll. i., 358, viii. 458.

⁵ Alexandre, Excurs. v., c. xv.

Julius Cæsar down to M. Aurelius, indicating each emperor by the numeral power of the initial letter of his name, together, usually, with some historical fact in the life of each;⁶ and as nothing historical is related beyond Aurelius, it is tolerably evident that nothing more was known to the composer. A similar inference must be drawn as to the eighth book, where it is said in the same manner that a series of fifteen kings shall terminate in one bearing the name of the Adriatic, that is, Hadrian, and that after Hadrian there shall be three (spoken of in the fifth book as “three branches”), who “shall live in the very last days” (πανύστατον ἡμᾶρ ἔχοντες), these being the Antonines, Pius and Aurelius, and Lucius Verus. Again, the date of the composition of the fourth book is much earlier, being determined by the description at the end of it of the eruption of Vesuvius, to the period of the reign of Titus, when that eruption occurred, or of Domitian, his successor. On the other hand, the new “Oracles” discovered by Maii descend to Valerian and Gallienus, beyond the middle of the third century; and though not without value, whether as illustrating the mode of the formation of the original eight, or as repeating, with variations, and so explaining, particular passages in the former which present difficulties, are of secondary interest, and very inferior in composition. The books of the “Oracles” vary also in the indications which they contain of the place where they were composed, some being assignable to Asia Minor, and some to Alexandria.

More than this need hardly be said, and less could not, by way of introduction to the notice of the first book of the series, which is the one containing the riddle. It has more of the character of a poem than the other books, and is largely made up of words and fragments of verses derived from Hesiod. It begins with an imitation of the Scriptural account of the creation and fall of man, after which come the generations succeeding one another from Adam, which are given as five, down to the flood of Noe. Of the flood itself there is a minute and vigorous description, in the course of which comes the riddle. Then follows the mention of the posterity of Noe (who are considered to make the sixth generation, and are identified with the Titans), down to the building (so we gather

or in one place.

Riddle is in first book. Contents of the book,

⁶ E. g. Nerva is described as Πεντηκοντάρθμος γεραρός βροτός, v. 41.

from the parallel passage in the third book) of the tower of Babel; after which comes a transition to the Messias, whose name, Jesus, is symbolically announced as containing "eight monads, eight decads, and eight hundreds", that is, the numeral value, 888, of the letters *Ἰησοῦς* added together. To this "Son of the immortal God, coming in the flesh, and made like to mortals, priests", says the Sibyl, "shall bring, gold, myrrh, and frankincense". Then follow some of the principal events of His life; then His passion, His crucifixion, and resurrection; the whole concluding with the announcement, that, in punishment for the sin of the Hebrews, by whom He was crucified, the "Roman king" shall plunder them of their gold and silver, shall destroy their temple, and drive them into exile; "and when this shall happen, then also shall be evil contentions in all the world, and the cities shall lament for one another, because they have done an evil deed, and have received into their bosom the wrath of God".

and remarkable
conclusion
of it

Question
as to its
date interesting,

It would be interesting to investigate the question of the date of this composition. M. Alexandre, the editor before mentioned, is disposed to assign it, notwithstanding the place actually occupied by it at the head of the series, to the reign of Commodus; his reasons being partly the fact of its not being referred to by the early Fathers, and partly the notice with which it concludes, of the calamities which were to come upon the world after the fall of Jerusalem, and which, in fact, began to break upon the empire in the time of Commodus. Yet it may reasonably be argued that the closing words of it, anticipating, as they seem to do, the coming of calamities as a consequence of the destruction of Jerusalem, are identical in their tone with the close of the fourth Sibylline, already referred to, where the eruption of Vesuvius is in fact represented as a judgment provoked by the overthrow of the Holy City;⁷ whence it would follow that it was written at least as early as the fourth Sibylline, if not earlier. Nor would there be anything to prevent our explaining the fact of its not being quoted by the early Fathers, as owing partly to the perplexity likely to be occasioned in their minds by the riddle which occurs in it, and partly by the little profession which it makes of being the work of the Sibyl, for it is put into the mouth of one who was in the

⁷ *Εὐσεβέων ὅτι φῦλον ἀναίτιον ἐξολέκουσι.*



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Ἡ λοιπή δὲ τὰ λοιπὰ, καὶ εἰσὶν ἄφωνα τὰ πέντε.
 Τοῦ παντός δ' ἀριθμοῦ ἑκατοντάδες εἰσὶ δις ὀκτώ,
 Καὶ τρεῖς τρεῖς δεκάδες, σὺν γ' ἑπτὰ γνοῦς δὲ τίς εἰμι,
 Οὐκ ἀμύητος ἔση θείης παρ' ἐμοίγε σοφίης.

(vv. 144–153).

Translated, it may stand thus:—

“ Be wise, discern me; He that is am I;
 The earth my footstool, and my robe the sky;
 With air encircled, girdled with the main;
 And all around me runs the starry train.
 Discern me well; four syllables are mine;
 In each two letters, out of letters nine;
 Save that three letters to the last belong;
 And five are consonants the nine among.
 But of my perfect number there will be
 Hundreds twice eight, and decads three times three;
 Add seven to these, and if thou read'st me right,
 True heavenly wisdom will have purged thy sight”.

Faulty
solutions
of it.

This curious production has at least the merit of ingenuity, and the shifts to which the commentators have been driven in their attempts to solve it, are amusingly desperate. Θεὸς Σωτὴρ (God the Saviour), and ἀνεκφώνος (the Unutterable), are generally considered the best answers; but recourse has been had even to chemistry, and φαοσφόρος and ἀρσενικόν have been offered in default of better. However, none of these wholly fulfil even the literal conditions of the riddle, to say nothing of their irrelevancy either to the context, or to the gravity of the subject, or both. What we want is a solution accurately complying with the terms given, on the one hand, and in harmony with the poem, as having reference to the deluge, on the other; and this, as I have said, is to be obtained only from the Apocalypse.

Its pecu-
liarities.

First, it is necessary to observe carefully the points of the riddle; for it is skilfully contrived, and contains several ambiguities. The statements with which it begins are simple. The name which it has in view is one of four syllables and nine letters, five of these being consonants and the rest vowels; and the syllables are severally composed of two letters, except the last syllable, which has three. Then follows the mention of a number—“twice eight hundred, three times three decads, and seven”. This it is natural to compute as 1697; yet the “seven” is ambiguous, and may mean, if we choose, “seven decads”, which, if so, must be added to the preceding nine decads; and the number resulting will then be not 1697, but 1760, which in fact is the one intended. Moreover, natural as it may be

to conclude, as the commentators have done, that this number is the sum of the numeral value of the nine letters composing the name, this is not necessary, nor is it asserted by the riddle. And lastly, there is an ambiguity, not unintentional, in the circumstance that the riddle does not say simply that "the whole number is 1760", but "of the whole number there is 1760", thus obscurely implying that the whole number intended is something larger than the sum mentioned.

Turning now to the Scriptural account of the events preceding the deluge, and comparing it with the Sibylline, we see that whilst in the command of the Almighty to Noe to prepare the ark, there is no mention of the Almighty revealing His name, or of anything directly throwing light on the introduction of this riddle; there is, on the other hand, an omission in the Sibylline narrative, of the announcement accompanying the command to enter the ark: "Yet awhile, . . . and I will rain upon the earth forty days and forty nights", although the Sibyllist was aware of it, for he afterwards speaks of Noe coming out of the ark on the forty-first day.¹⁰ Comparing, then, as it is natural to do, the omission with the insertion, the idea suggests itself that the Sibylline riddle may be the substitute for the Scriptural fact; or, in other words, the expression of that fact in a symbolical form.

The solution of the puzzle is now easy. The key to it is the passage in the Apocalypse, "I am Alpha and Omega, the beginning and the end, saith the Lord God, who is, and who was, and who is to come, the Almighty";¹¹ *Εγώ εἰμι τὸ Α καὶ τὸ Ω, ἀρχὴ καὶ τέλος, λέγει ὁ Κύριος, ὁ ὢν, καὶ ὁ ἦν, καὶ ὁ ἐρχόμενος.* Alpha and Omega (A and Ω), as being the beginning (*ἀρχὴ*) and the end (*τέλος*) of the letters, numerally taken, of the Greek alphabet, are the symbols of Him who is the first and the last, and comprehends time and creation in His own eternity. The Name, then, intended by the Sibyllist is *ἀρχὴ τέλος*, and the number equivalent to the name is A Ω. The Name precisely fulfils the conditions of the riddle, as containing nine letters, four syllables, five consonants, two letters in each of the three first syllables, and three in the fourth. And the number, rightly understood, fulfils them also; for A represents one, or one

Clue to the answer;

which is the A Ω, etc., in Apoc., i. 8.

¹⁰ V. 288. We are not concerned with the false history involved. Compare Gen., vii. 4, 12, 24; viii. 13, 16.

¹¹ Apoc., i. 8.

thousand,¹² as we choose to take it, and Ω is eight hundred; A and Ω, therefore, are equivalent together to 1800, which is in excess of the number in the riddle, which I have shown to be 1760, by just forty; the explanation of which is this: A and Ω being symbols of “the beginning and the end”, are employed by the Sibyllist as the measure of the period which he describes, from the Creation to the deluge; the deluge being the “destruction of the earth” and the “end of all flesh”,¹³ as the Creation was the beginning of it. But as the deluge itself, that is, the rain of forty days, was pending, and not

actually come, when the command was given by the Almighty for the preparation of the ark, this is expressed in the riddle by the diminution of the full 1800 to the amount of 40; exactly in accordance, it will be observed, with the words of the riddle, which does not say, “My whole number is 1760”, but “of my whole number there is 1760”, as before pointed out. The purport, then, of the enigmatical name, as introduced into the riddle, is simply this: “I am the beginning and the end (1800), and my number is even now within forty days of the end; of the whole number (τοῦ παντός δ' ἀριθμοῦ) there is at present 1760, and there remains 40”. The number 40 is thus separated off from the whole number, for the additional reason, that in Scripture it is the symbol of a time of waiting before judgment begins, and the language of the riddle is virtually analogous to the announcement of the impending catastrophe by the prophet Jonas, “Yet forty days, and Ninive shall be destroyed”.¹⁴ For a similar mode of mystical interpretation, involving the *addition* and *subtraction* of a number, we may consult a passage of St. Augustine on the fifth chapter of St. John's Gospel. He thus comments on the 38 years during which the sick man, whom our Lord cured, had laboured under his infirmity. The number 40 “in quadam perfectione commendatur”; and, as being the length of the fasts of Moses, Elias, our Lord, and of Lent, it especially denotes the good Christian's life, which is a *perfect* mortification. Now what is the reward of these forty days of life-long Lent? we find from the parable of the vineyard, that it is *denarius*, *i.e.*, a *ten*; add 10 to the 40 days of Lent, and we have the 50 days of Paschal time. So much for a holy life; it

Its use of forty in mystical sense.

Similar use of numbers by St. Augustine.

¹² *E. g.*, in the Codex Vaticanus, lately published, in Apoc., xiv. 20. ἀπὸ σταδίων αχ (1600 furlongs).

¹³ Gen., vi. 13-17. ¹⁴ Jonas, iii. 4.



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upon which the ink and colour appear as fresh as if their age had to be estimated by years instead of centuries. All the numerous manuscripts of this class have been found upon mummies or in tombs, and the vignettes, with which they are profusely ornamented, consist of representations of the dead, either in the processes of embalming and burial, or with reference to the future state according to the Egyptian doctrines. All of them contain either the whole or portions of one and the same text, which has been divided into chapters, and published by Dr. Lepsius from a Turin papyrus, under the name of the "Todtenbuch", or "Book of the Dead". Various portions of this remarkable book, to which Champollion gave the equally appropriate title of "Ritual", have been published at different times. One of the most beautiful of these fac-similes is that contained in the second volume of the *Description de l'Egypte*; but as that publication appeared before the great discovery of hieroglyphic decipherment, the different portions of the "Ritual" are not always printed in the right order. The great importance of the "Ritual", or Book of the Dead, lies, of course, in its being manifestly an authentic document, and a very extensive one, respecting the religious ideas of the ancient Egyptians. These ideas I hope to have future opportunities of illustrating in the pages of the ATLANTIS, but the task I propose to myself in the present article is a different and a less ambitious one.

The hieroglyphic text in Plate I. is taken from the forty-second chapter of the Turin Ritual, and contains what used to be considered the dedication of the different parts of the human body to as many divinities. I have selected it for illustration, because it is one of the easiest portions of the Ritual, and at the same time displays all the most remarkable peculiarities of the hieroglyphic mode of writing, in such a way as at once to render them intelligible to a beginner. Many long hieroglyphic texts, incomparably more interesting, have been translated and analyzed within the last few years by the great masters of the science, but the learned writings to which they have given birth presuppose a thorough acquaintance with all the previous works on hieroglyphic literature, and are therefore only available to initiated readers. It is for another class of readers that the present article is written, and I hope to be able to make myself understood without presupposing any previous

A portion of it selected for illustration in this article—why?

acquaintance with the subject, except such as may be easily got from Mr. Birch's short but admirable "Introduction to the Study of the Egyptian Hieroglyphs".

The hieroglyphic mode of writing differs from that used by European nations, not only by the vast number of signs employed, but chiefly by the use of *non-phonetic* signs. In our modern alphabets every letter is expressive of a sound. Of hieroglyphic signs, some are expressive of sounds, others of ideas; or, in technical language, some are *phonetic*, some *ideographic*. Peculiarities of hieroglyphic writing.

1. *Phonetic signs.* Whatever may have been their original character, some hieroglyphs are as purely alphabetic in their use as the letters of the Greek or Roman alphabets. Their number is but small, as will be seen by referring to the table¹ at the bottom of Plate II.; they are of constant occurrence, and, if no other hieroglyphs existed, it would be as easy to learn to read the Egyptian language as any other. The group made up of the signs A, H, A, is read AHA, an ox (in Coptic, εζε); U H, and R spell UHR (Coptic, ουρο), a dog; T, E, N, H, TENH (Coptic, τενε), a wing. The truth of this phonetic alphabet is easily verified by means of the numerous well-known proper names, Egyptian, Hebrew, Greek, and Roman, which are written with it, also by such groups as those just cited, which may with perfect certainty be identified with Coptic words. The identity is proved by means of Phonoglyphs.

2. *Ideographic signs.* If it be asked, how we can be sure that the groups AHA, UHR, and TENH, really correspond in sense to the Coptic εζε, ουρο and τενε, the reason is clear enough. The first group is generally followed by the picture of an *ox*, the second by that of a *dog*, and the third by that of a *wing*. In like manner the group MSUH is followed by the picture of a *crocodile*, in Coptic μεωε; MACH, by that of a pair of *scales*, in Coptic μεαυι; ASCH by that of a *sickle*, in Coptic οσε; SUH by that of an *egg* (Coptic, οουε); SaTI by that of an *arrow* (Coptic, Ideoglyphs.

¹ In this alphabet I have admitted only those signs which are of constant occurrence. All others occur much more rarely, and really belong to the class of ideographic signs used phonetically. One or two of these have been allowed to remain, because we shall have occasion to speak of them in the course of the article. They are distinguished from the others by an asterisk.

c&†). In all these examples we see the operation of the same law, viz., that a group written phonetically should be followed by a sign expressive of its sense. This is technically called the *determinative* of the group. Almost every hieroglyphic group has, at least, one determinative, which often is, but need not be, a pictorial representation of the idea expressed. Most determinatives have only a symbolical connection with the idea, and in many cases this connection is too recondite, or of too conventional a character, to be discovered. It must not, however, be supposed that the difficulty of reading is in any way increased by our ignorance of the *rationale* of this symbolism. When it has been observed that a considerable number of known words expressive of *evil* are followed by the *sparrow*, the ideographic use of that sign becomes perfectly intelligible, even though we may not be sure of knowing why the Egyptians chose the sparrow as a symbol of evil, rather than other objects represented in the list of hieroglyphs.

Phono-
glyphs
used
ideogra-
phically,
and ideo-
glyphs
used pho-
netically.

3. All hieroglyphic signs are either ideographic or phonetic. Some of the phonetic signs are, however, occasionally used ideographically, and many ideographic signs are often used phonetically. This change of use takes place according to fixed rules, otherwise the whole system would be thrown into inextricable confusion. It was said above that the signs used ideographically stood at the *end* of groups written phonetically. Sometimes, however, these ideographic signs stand by themselves, or at the beginning or middle of a word. In each of these cases they have a phonetic value which it is not always easy to account for, but may generally be supposed to correspond to the name of the object they represent. Thus the *ox* by itself would be read AHA, the *wing* TeNH. These signs followed by the mark of the plural, would be read, AHA.U, TeNH.U. And on the other hand the word KAHU, which signifies an *arm*, may take for its determinative the picture of an arm, although that sign has the alphabetic value A. No confusion can possibly spring from the observation of rules so definite as those which have been laid down, though, as we shall shortly see, difficulties sometimes certainly arise from a complication of these rules, or rather from uncertainty as to which rule should be applied to one or two individual cases.

All these fundamental principles were laid down by Champollion, and have been admirably illustrated in his



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Double
ortho-
graphy.

would be easy to multiply parallel instances⁴ from Champollion's Grammar and Dictionary to justify the assertion of Lepsius, that "certain signs, originally ideographic, are only employed phonetically [*i.e.* alphabetically] before certain others, which must be restored in the pronunciation when they are omitted". The latter, which may at pleasure be expressed or left out, are called by Lepsius, "phonetic complements". They are really redundant, but M. de Rougé has shown that this double orthography, which he calls a "pléonasme graphique", applies to all ideographic signs used phonetically. All such signs might be accompanied or not by their alphabetic equivalents or expletives, and syllabic signs might be placed at the beginning, middle, or end of their phonetic equivalents. "This mode of explaining one character by another", says Mr. Birch, "is of the utmost importance, for by it the value of several sounds is determined, which otherwise it would be impossible to assign"⁵.

As the fact has been vehemently denied,⁶ it is as well to insist upon it, that the only kind of syllabic value admitted by Egyptologists⁷ at the present day was fully

⁴ Champollion has brought many of them together. Gram. p. 64, seq.

⁵ Introduction to Study of Hieroglyphics, p. 237.

⁶ In the last number of the ATLANTIS, No. III., vol. 2, p. 91, I said that the *idea* of syllabic hieroglyphs was first suggested by Dr. Young, not by Dr. Seyffarth. I am now bound to say that M. Champollion-Figeac has proved that, as early as the year 1810, his illustrious brother had anticipated Dr. Young's rebus theory. On August 7 of that year, Champollion read before the "Société des Sciences et des Arts", of Grenoble, a very remarkable paper from which I select the following passage:—"Puisque tous les mots égyptiens sont formés de monosyllabes significatifs, ces mêmes monosyllabes devraient se réduire à un nombre fixe. Alors rien n'était plus facile que de composer un *Alphabet syllabique*, et selon toutes les probabilités telle était la nature des hiéroglyphes". Rev. Archéologique, xiv., p. 593.

⁷ I do not know how often it has been asserted in certain quarters, that M. de Rougé knew nothing about syllabic signs till 1850, when he is supposed to have learned the mysterious truth in Berlin from Dr. Seyffarth's lithographed alphabet (Seyffarth Gram. Ægypt, p. xliv.). I find, however, the complete syllabic theory in an article of M. de Rougé, published in the Revue Archéologique of 1848, where he speaks of "une classe très nombreuse de caractères, où le phonétisme se développe à divers degrés, tout en conservant au groupe le fond de sa nature primitive qui est idéographique. Champollion en a parfaitement saisi la nature générale, et transcrit presque toujours ces groupes avec une grande sagacité. On doit néanmoins à M. Lepsius d'avoir formulé plus nettement les divers degrés du phonétisme. Ce savant reconnaît, 1° un alphabet très restreint composé de caractères *purement phonétiques* ou *simples lettres* 2° des caractères *syllabiques* c'est à dire valant une syllabe complète, soit que la seconde lettre soit exprimée, soit qu'elle soit restée sous-entendue. C'est ainsi que Champollion donne

recognized by Champollion, and though his hypothesis of abbreviation was not the best explanation imaginable, it was at least perfectly consistent with facts, and by no means liable to the objection raised against it by his adversaries. If, indeed, the letters M or N might be arbitrarily taken as the initials of any syllable or word beginning with those letters, the widest scope would be open to the caprices of fancy; but Champollion was far from allowing anything of the kind. One particular form of the letter M he considered as an abbreviation of the syllable Mes, and of that only. Another M he considered as the abbreviation of the syllable Men, and of no other syllable or word; and so on for the rest. And were it not for the principle of double orthography, Champollion's explanation would be the simplest and the true one.

Before proceeding farther it is necessary to say a few words in explanation of the mode of transcription of Egyptian into Roman characters, which has been adopted in this article, after the examples of de Rougé and Brugsch. The capital letters represent the hieroglyphs, the smaller letters stand for the vowels which are necessary for their pronunciation. These are sometimes adopted from Coptic analogies, but are often purely conventional. The hieroglyphic, like the so-called Semitic alphabets, contained no vowels properly speaking. These alphabets contained letters which had, indeed, strong affinities with certain vowel sounds, but were perfectly capable, under other conditions, of coalescing with other sounds. Thus in the Syriac transcriptions $\omega\epsilon\lambda\mu\kappa\iota\gamma\alpha\lambda$, $\omega\alpha\lambda\mu\epsilon\lambda$, the vowel letters correspond to those of *'Αντίχριστος* and *'Αψινθος*, but the first of these letters stands equally for the *e* in Erastus, the *o* in Onesimus, and the first *i* in Ignatius. It is the initial letter in combination with another in such words as Israel, Urischlem (Jerusalem), Urbanus. In the word $\imath\|\|$ (air) where it occurs twice, and which is pronounced *o-yar*, the same letter represents three different sounds.⁸ In like manner the same

Mode of
transcription
adopted.

très exactement la valeur mh au caractère", etc. Vol. v., p. 326. But quoting a few lines from such an article is almost like producing a brick to give a notion of a house. Any unprejudiced person will read the same doctrine in another article by the same author in vol. iv. p. 490 of the same publication.

⁸ In the following sentence from the "Arabian Nights", the vowel letters correspond almost accurately with the real vowels as pronounced in the vulgar language (the initial Elif being read *e* or *i*); but it would not be easy to find whole sentences like it in the same page, or even in the same tale.

hieroglyphic sign is found in well known proper names to stand for a, e, i, ai, and o. The hieroglyphs, therefore, which are transcribed A, I, and U must not be supposed to have a more decided vowel character than the *quiescible* letters of the Hebrew or the *weak* letters of the Arabic alphabet.⁹ This, of course, did not prevent the language from being rich in vowel sounds.¹⁰

The hieroglyph transcribed T'¹¹ corresponds to the Coptic χ , the sound of which approximates to that of the English J. Mr. Birch transcribes it by a G; but this transcription is open to grave objections, not only on account of the many different sounds of the letter G in our modern languages, but because the affinities of that letter are quite different from those which enable us to identify $\chi\Delta\Omega\text{H}$ with *Tánis* and $\eta\zeta$, $\chi\epsilon\epsilon\eta\eta\text{O}\text{U}\text{T}$ with *سینود* and perhaps *Σεβέννυτις*, the hieroglyphic T'AR with $\eta\zeta$, Tyre (Coptic $\epsilon\omega\rho$); T'ARePTA with $\eta\zeta\text{P}\text{T}$; CheSBeT' with CheSBeT (*lapis lazuli*); T'IToS with Titus; and T'oMATIANoS with Domitian.

It will be observed that one hieroglyph represents the letters L and R, which at all periods of the language have been closely allied. The same proper name in Coptic is written $\kappa\text{O}\rho\eta\eta\lambda\iota\text{O}\varsigma$ and $\kappa\text{O}\rho\eta\eta\rho\iota\text{O}\varsigma$, and the Bashmuri dialect regularly changes the R into L. $\lambda\epsilon\eta$, $\lambda\epsilon\tau\eta$,

يا ولدى اعلم ان الدنيا دار فنا والاخرة داو بقا

Yâ uldy ilem en ed-denyâ dâr fenâ u'l-achira dâr beqâ.

"My child, know that the world is a perishable abode,

"And the world to come an everlasting one".

⁹ "Le manuscrit démotique à transcriptions grecques, conservé au musée de Leyde, prouve que le vague des voyelles a persisté jusque dans les derniers monumens des écritures égyptiennes. On remarque, dans ces transcriptions que le caractère vague était encore plus complet que dans l'alphabet hébreu. Non seulement le signe de l'i s'employait pour les sons ϵ , η , mais encore la voyelle *ou* servait à transcrire dans les mots grecs les sons *ou*, *o*, ω , ϵ , η ". De Rougé—Tombeau d'Ahmes, p. 13. Compare Lepsius Lettre à Rosellini, p. 37. Königsbuch, i., p. 176.

¹⁰ *E. g.*, proper names like IUAA, A-U-A-U-IT and BUIUOAA. In the Coptic language accumulation of vowels is frequent. *E. g.* $\Delta\text{O}\text{U}\text{I}\Delta\text{O}\text{U}\Delta\eta$, $\text{O}\text{U}\text{E}\text{I}\Delta\Delta\tau$, $\epsilon\epsilon\text{I}\epsilon\text{I}\text{O}\tau\lambda$, $\epsilon\tau\text{O}\tau\eta\text{O}\tau$, $\mu\text{O}\text{U}\text{E}\text{I}\text{O}\text{O}\tau\epsilon$.

¹¹ Lepsius transcribes this sign and its homophones by an ordinary T, though he is far from denying the results of its identification with the χ . He cites, for instance, the hieroglyphic group T'aTBI, which corresponds to the Coptic $\chi\Delta\tau\beta\epsilon$. See the "Königsbuch", pp. 170-175.



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Alphabet

I	U	B	P	F	M	N	R	T	T'	K	Ch	Sch	S

HIC TEXT IN PLATE I.

	16	AU HeN Is the phallus	27
Tatu.	18	AU ChePeT Is the thigh	29
Sais.	20	AU MeN-RATti Are the legs	31
	22	AU RaT-(ti) Are the feet	33
hoth.	24	AU A-T-U Are the hands	35
	26	AU AK-U AB-U Are the fingers and nails	37

C
eN HeSARi AUFANCh-A MACHeRu Mes eN SITMiN MACHeRu,
of Osiris Autanch the Justified, born of Sitmin the Justified,

eM HeSARi

(that) of Osiris.

eM ARi(T) HoR

(that) of Ari-hor.

eM NuT

(those) of Nut.

eM PTaH

(those) of Ptah.

eM HaRScheF

(those) of Arsaphes.

eM ARA-U ANCh-U

(those) of the living Uraeus divinit

partment. The copula precedes the subject of the proposition. The first sentence i
All the other sentences are formed on the same model.

should have the shape }.



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and goddesses. In the group last referred to we have a word written with six signs, of which the three first are purely phonetic, and the three last purely ideographic. But no mistake can possibly be made as to the reading of the group, there being nothing arbitrary in the principles of its decipherment. Yet a most learned and accomplished scholar, Mr. George Long,¹³ has declared that if the hieroglyphic mode of writing be a complex system, the same text, the same phrase, and perhaps the same word, containing phonetic, symbolical, and figurative elements, no man in his senses will ever trouble himself about deciphering an hieroglyphic text. A person ignorant of mathematics might, with equal plausibility, speak of the absurdity of trying to solve an equation involving three unknown quantities. Hieroglyphic writings are deciphered, as equations are solved, by the observation of fixed rules.

If we turn to the *odd* columns containing the names of the limbs, we shall find No. 3 terminated by a spiral character somewhat resembling the upper part of a note of interrogation. The same sign will be found in most of the columns marked with an odd number. It is the determinative of *limbs* in general. In this series of columns we again find several groups to which more than one determinative is attached. The ears, for instance, MeSaT'eR (7) have first the general determinative of limbs, then the ideographic representation of the ears. Some of the groups like (1), are without the general determinative, and have a special one.

Three small vertical strokes will be observed at the end of 13, and other columns. These indicate the plural, and are pronounced U. Sometimes the hieroglyphic signs of this vowel letter are expressed, before the three strokes, as in the example referred to.

Variants.

As very many copies of the Ritual are extant, it might have been expected with certainty beforehand, that many different readings would be discovered. Those of our text, which are noted in Plate I., are extremely far from exhausting the list which might be drawn up. I have selected a few for the purpose of illustrating the hieroglyphic mode of writing in general, not our text in particular.

On comparing together copies of the same text, dif-

before it for the number four. These are really cases of phonetic characters used ideographically.

¹³ "Egyptian Antiquities of the British Museum", vol. ii., p. 361.

ferent readings are invariably found. These different readings are often of the same kind as the "variæ lectiones" in other languages; but they often arise from the facility with which, according to the hieroglyphic method, the same word might be written with different, but equivalent signs. In one MS. a word is written with phonetic characters at full length, in another it is found written with merely ideographic signs.

In our text, for instance, which represents that of the great papyrus in Turin, the Lips (in Coptic CΠOΤΟΥ) are represented in column (11) ideographically; but another MS. gives the variant *d* with the word SPOTI in purely alphabetic characters, followed by the ideograph of Lips as a determinative. On the other hand, our text (13) writes ABHU (*teeth*, compare Coptic OϞϞE) in full letters, where another MS. (variant *e*) gives merely the ideographic sign expressive of Teeth, with the sign of the plural. There are different ways of expressing the plural. We have already spoken of the three vertical strokes either with or without the vowel letter U. Another method which chiefly affects ideographic characters is the repetition of a sign three times. Examples of these different ways may be seen on comparing the variant *f* with its equivalent in column (8), or the variant *m* with the corresponding group in column (38).

The immense importance of these variants in determining the value of unknown signs was pointed out by Champollion, who could not but notice that the very first words deciphered, such as Ptolemy, Cleopatra, and Berenice, were written in different ways, and that values discovered by a comparison of these variants led to fresh discoveries, or at least confirmed results derived from other methods of inquiry. Thus by comparing the two variants (39) and (40), in (Plate II.) of the word Sebastos, the former being found as a title of Antoninus Pius at Medinet Abu, and the latter in that of Domitian on the Pamphilian obelisk in the Piazza Navona, we find that the Child was, at least at that period, used as an equivalent of the letter S, and the Ram as that of the sign which was discovered to have the sound of B in Berenice. The Egg, which stands for the second S in (39), is shown by (40) to be simply equivalent to the first S. The greatest circumspection is required in the application of a method so fruitful in results, but I shall have frequent occasions to recur to the subject. It is sufficient for the present to

observe, first, that is extremely hazardous to identify variants of different periods, those, for instance, of the early monarchy with those of the Ptolemaic or of the Roman times; and secondly, that the Rituals are full of blunders, and therefore give rise to a vast number of apparent variants, from which only erroneous conclusions can be drawn.

Let us now proceed to a closer inspection of the text, beginning with the horizontal line A. We shall then proceed to the columns containing the names of the limbs, and conclude with those containing the names of the gods.

Line A.

Line A.

eN HeS-ARi AUFANCh-A MA-CheRU, MES eN SiT-MiN MA-CheRU.
of Osiris Aufanch the justified, born of Sitmin the justified (lady).

The first group HeS-ARi is surmounted by the straight line which in cursive writing has the alphabetic value N, and which corresponds to the Coptic particle π (pronounced *en*), which indicates the genitive or dative cases.

The group HeS-ARi consists of three signs, the Eye, the Chair, and the Hatchet. Of these the Hatchet is merely a determinative placed after the names of gods. It might be left out, and often is left out, without affecting the sense or sound of the group; and on the other hand it might everywhere be substituted for the sitting figure which is found after most of the divinities of our text. In the column (28), which belongs to Osiris, both the Hatchet and sitting figure appear as determinatives, and in a passage of the Ritual engraved in our Plate II. (58) the sitting figure is substituted for the Hatchet. The meaning of this sign was discovered from the many places where it occurs in the Rosetta Inscription. Wherever the Greek speaks of gods, as οἱ θεοί, τῶν θεῶν σωτήρων, θεοῦ ἐπιφανοῦς, τοῖς ἄλλοις θεοῖς, we are sure to find the Hatchet. When *by itself* it has the phonetic value NeTeR or Nuter, and its phonetic complements T and R are often expressed, as in column (16). This is even sometimes the case with the initial N. NuTeR is no doubt the ancient form of the Coptic $\pi\omicron\tau\tau\epsilon$, the final *r* having been dropped in this case as in very many others.

Of the other two signs, the Chair is pronounced HeS, and the Eye ARi, both being ideographic signs used phonetically. Their values are determined as follows.

That of the Eye is discovered by its phonetic complements. It is very frequently accompanied by the Reed [= A] as its initial, and no less frequently by the alpha:



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hardly have been perceptible. In Phœnician transcriptions¹⁹ this aspiration is represented by an Aleph, as in the names אֶסֶר-שֹׁמֵר (quem Osiris custodit), עֲבַד-אֶסֶר (Osiridis cultor), and מֶלֶךְ-אֶסֶר. In one inscription the name of Osiris is written אֹסִירִי.

I do not believe that any of the hieroglyphic authorities produced by M. Brugsch²⁰ in favour of the value S are inconsistent with the value HeS as I have explained it. If the proper name *Herbes* be transcribed הֶרְבֵּס, as it certainly may be, it will be consistent with both hypotheses. A similar test may be applied to the variants of the name of the goddess Bast. Brugsch's real difficulty in accepting the value HeS lies in his recognizing only a strong aspiration for the hieroglyphic H. Yet his own view as to the identity of sound between this hieroglyph and the Hebrew ה would lead to a different opinion. A word which is written הֶמֶן (multitude) in the 51st chapter of the prophet Jeremias is written אֶמֶן in the very next chapter,²¹ and the greatest Orientalists,²² as Brugsch would readily allow, are agreed as to the close affinity between the weak gutturals and the facility with which they interchange. Coptic transcriptions lead to no other result. The name of HaT-HoR was written Δεωρ, of which ε&εωρ is the Theban form, and the Greek Παθυριτης is a far stronger authority as to the aspiration of "Aθυρ than the *Phathyrites* of Pliny. No one argues from the Greek transcription, Φαμενώθ, of the hieroglyphic *P-amen-hotp*, that the first letter of Ammon should be strongly aspirated. If Brugsch be right²³ as to the hieroglyphic name HRUMeNT of Hermonthis, the EPMΩNΘ of the coin of Hadrian, it is no less true that the Coptic name of this city was ερμεοντ or ερμεονθ, whence the Arabic name ارمونت. As to Greek transcriptions, it yet remains to be proved that

¹⁹ In Gesenius: *Scripturæ linguæque Phœniciaë monumenta*.

²⁰ *Geographische Inschriften altägyptischer Denkmäler*, i. p. 27.

²¹ *Comp.*, Jer., 51, 16, with 52, 15.

²² "The gutturals are indeed consonants, but very weak ones, which give up all stronger pronunciation, and even easily suffer all their aspiration, and with it their peculiar power and whole sound, to disappear; all this may be seen in gradations from the weakest א to the strongest ה". Ewald: *Hebrew Gramm.*, p. 28, Eng. transl. "Universè hæ litteræ [א, ה, et ע] utpote pronuntiatione sibi admodum vicina, sæpissimè inter se permutatæ sunt". Gesenius *Lexicon Manuale*, p. 1, Ed. 1847.

²³ *Geographische Inschriften*, i. 193.

our predecessors were wrong in writing Ὠρος, Ἀρμαχίς, Ἀρόηρις, Ἀρσαφής, Ἀρσίησις, Ἀΰαρις with a soft breathing, as well as *Apis* and the *Ibis* (Coptic ϠΠ).²⁴ But even if we confine ourselves to hieroglyphic authorities, there is very strong evidence not only of affinity but of interchange between our H and the letter A.²⁵

Having thus fixed the values of the two signs, which together phonetically compose the name of Osiris, it is necessary to add that considerations of symmetry frequently led the hierogrammatists to place the sign ARi in such a way as to give it the appearance of preceding the sign HeS. In the more cursive texts, the hieratic and demotic, the right order is invariably observed. And this is the case in the hieroglyphic texts when the determinative is omitted. So well known a name, however, accompanied by its determinative, could not be mistaken. Yet such liberties, had they been much indulged in, would soon have rendered the language unreadable, from the confusion which would have resulted. Our two signs would naturally come together whenever we had to express the idea of "making an abode" (ARi HeS.) desolate, happy, splendid, etc., as the case might require. Thus on a stele in the British Museum we find the passage²⁶

Ha NTeF [?]-U ARi HeS-U NeB
Percussit ille malos, faciens domos omnes . . .

Where the two signs (the Eye and the Chair) appear together as in the name of Osiris in our text.

It has already been said, or at least implied, that the Egyptian name of Osiris (HeS-ARi) differs from that of Isis (HeS) only by the addition of the important word

²⁴ "Ϡ, respondet elemento π Hebræorum, vel h aspirato, quare Copti ut expriment spiritum asperum Græcorum scribunt ϠΟΠΛΟΠ, ϠΙΠΛ pro ὄπλον, ἵνα"—Peyron., Gram. Copt., p. 5. This is perfectly true, but it is not the whole truth. The Copts wrote ϠΙΡΗΠΗ, ϠΕΛΠΙΣ, ϠΙΚΩΠ, ϠΥΤΑΛΙΑ, (Italy), and ϠΙΔΟΥΑΕΑ. Mingarelli says, "Thebaidenses cum initio *cujus libet fere Græcæ vocis* a vocali incipientis præponant notam Ϡ, videntur hanc ipsam et pro tenui et pro denso spiritu habuisse". *Ægypt. Codd. Reliquiæ*, p. xviii.

²⁵ De Rougé, *Étude sur une stèle Égyptienne*, p. 39-40: "En tout cas il y a quelques exemples du changement de la voyelle A initiale contre l'aspiration H".

²⁶ See Plate II. (43). The passage occurs in the second line of the tablet of Semneh, No. 138, published by Mr. Birch in the *Archæologia*, xxxiv., pl. xxviii.

ARi, which has the signification *make*, but by its position in composition, at the end of a word, is determined as a passive verb or participle. In its passive sense, it signifies *to be born* (as well as *made*), and is constantly used in this sense in the genealogies as a synonym of the word MeS. Throughout the Turin Ritual, Aufanch is said indifferently to be MeS eN SiT-MiN or ARi eN SiTMiN, *born of Setmin*. HeSARi, therefore, signifies “born of Isis”, just as Ptah-mes, Thuth-mes, Amen-mes signify born of Ptah, Thoth, and Ammon.

Etymology seems here to be at fault, or at least in contradiction with mythology, which represents Osiris and Isis as husband and wife, and at the same time brother and sister, both of them being children of Seb and Nut. Innumerable texts might be cited in favour of this relationship. Osiris is called²⁷—

UeR eN NeTeR-U 5 SchAA eN TeF-eF SeB
Eldest of the 5 Gods the children of his father Seb.

He is²⁸

Si NuT UT SeB—the son of Nut, engendered of Seb.

In another inscription he is said to be²⁹

API eN CheT NuT
First from the womb of Nut.

These words occur in a fourth text, which says of Osiris that he is³⁰

Aa eR TeF-eF T'eSeR eR MuT-eF
Great(er) than his father (more) powerful than his mother.

A fifth text³¹ says—

Ha HeSARi MeSTu-K MuT-ek NuT eN T'AM
O Osiris! genuit te mater tua Nut in Thebis.

Texts like these might be multiplied *ad libitum*; others, however, are not wanting, which imply a different relationship. In one of the legends³² of Isis, engraved in Wilkinson's Pantheon, Osiris is called the *father* of Isis.

²⁷ Plate II. (44).

²⁸ Wilkinson, *Ancient Egyptians*, 2nd Series, vol. III., Pl. 33.

²⁹ Plate II. (45) Champollion Gram., p. 241.

³⁰ Sharpe, *Egyptian Inscriptions*, 1st Series, Pl. 97. This passage has been cited by M. Chabas, in his most interesting papers in the *Rev. Archéologique* of 1857.

³¹ Champollion Gram., p. 195.

³² *Ancient Egyptians*, 2nd Series, vol. III., Pl. 34-1.



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the instrument, and in which she appears from various texts to have been assisted by other divinities.

The right meaning of the word Osiris had been guessed at before the discovery of hieroglyphic decipherment, but, as may be imagined, through the medium of false etymologies.

One of the ancient etymologies is worth noticing; because, unlike most Greek speculations of the kind, it exhibits some knowledge of the Egyptian language. It is that in Diodorus Siculus, according to which Osiris signifies "many-eyed". Plutarch explains this, saying that ος means "many", and ιρι "eye". According to another etymology, no doubt suggested by that in Plutarch, the word signifies "much labouring", from ιρι in the sense of "facere". Now the Coptic word οϣ, which would in Greek be transcribed ος, certainly means "many". οϣ, ρϣ, ρϣΔΙ, ρϣΕ, ωϣ (with all of which ϣΔΙ to multiply, ϣΕ a hundred, ϣΟ a thousand, ρΔϣΕ many, are akin), are expressive of multitude. The Egyptians however, did not say "multi oculi", but "oculi multi"; if, therefore, the latter portion of a compound word be a substantive, the former is not an adjective, but another substantive or an active verb. The objection is a strong one, but, perhaps, not decisive, and as to the second etymology referred to, it would seem that the word ρϣιρι really exists in the sense of "multum facere". Both etymologies, however, labour under two fatal objections. In the first place, the consonant ϣ, which is the all-important letter in the Coptic words signifying multitude, and which has more than one hieroglyphic equivalent, is not

said, NeM-MeSTeF eM AP, "He was born again in Ap." (Brugsch Geog. Insch. I. p. 214. He is called NeM-MeS eN CheMMIN. "The born again of the Sanctuary of Min". Amenemha, the first king of the 12th dynasty, who lived some centuries before the Exodus, called himself, in his royal titles, HoR NeM-MeSUT, "Horus, the born-again". The sign (a bull's leg) here read NeM, according to M. de Rougé, is read UHM by Dr. Brugsch, and with the latter reading it would give us the hieroglyphic form of the Coptic ΟΥ&ϩϩΙϩΙ (regeneration) of the Christian Ritual. However, whatever difference there may be about the reading, there can be none as to the meaning of the sign, which is as ideographic as our numeral 2. It is used in another expression applied to the state of gods and men declared just--NeM ANCH "a second life". Another sign, the Palm, has the value UAH, which corresponds to the Coptic ΟΥ&ϩ, and it is found as a synonym of NeM in the royal title UAH-ANCH HoR NuB of Amenemha III. of the 12th dynasty.

represented in the hieroglyphic orthography of Isis or Osiris. The *s* in these names is written with signs which are not interchangeable with ω . I may add, that in the Phœnician transcriptions this *s* is written with a *Samech*, and never with a *Schin*. Secondly, both derivations ignore the important fact, that in their natural orthography the names of the two Egyptian divinities are as closely and visibly allied as those of Atreus and Atrides, or Clarence and Fitz-Clarence.

I hope that by this time the hieroglyphic name and etymology of Osiris have become tolerably clear. It must now be noted that the Osiris of our text is no other than the deceased person for whom the papyrus was written, all the good being supposed to *become* Osiris after death. The identification was of the strictest kind. It went so far as to ascribe to the deceased all the actions, sufferings, and relations of Osiris. The inscription on the cover³⁶ of the sarcophagus of one of the most ancient kings of Egypt, the Mycerinus of Herodotus, begins as follows:—

HeSARi	SuTeN	CheB	MeNKA-U-RA	ANCh	T'eTa	MeS	eN	PeT	Sche-
Osiris,	King		Mycerinus	living for eVer,	Born from	heaven,	son		
Re NuT	AA	eN	SeB	MeR	PeSSche-S		MuT-eK	NuT	
of Nut,	substance	of	Seb, beloved;	spreads (her wings)			thy mother	NuT	
HeR-K.									

over thee, etc.

The same formula continued, with all sorts of variations, to be used on funeral monuments down to the latest periods. Sometimes, for instance, the deceased invokes his mother Nut to extend herself over him, and this action is frequently represented. All the gods of the family of Seb, and, indeed, the gods in general, treat the departed as if he were the only Osiris that ever existed. Anubis takes charge of the body, Isis and Nephtys utter their lamentations over their brother, and recite the charms which will restore it to a new life. Thoth justifies the departed against all his enemies. In a funeral text, translated by M. de Rougé, the genius Hapi, son of Osiris, addresses the departed as follows:³⁷—

“Ego *filius tuus* adsum pro salute tuâ, impleo artus tuos vitâ. Suscito germen in cadavere tuo ut sanetur, non discedam a te in æternum”. And in another, from the Ritual (chap. 51) Isis says—“Venio per auras, adsum ut

³⁶ Now in the British Museum.

³⁷ Etude sur une stèle, pp. 116 and 127.

fiam tibi animus; do halitus naso tuo, spiritus emissos a deo Tum”.

Identification with Osiris was no privilege of the male sex. A considerable number of texts prove that females and males went through precisely the same process in the next life. The old translation “Osirien”, “Osirienne” instead of “Osiris”, for a long time obscured this fact. The sacred Bulls Apis and Mnevis also became Osiris after death. Serapis is only a corruption of HeSAR-HAPI.

In the name AUFANCh-A which follows, all the signs are alphabetic except the fourth (the Crux Ansata) which has the worth of the syllable *Anch*, corresponding to the Coptic $\text{ON}\text{ϩ}$ *Life*, of which it is the symbol. It is followed by the alphabetic signs N and Ch which are its phonetic complements. They might be suppressed without changing the reading of the word. The syllabic worth of the Crux Ansata was perfectly known to Champollion. He indeed says³⁸ that it seems to have been pronounced ω or o , but he immediately adds, “It is perhaps only the *habitual abbreviation* of . . . $\text{WN}\text{ϩ}$, $\text{WN}\text{ϩ}$, *living*”. And he never reads it otherwise when, as in the name read by him *Onkarsiesi*, the phonetic complements are suppressed.

Vowel letters written at the end, but pronounced in the middle of a syllable.

It is doubtful whether the A written at the end of the word should be pronounced there or in the previous syllable. One of the most remarkable peculiarities of the Egyptian writing, and which is found in the demotic and hieratic, as well as in the hieroglyphic, is the constant habit of placing at the end of a syllable vowel letters which seem to have been pronounced in the middle of it. Lepsius³⁹ gives nineteen examples of this strange custom, and the number might be indefinitely increased. He accounts for it by the syllabic nature of the primitive writing. If *one* sign only, for instance, be used to express the syllable of which M and S are the extreme consonants, *mas*, *mis*, and *mus*, could only be written by placing the vowel letter either before or after the sign, and the Egyptians seem to have adopted the latter alternative.

³⁸ Dictionnaire, p. 329.

³⁹ Lettre à Rosellini, p. 40. He says “Je ne connais rien d’analogue dans aucune autre écriture”. In such English words as *table*, *nitre*, the final vowel is pronounced before the last consonant. There is no real analogy between this and the Egyptian practice referred to, but it may help one to conceive how the Egyptians might pronounce *seb* or *mus*, words written *sbe* or *msu*. But in English the dislocation is in the pronunciation, in Egyptian it is in the writing.



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tic (whence the Blessed Virgin's title $\omega\alpha\kappa\nu\omicron\upsilon\tau\uparrow = \theta\epsilon\omicron\tau\acute{o}\kappa\omicron\varsigma$ is derived), may, like all other roots, have an active or passive signification, according to its position. Here there can be no doubt as to its meaning, as it is connected with the next noun by the particle eN. MeS eN SiTMin is "born of Sitmin".

SiT(MiN?)—About the first part of this proper name there can be no difficulty. It consists of the following signs:—First, the figure of a child holding his finger to his mouth, and accompanied by two small signs, one on each side; then an Egyptian standard, surmounted by a sign like an alphabetic S; lastly, a flower. This Flower is a determinative of female names. Female names are frequently followed by the sign of a Woman sitting and holding a flower. It will often be found in the Todtenbuch after the name of Setmin, the mother of Aufanch, and of this sign the Flower seems to be an abbreviation.

The two signs which appear, one on each side of the child, are, from their diminutive size, not easily made out in our text; but wherever the name is written in larger characters, as on the title of the second page of the Todtenbuch, it is easy to see that the upper one is an Egg, and the lower one the segment (=T).

We have already seen how in the word Sebastos the Egg has the value of S. Many other proofs of this value might be given from Roman names, but it is more important to remark that in earlier times the Egg is very frequently found as the equivalent of the Goose, as ideographic of the notion *Child*, and with the same phonetic value. It is put for the Goose, in the common royal title Si Ra, Son of the Sun, and a comparison of the variants of Si eN Si, *a grandson*, *Plate II.* (46), will show how the two signs interchange. The Egg is employed phonetically in the royal name Si-Ptah, and in the divine name Hor-Si-Hese, *Plate II.* (48). One of the most curious cases of the use of this sign is found in a variant of the name of the city *Sais*, *Plate II.* (47).

The sign *Child*, we have also seen, has the value S in Sebastos. On the obelisk of Benevento it is the last letter in the name of Domitianus. And it is found as the equivalent of the Goose or the Egg in the name HoR-Si-HeSe, and a multitude of other names. Its principal function, however, is ideographic, and in the earlier monuments, it is only when it stands by itself, or begins a syllable, that a phonetic value is to be attached to it. Thus in such names

as that of the king P*Si*MuT⁴⁴ of the 23rd dynasty, or of the princes Ta*Si*HeSeT⁴⁵ of the 24th, the Child is used phonetically, but in such others as P*Sche*ReNHaTHoR⁴⁶ or P*Sche*ReNPTaH,⁴⁷ it is only the determinative of the word *Sche*Re (Coptic *ⲙⲉⲣⲉ*) a child. On the stele of Pscherenptah two royal shields are found belonging to Ptolemy surnamed *Νέος Διόνυσος*. This surname is hieroglyphically⁴⁸ expressed in one of the shields by the words HeSARi HuN, the *Child* appearing as the determinative of the latter word. In the second shield the Child simply takes the place of the second word, and has a phonetic value equivalent to it. In the so-called Negative Confession, one of the most important parts of the Ritual, the deceased says in one of the clauses.⁴⁹

AN NeHeM ART eM Re eN NeCheN-U
I have not taken away milk from the mouth of the sucklings.

The Child is used here as the determinative of the word written in full letters NeCheN. But in some MSS. of the Ritual the phonetic characters disappear, and are simply replaced by the Child, which thus acquires another pho- Poly-
phone
signs.
netic value. Here, then, we have an example of what M. de Rougé and other scholars call “polyphonie”, a totally different thing in their hands from what I have argued against as characterizing Dr. Seyffarth’s system, viz., the admission in a purely phonetic system of a large number of signs, each having perhaps half a dozen different values.

All ideographic writing is from its very nature equivocal. The same picture would to English observers suggest different words as expressing its nature. “Babe”, “infant”, “suckling”, “child”, “little boy”, etc., each of these words might *à priori* be equally appropriate, and the choice of any one of them to the exclusion of the other, must be determined by definite circumstances. The same truth holds in hieroglyphic decipherment. It is from positive evidence alone that we know that the sign Child must be read *Si* in one place, *Nechen* in another, and that other values must elsewhere be given to it. And when such evidence fails, we must simply despair of reading the

⁴⁴ Plate II. (50).

⁴⁵ Plate II. (51).

⁴⁶ Plate II. (52).

⁴⁷ Plate II. (53).

⁴⁸ Plate II. (54). From M. Prisse’s *Monuments Egyptiens*, pl. 26.

⁴⁹ Plate II. (55). From *Todtenbuch*, c. 125-9. Compare a variant in Champollion’s *Dictionary*, p. 185.

word in which such a sign occurs. We can only guess at it according to the probabilities of the case. Let it not, however, be supposed that the progress of hieroglyphic decipherment is much impeded by difficulties of this kind. They are comparatively few, and the absence of evidence on some points is but like a feather in the scale, when weighed against the mass of evidence on so many other points. Besides, as the progress of decipherment advances, difficulties resulting from polyphone signs tend necessarily to disappear altogether. And, after all, it must not be forgotten that the meaning of an ideographic sign may be perfectly certain even when its reading is doubtful. Whatever be the reading of the sign Child, we can never be wrong in translating it *child*, though when it occurs in a proper name, we may be at a loss for the corresponding Egyptian word. The students of hieroglyphic writing are in this respect in a far more advantageous position than the students of cuneatic writing, in which polyphone values must be ascribed to a large number of ideographic signs, which have retained no trace, if they ever had it, of a pictorial character.

In the name SiT-MiN, the Child is used ideographically after the Egg, as expressing the same notion, just as in our variant, Plate II. (49), the Egg is used after the Child in the name HoR-Si-HeSe. Or we may choose to consider these *second* characters as used phonetically as well as the first, and in this case they would furnish us with instances of double orthography. In certain parts of the Todtenbuch (*e.g.* in our text, line B) the name of Setmin is written without the Egg, and in such cases the Child has, of course, the value Si, but the omission of the Egg may sometimes be owing to its having been effaced by time from the original papyrus. The small sign under the Child is the segment with its ordinary alphabetic value. We, therefore, read the first part of the name SiT (that is, daughter), the letter T added to nouns making them feminine. Sit-min signifies the daughter of Min. Sometimes the T is left out where we might expect it, as in the corresponding place of line B, if its omission there be not the result of mistake or obliteration. But that is because ideographic signs, like the Child or the Egg, express the feminine as well as the masculine of the idea.

The next sign which I follow Dr. Brugsch in reading MiN, is the Standard with the sign like the hieroglyphic S. Every one allows it to be the name of the god repre-



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Although these passages identify the god with Horus, they throw no light upon his name. M. de Rougé tells us⁵³ that both names, Ammon and Horus, are often found at the same time on representations of this deity: they are, however, but predicates of *x*.

The reading *Chem* is suggested by a comparison of several passages in the Greek writers about Panopolis and its divinity.⁵⁴ Stephen of Byzantium thus speaks of the representation of the god of Panopolis: “Ἔστι δὲ καὶ τοῦ θεοῦ ἄγαλμα μέγα ὠρθιακὸς τὸ αἰδοῖον εἰς ἑπτὰ δακτύλους, ἐπαίρει τε μάστιγας τῇ δεξιᾷ Σελήνην, ἧς εἶδωλον φασιν εἶναι τὸν Πᾶνα”. This is evidently the divinity in question, who is here identified with the Greek Pan. We are, moreover, told that *Χέμμης* (or *Χεμμώ*) being interpreted, signifies *Πανὸς πόλις*.⁵⁵ And a hieroglyphic group is found, consisting of the alphabetic signs Ch, M, followed by the sign *x* (which may thus be represented as the ideograph of the word *Chem*), and the determinative of a city. This group might plausibly be read as “the City of Khem”, *i.e.*, Panopolis.

Dr. Brugsch, however, positively assures us that in Greek transcriptions the sign *x* is universally, and without exception, rendered by the syllable *μιν*, as in the names *Φαμινίς*, *Σεμμινίς*, and *Ζμινίς*. He appeals to hieroglyphic variants in which the letters MN are substituted for *x*, and he refers to a passage in Plutarch's treatise *de Is. et Os.* (c. 56), which, according to its last editor, Dr. Parthey, says, τὸν μὲν Ὀρον εἰώθασιν καὶ Μῖν προσαγορεύειν. And, by reading the hieroglyphic name of Panopolis, just mentioned, *CheM-MiN*, he obtains the sense “Sanctuary of Min”.

The value *MiN*, proposed by Dr. Brugsch, is thus quite as consistent with the Greek authorities which suggested

Ar *T'at'a-u aa.t am u Ab Hesari Hese Nebthi Ap-heru pu* (Todtenbuch, c. 18. 7)

2. “The mighty chiefs dwelling in An are Tum, Su, Tefnet”.

Ar *T'at'a.u aa.t am.u An Tum pu Su pu Tefnet pu.* (Ib. 18. 3).

3. “The mighty chiefs dwelling in Sechem are Horus of Sechem (and) Thoth, who (is) of the princes of Narotf”.

Ar *T'at'au aa.t am.u Sechem Hor pu am Sechem Tut pu nti em T'at'a.u Narotf* (Ib. 18. 18).

⁵³ Notice Sommaire des monuments Egyptiens du Musée du Louvre, p. 102.

⁵⁴ Brugsch, Geographische Inschriften I. p. 212.

⁵⁵ The Coptic name of Panopolis is *Ⲭⲉⲙⲓⲛ*, *Ⲯⲉⲙⲓⲛ* or *ⲡⲁⲛⲟⲥⲮⲉⲙⲓⲛ*.

Chem as that value, if not more so, and it has the advantage of being directly founded upon hieroglyphic, and, if I rightly understand him,⁵⁶ bilingual authorities. I should have no doubt whatever on the subject, were it not that Lepsius, who is fully acquainted with all the existing evidence, still hesitates to accept the value which Dr. Brugsch proposed about ten years ago. But unless Brugsch is mistaken in his facts, the evidence (as far as published) is strongly on his side.

The name Sit-min (daughter of Min) is female, which may appear strange to those who are not aware that when the Egyptians did not mention the names of both father and mother in a person's pedigree, the mother was named in preference to the father.

The name of Sitmin is followed, like that of her son, by the epithet MA-CheRU.

The lines B and C repeat exactly the same words as those in line A. The first part of the name Aufanch has been obliterated in B. We have already seen the variants of the word MA-CheRu, which these lines contain. On comparing the name Aufancha in lines A and C, it will be observed that two different forms of U are employed. The final A of this name is replaced in line C (and also in B) by a human figure, seated and holding up an arm as if gesticulating. This latter sign, which is ideographic, is frequently used as a determinative of men; but it is also used phonetically, and interchanges with A in pronominal affixes.

Lines B and C.

We now come to the vertical columns, beginning with those marked with an odd number. All of them begin with the copula A-U, ("is" or "are"), which precedes the subject of each proposition in our text; and that whether the subject be singular or plural. The Coptic ερε is used in the same way, e.g., ερε πεκβαλ επονηρος, *est oculus tuus nequam*, ερε ζητοϝ εεζ *sunt eorum facies plenæ*. The corresponding word in Coptic seems, however, to be OI, or the Theban O. By the addition of suffixes characteristic of the different persons, AU can be made to have the appearance of conjugation. Thus—

Vertical columns.

The Copula AU

	AU-A	eM	ScheRA				<i>Eram ego puer.</i>
	AU-K		UBeN				<i>Tu es purus.</i>
	AU-S...	KeN-T	HeR MU				<i>Illa est carens aquâ.</i>
AU-TeN	eM	BeS-e	A.T	NeB	NTI	AU-F	EM- S. Literally.
<i>Estote</i>	<i>in</i>	<i>salutem</i>	<i>domus</i>	<i>omnis</i>	<i>[in]</i>	<i>quâ</i>	<i>erit ille in illâ.</i>

⁵⁶ Cf. Brugsch's Uebersichtliche Erklärung ægyptischer Denkmäler des k. neuen Museums zu Berlin, p. 82.

The “substantive” verb is also expressed in the old Egyptian by other words, as eR and UN (Copt. OYON). I have already, in a note, given examples of AR PU. Sometimes PU, which is originally a pronoun, is used by itself as a copula, without undergoing change for number, gender, or person,⁵⁷ as in the sentence—

TeChA-K PU BeChTeN HeN-UK PU ReT-F NoK PU HeN-K
urbs tua est Bachtan, servi tui sunt populi ejus, ego sum servus tuus.

To illustrate the various uses of these different forms would carry us beyond the scope of the present article. They are noticed here lest it should be supposed, from the analogy of some other language, that the form of copula used in our text was the only one known to the Egyptians. The logical combination of subject and predicate might also be implied without any expressed copula. As in Hebrew we may say $\text{שֶׁמֶן תִּירֶק שָׁפָה}$ *Unguentum effusum* [est] *nomen tuum*, so did the Egyptians say—

ANeR eN MA ReN-K
a Rock of truth [is] thy name.

In this sentence, it will be observed, that, as in Hebrew, the place of the predicate is before the subject.

Parts of
the body.

The first part of the body which is mentioned in our text is T'eN-NU (Coptic XANEN), the *hair*. This word is followed by a lock of hair, as the determinative. We have, I believe, no direct proof of the value of the first sign of the word, but M. de Rougé has shown that a certain number of hieroglyphic groups beginning with it correspond to Coptic words beginning with K , G , or X . This had already been noticed by Champollion. M. de Rougé has also shown that the N, which follows the sign in most of the places where it occurs, may be either left out or expressed, and is therefore merely the phonetic complement of a syllabic sign, which he reads T'eN, and identifies with a Coptic word signifying *flexure*. The only difficulty in accepting this value consists in the existence of a certain number of variants in which a sign having the undoubted value SeN, is interchanged with the one

⁵⁷ The Coptic NE is used exactly in the same way. Peyron says Gram. Copt. (p. 150) “ NE propriè construitur cum solo masculino singulari”, but is obliged to add “sed construitur etiam cum feminino, et plurali”. The hieroglyphic texts show that no distinction existed in the ancient times.



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an ideographic sign twice written expresses the dual, of which no corresponding grammatical form has been proved to exist.⁶² Two oblique signs in our group express the same notion. I read the group in our text ARi-U on the strength of the variant *a*, which is found in Champollion's Dictionary, p. 63, cited from one of the hieroglyphic Rituals in Paris.

(7) MeSaT'eR (= Coptic ⲙⲥⲁⲧⲉⲠ), *the Ears*. The only sign in this group of which nothing has been said as yet, is the third, which was identified by Champollion with the Coptic Ⲭ. The only apparent difficulty in accepting this value lies in its being found in one of the variants of the name Soter in a bilingual inscription in the British Museum, where it occupies the place of the *t*, and interchanges with the alphabetic hieroglyphs which represent that letter. This is, however, easily explained by the affinities of the Ⲭ, and the mania which led the scribes of that period to avail themselves of every possible means of writing the same name in an infinite variety of ways.⁶³ M. de Rougé has shown⁶⁴ that Champollion's reading is a correct one as far as it goes. The letter R, which constantly follows it, must, however, be considered as the phonetic complement of the syllable T'eR. The final *r* in the word MeSaT'eR has, like in a multitude of analogous cases, been dropped in the Coptic word derived from it. It had already dropped it in the demotic form MASTI.

⁶² Much may be said in favour of the final syllable Ti, but the arguments on the other side of the question are very strong. The two oblique lines are undoubtedly the letter I, but this may be ideographic like Ⲕ in Coptic as may be suspected from its frequent omission in variants. A good deal of uncertainty exists about the T also. I have generally included such doubtful forms within ().

⁶³ "Le cerceuil de Soter nous transporte dans cette époque désespérante pour l'étude ou les hierogrammates se plaisent à multiplier les *conceiti* et les variantes inutiles. Il semble que ce soit une gageure de leur part, tant ils montrent sous ce rapport une fécondité de mauvais goût. Ainsi le nom du dieu *Haké* est inscrit sur le temple d'Esné de plus de vingt manières différentes; l'inscription de Rosette elle-même nous montre le nom de l'Égypte rendu chaque fois par une nouvelle variante. Salvolini a bien montré comment on se permettait alors de donner aux caractères de nouvelles valeurs phonétiques, prises soit du sens propre, soit du sens figuré de chaque hiéroglyphe; il faut donc être extrêmement réservé dans l'usage que l'on peut faire de pareilles variantes en les appliquant au déchiffrement des anciens textes". De Rougé, *Rev. Arch.*, iv. p. 124.

⁶⁴ *Rev. Arch.*, ubi supra, p. 127. Tombeau d'Ahmes, p. 77.

(9) FeNT(I), *the Nose*. This group, written in phonetic characters, is followed by two determinatives, a calf's head, and the determinative of limbs in general. The calf's head is an ideographic sign, having the phonetic value FeNT, for which it is often substituted, as in the variant *c*.

The word FeNT, in the sense of *nose*, has disappeared in the Coptic. The hieroglyphic group, composed of the same phonetic signs, but followed by the figure of a worm, as determinative, corresponds to the Coptic ϣεπτ in Mark, ix. 47, "Where their *worm* dieth not".

(11) SPoT(I), *the Lips* (Copt. СПОТОУ). Here we have only the ideographic representation of the two lips, the determinative of limbs, and the sign of the dual. The phonetic value of the ideograph is ascertained from the variant *d*.

The word SPoT is remarkable for its similarity to the corresponding Semitic words שפה (dual שפתיים) (שפתיים, شفتين) (dual شفتين). It is used exactly like these words⁶⁵ in the derived sense of *brink, bank, shore*. It might be supposed that such an expression in the Coptic version of the Scriptures as πικυω ετδατεπ πεπсφотου ρεφιορρ (Heb., xi. 12), was a servile translation of τὸ χεῖλος τῆς θαλάσσης in the Greek; but, at all periods of the Egyptian language, "the lip of the sea" was used where we should say the "shore of the sea". In one of the hieroglyphic inscriptions found in Dr. Brugsch's work we have the words—

HaNeB-U eNTI HeR SPoT UaT'-UR
The Greeks, who [are] on the lip of the Mediterranean.

In this passage, the word SPoT is represented by the ideograph only; but in many other inscriptions, as, for instance, the Annals of Thutmes III., it is written in full letters, and accompanied by a determinative of locality.

(13) ABHU, *Teeth*, Coptic οβγε. This word is written with purely alphabetic characters, and followed first by the ideograph of Tooth (compare variant *d*), then by the three vertical strokes indicating the plural. As the word is very frequently found even in variants of this

⁶⁵ It might be objected that the *t*, in the Semitic words, is not radical [is it radical in Egyptian?]; but the question cannot be solved without going deeper into the matter than I can afford at present.

very passage, without the alphabetic U, it is not unnatural to take this for the plural form. Still it is not absolutely impossible that this U may represent a vowel sound really belonging to the singular, but habitually omitted, as in the name of ANP(u) Anubis, in col. (12) of our text.

(15) NaHBet, (Copt. ⲛⲁⲃⲉⲧ), *the Neck*. The first sign, a peculiar kind of bird, was, like its fellow, in variant *i*, taken by Champollion for the letter N. This value is undoubtedly true wherever it occurs, but it never occurs without the H. Dr. Hincks has well illustrated the use of the syllabic sign which occurs in several well-known groups; among others, one which he has identified with the name of the Biblical תִּמְנָה, Timnah.⁶⁶

(17) A-U(i), *the Arms*. We now come to several groups which are not so satisfactorily explained as those we have already seen. There is no doubt that the group in col (17) signifies *arms*, and that these are ideographically represented.⁶⁷ But when the arm is an ideograph, how is it to be read? Probably not with its alphabetic value, but with that of some group of which it is found as the determinative. It is found as that of the group KAHU, a word the presence of which can be traced in the compound ΚΕΛΕΝΚΕΖ (the elbow), literally, the bend of the arm. Thus, in the description of a vignette, in the Ritual, we read of one of the figures⁶⁸ that—

AU HRa eN ScheFT HeR KAHU-F AMeNTi KI HeR KAHU-F ABt.
He has the face of a sheep over his arm of the right side (&) another over his arm of the left side.

This reading of the arm as an ideograph is retained by Dr. Brugsch, but it has been dropped by M. de Rougé; who, I think, first proposed it. It is certainly much easier to see difficulties in the way of this reading than to defend it or any other.

(19) T'eN-[A-]T (?), *the Elbow*. The same difficulty meets us here. The meaning of the group, or rather double group, is clear enough. The first sign is the syllabic hieroglyph T'eN, which we already met in col. (1). It signifies *flexure*. The *Lion* which follows is a

⁶⁶ Trans. R.I.A., vol. xxi., pl. II., p. 155.

⁶⁷ See Plate II. (68), from Todt. c. 26.

AUeRTA-NA Re-A eR T'aT RaTti-A eR ScheMe
There have been given me my mouth for speaking, my two feet for walking
AUeRTA-NA A-UI- eR SCheR ChaFT-UA
There have been given me two arms for overthrowing my enemies.

⁶⁸ Compare the figure Todtenbuch, Pl. LXXIX.



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dren behind their backs. In one of the most remarkable inscriptions known,⁷⁰ a sentence occurs in which PeST is found with two of its significations—

PeST-ek HeR PeST MuT-eK Plate II. (63)
Thou shinest upon the back of thy mother.

It is followed in the first case by the determinative of light, in the second by the ideograph of the spine.

(27) HeN, *the Phallus*. On this group I need only remark that the second sign is syllabic, and has the value HeN. It is preceded by its initial H, and followed by N, as its phonetic complement. Variants of this group sometimes admit NU as a final syllable, as in T'eN-NU, col. (1), and many others of the same form.

(29) ChePet (or, according to variant *k*, ChePeT-U), *the thighs*.

(31) MeN-RaT, *the two Legs*, and } There is no
 (33) RaT, *the two Feet*. } difficulty in recognizing in col [33] the Coptic ρ&τ, *foot*, which, like the older form of the word, seems to have been sometimes used in the sense of legs. In MeN-Rat, the first syllable, which signifies *firm, stable, straight*, is opposed to T'eN, *flexible*, in T'eN-Rat, the knee.

(35) A-T-U- [?], *the Hands*⁷¹ [?]. Here again we have a group of doubtful reading, and closely resembling that in col. (17). A good deal might be said about it, but as I am unable to arrive at a satisfactory conclusion, I think it better for the present to acknowledge the difficulty, and pass on to the next column.

⁷⁰ See Rev. Arch., viii. p. 56. The Egyptians, like the Hebrews and other ancient nations, were exceedingly fond of paronomasia. Many examples might be quoted. Perhaps one of the most curious is that about Horus and Typhon. Of the former it is said, Plate II. (64):

TeBTeB TeB eM TeB
He wounded Typhon in Teb. (Edfu).

See Brugsch Geograph. Inschr. (i. p. 165), who says that numerous legends at Edfu play upon this etymology of TeB, one of the ancient nomes of Egypt.

KTAU ReN HeSP TeN TeB eM TeB HoR TeB.
Lit. Is called the name of this nome *TeB*, from wounding Horus Typhon i.e. from Horus wounding Typhon. Ideographic writing would encourage this kind of wit, as when the Greek name Arsinoe was written with the signs ARi and SeN, the former being the ideograph of *guardian*, the latter of *brother*, and both together implying "guardian of her brother". The name of the Emperor Verus is written at Philæ with three signs, two of which (= UeR) were generally used for the notion "Princeps". On the Hebrew paronomasia and play on words, see Gesenius Ausführliches Lehrgebäude der heb. Sprache, §. 237, 238.

⁷¹ Or *sides*.

(37) AK-U, AB-U (??), *the Fingers and Nails*. The two groups in this column are distinguished from each other by the determinative, and the sign of the plural after the first. The first sign is the ideograph of *ifinger*, in Coptic $\tau\epsilon\beta$, and is generally read TeB. I am not prepared at this moment to discuss the point; but it seems to me that in the Ritual the sign is generally identified with the syllable AK, both as the determinative of that syllable and as its initial. The initial character of the second group is a polyphone character. It determines groups which have apparently but little in common. With the value AB it may be identified with $\epsilon\iota\epsilon\beta$, a *nail*. It has, however, frequently the value SaH, and may signify *bone*, a meaning which may also be derived from AB.

The *even* columns all begin with the Owl, which has the alphabetic value M. It corresponds to the Coptic μ , and, like that particle, interchanges with eN, as a sign of the "oblique cases", to use an incorrect, but consecrated, expression. It is impossible to point out any difference of use between these two particles when signifying "of, in, to", etc. Euphonic reasons, which have been assigned for the use of one rather than the other, under certain conditions, are really untenable. If we compare different copies of the Ritual, we shall find that in certain places eM is substituted for eN, and *vice versâ*. The accurate Peyron says⁷² that in Coptic " π plerumque ante β , μ , ϕ , *semper* vero ante π scribitur μ ". This, at all events, does not hold good for the hieroglyphic period of the language. It would be easy to quote abundance of proof to the contrary. A few well-known examples will suffice.

HRa eN BAK KI eM HRa eN PA
A face of a hawk, the other like the face of a human being.

King Mycerinus MeS eN PeT, *born from Heaven*. And the words BAK, PA, and Pet will suggest a number of other instances. The names of places beginning with B or P will furnish other examples. We have Thoth, the god, *en Pnubs* "of Pnubs" and "*en Pselk*" "of $\Psi\acute{\epsilon}\lambda\kappa\iota\varsigma$, Ammon *en Prem* "of Primis", Nephys *en Perner*, etc.

Besides indicating the cases, however, eM was employed in several ways in which eN could not be admitted as a grammatical equivalent. It would be altogether beyond

⁷² Gram. Copt., p. 49

my present purpose to illustrate these different uses,⁷³ and I must be content to refer the reader for further information to Champollion's Grammar, and a paper of Mr. Birch, in the *Revue Archéologique* of 1848.

Egyptian mythology.

We now come to the names of the divinities, and it will perhaps be expected that I should enter upon a dissertation respecting the Egyptian mythology, at least as far as regards the nineteen gods or goddesses mentioned in our text.

How far understood as yet.

I am sorry to be obliged to disappoint any expectations of this kind, but all persons acquainted with the subject will at once understand my reasons for declining such an undertaking as that in question. As far as the undertaking is a possible one at present, it has been successfully accomplished. The Catalogue of the Egyptian Museum of the Louvre⁷⁴ contains a short but most accurate summary of the religious ideas of the Egyptians, and must be taken as a necessary corrective to such works as Champollion's *Panthéon*, which, like every other book written before much progress had been made in hieroglyphic decipherment, is full of errors. Sir G. Wilkinson's book on the Ancient Egyptians contains a most important continuation of the work begun by Champollion, and Mr. Birch has enriched his "Gallery of Antiquities in the British Museum" with translations of very many hieroglyphic texts referring to the deities described by him. Besides these works,⁷⁵ it would be unjust not to mention two others, which, although not written by professed Egyptologists, will give a very fair notion of the present state of our knowledge with respect to Egyptian mythology. The first of these is Duncker's "Geschichte des Alterthums"; the second is Dr. Döllinger's "Heidenthum and Judenthum". The latter work, in particular, is of a wonderful accuracy.

⁷³ I have already quoted the phrase *Auz em schera*—"I was a child". In Plate II. (69), we have this passage from the Ritual:

HA-NA eM HeR HeMSe-NA eM PTaH NeChT-NA eM
I stood like Horus, I sat like Ptah, I conquered like
 Thut T'eSeR-NA eM TuM ScheMe-Na eM RaT-UA, T'aT-NA
Thoth, I lorded it like Tum, I walked with my feet, I spoke
 eM. RoA
with my mouth.

⁷⁴ Notice Sommaire des Monuments Egyptiens exposés dans les Galeries du Musée du Louvre, par le Vicomte Emmanuel de Rougé.

⁷⁵ I have not mentioned Brugsch's Geography, because it is not professedly or principally concerned with the mythology; but its immense importance in the study of the mythology cannot be too highly estimated. I am indebted to it for a great deal of what follows.



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Its local character.

Technical terms of relationship between gods and cities.

peculiarities of the Egyptian mythology is its local character. Every god was connected with some locality, and his name was commonly followed by a phrase indicating this relationship. A deity was said to be *Neb Abt*, "Lord of Abydos", *Hent en Senem*, "mistress of Senem", *fent* (78) *Sechem*, "dweller in Sechem", *her-het* (80), *T'am*, "presiding (deity) of Thebes", *am* (81), *Se-sennu*, "inhabiting Hermopolis", sometimes only the particle eM (or eN) was interposed between the name of the god and that of the town, as *Anup em Sechem*, "Anubis of Sechem", *Nit em Sau*, "Neith of Sais", sometimes one or more epithets were added, as *aa* (84) or *ur* the mighty, *mench* the beneficent, as the august: sometimes the name of an animal (a bull, a lion, a ram, etc.), with which the god was identified, e.g. *ur-t ur-u en Haatef*, "Neith the mightiest of the mighty of Haatif"; *Nebuut aat mench-t en Pe-chnum*, "N. the mighty one, the εὐεργέτης of Pechnum", *p-ka aa ur as her-het Matu*, "the most mighty (and) august Bull presiding over Matu".⁷⁹ Special titles were given to deities according to the place in which they were worshipped. Osiris was called *Che* "the child" in Thebes, *ur* "the great one" in Heliopolis, *ati* "the king" in Memphis. Every town had a cycle of divinities, Pa NuTeRU, Pl. II. (83) *συννάους θεούς*; besides other gods who were not included in the cycle. It frequently happened that in one town the same god was worshipped under different attributes or as coming from two or more localities. Thus in the remarkable inscription⁸⁰ on the exorcism of the princess of Bachtan, we find the god Chons, worshipped at Thebes under two titles, *Chons em T'ama nefr hotep*, i.e., "Chons in Thebes, perfect in his repose (?)", and *Chons p-ari sechen em T'ama*, i.e., "Chons executing counsels in Thebes". The god of perfect tranquillity is entreated by the king of Egypt to turn his face towards the god who executes counsels, and to give him his divine virtue. "And by the most extraordinary grace Chons in Thebes perfect in his repose gave his virtue four times to Chons in Thebes executing counsels". We read of Set the god of Senu, Set of Uau, Set of Un, and Set of Meru. Other forms of Set are found, but the four just mentioned are spoken of in one inscription as children of Tum. On the different forms of Osiris alone, unmistakably one god

⁷⁹ Brugsch's Geography, *passim*.

⁸⁰ Translated by Birch, Trans. R. S. of Lit., vol. IV., and de Rougé, Etude sur une stèle Egyptienne.

and yet many, a volume might be written. But until we have read a vast number of texts which still remain to be deciphered, any work professing to give a philosophic view of Egyptian mythology must be condemned as premature. It will, then, I hope, be understood why the following remarks on the names of the Egyptian divinities mentioned in our text are confined to the illustration of that text, and chiefly with reference to its decipherment.

[Col. 2] Nun? This group is composed of the following signs:—1st, Three vases; 2nd, An ideograph of *the sky*, often painted blue, and studded with stars; 3rd, Three straight lines; 4th, The figure of a god. Of these the god is the determinative of divinities generally. The straight lines are put in cursive writing for the waved lines representing water, and constitute the ideograph of that element. It is not difficult to understand that “celestial waters” are implied in the combination of the two ideographs. The three vases, which are also ideographic, are generally read Nun, and supposed to correspond to the Coptic N O \Upsilon N *abyss*, the whole group signifying the “celestial abyss of waters”. This, however, is one of those readings which requires to be subjected to fresh criticism.

Names
of deities
in our
text.

Lest this uncertainty as to the reading of the first god in our text should seem discouraging, it may be as well to say that it is the only one about which a doubt can exist. And to persons more advanced in the study than I, the reading may, perhaps, be free from all doubt.

(4) RA. The name of this god is written first with the sign of the Sun (Coptic pH), which is the ideograph of Ra, and then by the alphabetic signs R and A, its phonetic complements. Representations of this deity, and of several others of our text, will be found in Birch’s “Gallery of Antiquities”.

(6) HaT-HoR. The name of this goddess is here expressed by the hawk, ideographic of Horus in the sign of *a house*. This latter sign has for phonetic equivalents the signs H + T, giving us the word HaT, of which T is, perhaps, not radical but the feminine termination. We have already had occasion to speak of the variants (60) and (61) of the name of Hathor. Plutarch was aware that this name signified the “abode of Horus”.

(8) AP-HeR-U. . The first sign of the name Ap-heru represents two horns, and as it is frequently accompanied

by the alphabetic 'signs A and P (sometimes P only),⁸¹ it was very naturally supposed for some time to have the syllabic value *Tap* corresponding to the Coptic $\tau \& \pi$, a *horn*. As the A, however, is always written *before* the sign, it is still more natural to suppose that letter to be the initial one. The next sign represents a road, and is pronounced HeR or HoR. This value is undoubted, as appears in variants of the names of Horus, Anhur, etc. The triple repetition of the sign gives us the value HeR-U. This whole name signifies "guide of the ways". Ap-heru⁸² is a form of Anubis, and we find an *Ap-heru Res*, "guide of the paths of the south", and an *Ap-heru Mehi*, "guide of the paths of the north".

(10) FeNT SeCheM, "the dweller in Sechem". We have already met the first sign in col. (9), where it appears as the ideograph of FeNT(I), the nose. It is replaced in variant *g*, and in countless other places, by a sign which may be proved to have exactly the same value. The T which follows it here is a phonetic complement. The word SeCheM which follows is easily read, as it is made up of three purely alphabetic hieroglyphs, but it is followed by three ideographic signs. The last of these which precedes the sitting figure of a god is the determinative of *cities*. It is found again in col. (20) after the name of Sais, and in col. (22) after that of Ker. The sign before it is the ideograph of dwellings, and is frequently put after the names of towns, villages, and other dwelling places. The sign preceding the two last is an ideographic sign of negation or repulsion commonly attached as a determinative to the word CheM. This last word is found at the end of the fourth line of the Rosetta inscription (with the two determinatives just spoken of) in the place where the Greek has *ναους*. The sense of sanctuary "adytum" suits a multitude of passages in hieroglyphic texts where the word occurs, and the ideographic sign of repulsion most probably expresses the same notion as that of the Greek *ἄδυτον*, *ἄβατον*. Whether there be any etymological connection between *Chem* in this sense and the city of Sechem (Letopolis), I am unable to say. It frequently happens that syllables which require certain deter-

⁸¹ In the title of an ancient personage (Lepsius, Denkmäler, Ab. II., Bl. 85) the horns are followed in one instance by T and P. A variant of the title in the same tomb places, however, the T after the P.

⁸² This name is not to be confounded with that of *Ap-er-hu* which is given to Thoth as god of Hisoris. Brugsch, Geog. In sch. I. p. 216.



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“phonetically” [that is, of course, *syllabically*]⁸³ “into the composition of names”.

The name Tatu, here followed by the determinative of towns, is written in different ways [see variants (86) and (87)], from a comparison of which⁸⁴ it is not difficult to ascertain the value of the initial characters, which appears to have been TaT. . It represents what used to be called a Nilometer, but was, in fact, a mystical emblem, significant of stability, not necessarily peculiar to kings or gods, but often buried with the dead as a talisman, according to the prescriptions of the Ritual.⁸⁵ One of the important ceremonies of the Egyptians consisted in “raising the Tat”. The U, which is often written at the end of the name Tatu, is, in one of the variants, placed in the middle of the word, and was, no doubt, pronounced there. TuT, in this case, would be a more correct transcription than that commonly adopted. We need not now inquire where this city was situated, or discuss the rival claims of This or Mendes. There is no doubt, however, that it was an extremely important town,⁸⁶ and its name occurs particularly in all texts relating to the dead, or to Osiris, who was worshipped here under the form of the “Ram Lord of Tut”. In this form, however, he was one of “the children of Tum”, and “the eldest of his brethren”, a totally different family from that of Seb and Nut.

(20) NiT NeB SaÜ, *Neith Lady of Sais*. The name of Neith, which is generally expressed by the Shuttle, is sometimes alphabetically determined, as in the variant (90), where the letter N and T accompany the Shuttle. Sais is written with four signs, including the determinative of cities, first the alphabetic S, as a double of the

⁸³ The example he gives (Dict. p. 403 sqq.) explains his meaning clearly enough, *Nebreds*, *Nebounnounf*, *Ponebsar*, *Nebenchari*, *Nebti*. If this be not admitting a syllabic value for a hieroglyphic sign, I do not know what is. Yet the value *Neb* for the very sign in question is one of those syllabic values which Champollion's disciples are said to have stolen from Dr. Seyffarth. See the Gram. Ægypt. p. xlv. of the writer just mentioned.

⁸⁴ The last variant in (86) is given on the authority of Lepsius and (87) on that of Brugsch. The others are frequent enough.

⁸⁵ See Plate II. (88). TaT eN NuB MeNch HeR CheT
a Tat of gold, made out of the trunk
 eN NeH-U eRTA eR CheCh eN Chu
of Sycamore, placed at the throat of the dead.

Ib. (89). HeB SeHa TaT = Feast of raising the Tat. Cf. Todtenbuch c. 18.

⁸⁶ Plate II. (77). NoK HoR PiR eM TTU ST'eR eM ABT
I am Horus born in Tattu buried in Abydos.

Goose (=S) which follows, and after these two the alphabetic U.

(22) NeB KeR, *the Lord of Ker*. The determinative of cities follows the sign of two arms holding a mace and shield. The latter sign appears as the ideograph of the word KeR, to fight, and also of the city so called. The famous city of Ker was situated in the Delta, though it is impossible at present to say in what part. Nor is it possible to say who was the "Lord of Ker" in our text. We only know that Osiris, Ap-heru and other gods had a local worship in the town, and that the Nile is called "father of the gods of Ker".

(24) SeT Ki-T'aT TeT. *Set, otherwise called Thoth*. Here we have first the alphabetic letters S and T, then the ideograph of the word SeT, a rock. "The block of stone", says Mr. Birch, "is introduced because the name of the god was pronounced in the same manner as *Set*, the rock". The two next signs come together extremely often in the *Todtenbuch*. If we look at the corresponding passages in other copies of the Ritual, for instance that published in the 2nd vol. of the *Description de l'Egypte*, we shall find our two signs replaced by the variant (91) which gives us the well known words KI Ta'T, *aliter dictus*. The Ibis on a standard is the well known ideograph of the god Thoth, whom the Greeks identified with Hermes.

(26) PaChT. The reading of this divine name is beyond all doubt, as the first sign of it is in many cases replaced by the alphabetic P, and the other two signs are alphabetic. It would, however, be false reasoning to argue that the first sign is equivalent to the first letter of Pacht's name. It is an ideographic character, and cannot, as far as I am aware, be proved to have the value of P in any other name than that of the lion-headed goddess.

(28) HeSARi, *Osiris*.

(30) ARi(T)-HoR. *Ari-hor*, lit. *the Eye of Horus*. The stroke which occurs twice in this name,⁸⁷ once under the Eye and again behind the Hawk (= Horus), is not phonetic or even ideographic. It is employed chiefly for the purpose of filling up a vacant space, squaring or harmonizing the appearance of hieroglyphic groups, and avoiding confusion between successive groups. In this way it sometimes accidentally acquires a quasi-ideographic

⁸⁷ Compare the variant (93). (92) is the ordinary mode of representing the goddess. See Sharpe, *Eg. Inser.* Pl. 51.

use. Thus in the passage (55) already quoted, we are enabled to distinguish the right reading Ro eN NeCheN from another possible one ReN eN CheN. Dr. Brugsch has thrown most light on the subject of the goddess here called the "Eye of Horus". On the Metternich stele we read (94)

HoR, AMeNT ARi(T)-K eM SU ABT ARi(T)-K eM TaFNuT
 Horus, thy left eye is Su, thy right eye is Tafnut,
 MeSU PU eNT RA.
 the children are they of Ra.

As the latter of these divinities alone is female we may conclude (if conclusions may be allowed upon such a subject) that Tafnut is the goddess intended in col. (30) of our text.

(32) NuT. This goddess is the wife of Seb, and mother of Isis and Osiris. The letters NT are followed by the ideograph of the sky. As this sign is omitted in variants,⁸⁸ there is no reason for supposing it to be used here phonetically. The three other signs have already been explained.

(34) PTaH. This name consists only of alphabetic signs followed by the determinative.

(36) HaRScheF. None of the signs here require any notice except that of the Sheep's head (or face) determining the group Harschef, which literally signifies "sheep's face". The good Harschef, whom there is every reason for identifying with the Ἄρσαφῆς of Plutarch, is represented on monuments with the Ram's head, exactly as the ancients describe Jupiter Ammon.

(38) ARA-U ANCh-U, *the living uræus (divinities)*.

In the year 1827 Champollion gave a translation of our text, or at least of one very like it, and he concluded from it that each limb of the deceased was dedicated to some Egyptian divinity. This conclusion did not necessarily follow from his translation "Ses yeux *appartiennent* à la déesse Hathor"; "ses pieds *appartiennent* à Phta", or the more literal and accurate "Les oreilles . . . *sont* à Macédo-Dieu". Too literal a sense cannot be given to these passages which describe *metamorphoses* undergone by the deceased. "His face is the face of Ra", "his eyes are the eyes of Hathor", "his feet are the feet of Ptah". A considerable part of the Ritual is taken up with an ac-

⁸⁸ See among others Brugsch, Taf, xlix, 1324.



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years before most emphatically declared that no living man was capable of translating a single section. Mr. Birch would not have allowed such a promise to be made if he were not perfectly able to fulfil it. There is no doubt that when his translation appears, many passages of it may call forth the objections of competent critics, but the discussion will certainly not turn upon its general accuracy, and even scholars much inferior to Mr. Birch may be enabled through his labours to correct oversights or inaccuracies of detail.



ART. IV.—*An Essay upon the Date of the Book of Job.*
By VERY REV. JOHN CANON MORRIS.

Apparent
hopeless-
ness of
the sub-
ject.

THERE are some controversies which have lasted so long, that it looks like a mixture of foolishness and of presumption to say anything with a view to settling them. The question, at what time Job lived, is a question which to many readers will doubtless appear to involve a controversy of this nature. This is not the question upon which it is proposed directly to enter here: the question we are about to discuss is, at what time the Book of Job was written, and not at what time the man Job lived. If, in discussing the former question, we do anything towards settling the latter, it must be remembered that it will only be done incidentally. Of course, the greater approximations we make to knowing the date of an author, the better position shall we be in for understanding the drift of his book, the circumstances to which he makes his characters allude, the anachronisms he would be guilty of if he put into their mouths things later than the age he intended them to belong to, and the unfitness of quotations taken from authors who lived long after the date he meant to represent. Still the questions are two questions: the age of the author is one thing, and the age of his hero (so to call him) is another. But even our attempt to decide the age of the *author* of the Book of Job will seem to many readers to involve an interminable question. Surely, it will be thought, the data upon which such a decision can be founded have been so long before the world, that, if any really reliable decision could be formed, it must long ago have been discovered.

A man who pretends to come to a conclusion upon such a subject, must, it will be urged, be either foolish or presumptuous.

I. *Bearing of critical science upon the question.*

2. Nevertheless, as there *are* people who have discussed the Book of Job without possessing even the commonest knowledge of Hebrew, it does not seem absurd to express a conviction, that as in other cases, so in this, folly and presumption admit of degrees: the conclusions here come to are at least results from the study of the original Hebrew. The question, when the author lived, must be of *some* weight in deciding the drift and intention of the Book. And this question is a purely critical question, as much as the question when Galen, or Athenæus, or Lucian lived. It must be decided, if it can be decided at all, by a study of the original texts, the phraseology employed, the events alluded to, or the authors quoted in either of these cases. A critical question, in fact, is a question to be decided by the observation of certain phenomena; and although a man who has *some* of the cognitions requisite for observing those phenomena may easily overrate his powers, it seems quite certain that the man who has *none* of them must be as a blind man arguing about colour. A critical question is to a great degree parallel with any scientific question: as utter ignorance of chemistry disqualifies a man from discussing a mineralogical question, so does utter ignorance of Hebrew disqualify a man from discussing the date (or consequently the drift) of the book before us. But directly we begin to regard the question as a critical or a scientific question, it will appear possible for a person possessed of limited attainments in Hebrew to observe and to group phenomena which have not struck others. It is no more presumptuous, in such a case, to think one sees a critical matter in a new light, than it is to think that one sees a scientific matter in a new light. Men of greater critical, or greater scientific powers, may prove that light to be an *ignis fatuus*; but they will hardly accuse one of sheer folly and presumption, if they find one not wholly ignorant of the data upon which alone a conclusion can be arrived at.

Critical nature of it insisted upon.

3. But it is with criticism as with other sciences: extraneous prepossessions and a desire of ulterior results warp the mind, and the scientific man is often condemned

Extraneous preposses-

sions
against
this use
of it.

by unscientific judges. A jury of critics too is not the only tribunal before which an aimer at criticism must expect to have his merits tried. Yet in a case like the present it is surely clear, that, until we have decided, as well as we can, the purely critical question, "when did the author of this book live", we are not at all in a fair position for drawing any ulterior conclusions from the contents of the book. To take a parallel case,—a writer on liturgical antiquities might draw certain ulterior conclusions from the works known as the Clementines or the Areopagitica; it is his business to do so. But it is not his business, nor the business of any science but that of criticism, to determine at what period those books were probably composed. Criticism must hand over to other sciences conclusions which they may or may not see fit to use; but criticism must come at those conclusions by its own principles, much as chemistry, or geology, or astronomy come to conclusions about matter, or the Deluge, or the *cælum empyræum*. Whether the adept in any other science likes these conclusions or not, is nothing to the critic; he has no infallible principles to go by; he gives the results of a human science in a certain stage of advancement, which results posterity may possibly overthrow. But he, as a critic, has a right to see that criticism has fair play, has a right to see that his conclusions are not set aside simply and solely on the strength of prepossessions extraneous to his own science. To put the matter in an English way, he may claim at least to be tried by his peers.

Apparent
origin of
them to
be found

4. Prepossessions of this sort are sometimes local. In this part of the world, the dominant opinion about the Book of Job perhaps is, in spite of a few learned disclaimers, that both the person of Job and the author of the book are of remote and patriarchal antiquity. The probable source of this opinion is to be found in an addition made to the end of the book by the Greek version, commonly called the Septuagint. From this source the opinion flooded¹ all such commentators as had no knowledge at all, or a very slender one, of the original Hebrew. To identify Job and Jobab as the Septuagint does, is to practise upon the ignorance of a person who knows nothing of Hebrew letters or etymologies. Yet this is the remotest date to which that opinion can be referred. But as that version bears throughout the book the most un-

¹ See Pererius in Genes., p. 859.



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items weak in themselves, may yet, when taken together, be incapable of being broken. The state of opinion then among us, in regard to the book before us, forms a local prepossession against a person who attempts to handle the matter critically, strong enough, it is conceived, to justify this prelude to what we have to offer.

General
likeli-
hood of a
Jewish
origin.

6. In treating this question, men have sometimes indulged by far too much in considering what might have been, to the neglect of what is likely to have been. "Job might have talked pure Hebrew in the days of Melchizedek", would be a statement of which this remark would hold good. But this is not *likely*: and here we mean to rule our course by what seems likely. Now there is not (it is believed) one atom of trustworthy evidence that any nation but the Jewish nation ever spoke or wrote in the Jews' language, as it is called in Isaias, xxxvi. Himjaritic, Palmyrene, Abyssinian, Babylonish, Punic, and even Etruscan,² inscriptions have attracted the notice of Semitic scholars. Of all the Semitic dialects, none probably came so near to the Hebrew as the Punic (see Mover's *Punisch. T. im Plautus*, p. 5; *Opferwesen der Karthager*, p. 16; and Renan. *Hist. des L. Semit.*, p. 178; Augustin c. lit. *Petil.*, ii. §. 239, *Punicæ linguæ consona alia Hebræa permulta, et pene omnia*). Yet, if both Punic and Hebrew *were* the offspring of an earlier Canaanitish language, the Punic we have contains abundant marks of having become so distinct from Hebrew, that it is probable that an unlearned Jew would not have understood it. And this will seem truer, if we reflect that, on viewing cognate languages from a distance, either of time or of linguistic character, we are apt to overrate similarities and to underrate dissimilarities, so that Hebrew and Syriac, for example, appear to us far more alike than they would to an Arab or an Ethiopian. But even supposing that some unknown tribe might have written and spoken as beautiful Hebrew as that in which the book of Job is composed, still the likely thing is, that a book written in good Hebrew is the work of a Jew. If we could draw up from the bottom of the Mediterranean a Greek MS.,

Illustra-
tions
of it:

² Steinschneider, *Hebr. Bibliog.* p. 120, laughs at Stickel's essay, *Das Etruskische, etc.*: here it is alluded to as usefully bringing together various specimens of the rare Semitic forms, even if it be ein höchst unglückliches Versuch. See also *Zeit. der deutsche morgenl. Gesells.*, xiii. p. 289.

who would say, it 'might have' been written by Cicero, Hanno, or Cleopatra? The presumption surely would be, that it was the work of a Greek. No man who read *Cecile* or *The Pervert*, or *Madame de Bonneville*, would be justified in assuming that the first might have been written by a French gentleman, and the latter by an English lady. *A posteriori* evidence can compel us to come to such a conclusion; internal evidence in some cases might induce us to adopt it; but when we have not *a posteriori* evidence to compel us, and not sufficient internal evidence to induce us, to adopt such a conclusion, the "likely" thing is, that an English book is the work of one who speaks the English language, and a French book the work of one who speaks the French language. In a similar way, as we only know of one nation who spoke the Jews' language, the likely thing is, that a book written in that language is the work of a Jew. When other considerations have fairly driven us from that hypothesis, then, and then only, may we fairly give up this presumption and speculate as to what "might be".

7. From the category of such other considerations ought rigidly to be excluded mere negative proofs, and by mere negative proofs are meant such as are not used simply as confirmations of positive objections to making Job a pious Jew. If beliefs, customs, phraseological peculiarities, and the like details, which go to show that Job was not a Jew, can be mustered in sufficient force to *overpower* the numerous details which go the other way, then negative proofs will be of weight as confirmatory evidence. But you cannot argue, for instance, that if Job were a Jew, he would have spoken about the Sabbath. For nobody supposes that the Psalms are not the work of Jews; and yet, as St. Augustine (in *Ps.*, xxxvii. 2) has shrewdly noticed, the Psalms nowhere mention the Sabbath; though, in a body of devotional compositions by very different authors, one surely might have expected such a markedly Jewish institution to have been noticed. Of circumcision the same might perhaps be urged. Merely negative proofs, then, will go for very little, or for nothing at all. It will be our business by and by to show the untenableness of some views supposed to afford positive proof that Job was no Jew; but here we are simply anxious to prevent the adverse influence of merely negative grounds upon the position already taken up,

is not to be set aside by negative evidence.

which is this, that the presumption is, that a book written in pure Hebrew is the work of a Jew.

External evidence of small use in this case.

8. It should also be distinctly urged here, that nothing whatever like *external* evidence exists to show that either author or hero belonged to a patriarchal age. Vague, nonsensical, and sometimes palpably absurd traditions, furnished by Arabs and others, are really not for a moment deserving of consideration as external evidence; still less can they be set off against clear internal proofs of a later date. It is to the book itself, and to the numerous lights thrown upon it by the rest of Jewish literature, to which we must look for anything like reliable conclusions. The actual inspection of the actually used Hebrew words can alone either originate ideas as to its probable date, or put one in a fair position for carrying them out when once they have suggested themselves. No amount of unauthorized traditions, or of negative proofs, will justify the neglect to look into these minutiae, which would unquestionably tally with the statements the former suggest, if the former held within them any approximation to the truth. But these minutiae, as we hope will be made perfectly clear, lead us to adopt a date for the book in perfect accord with the only clear external evidence which we possess about its "hero".

The book not a translation.

9. People have been found so bent upon considering what "might have" been the case, that they have thought the book "might have" been translated by Solomon out of Syriac. It wants more of the patience of Job than of the wisdom of Solomon, to deal with dreamers of this sort. However, we shall in the sequel take occasion to say a few words upon the hypothesis of a translator, as the composer of the present text. Here that hypothesis is simply noticed as a dream, which indeed would, if it were true, destroy the general presumption to which we have adverted, to wit, that a book written in good Hebrew is presumptively the work of a Jew. But it may be added, that the whole course of argument hereinafter adopted will probably, without any effort distinctly directed to that end, entirely remove from the reader's mind any lurking suspicion that the book is a translation. When we have got through that course of argument, then we shall be able, without an effort, briefly to enforce the impracticableness of such a theory.



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fecerit auspicium. It must, however, be obvious without instances that if these tenses are tenses, this is a very queer proceeding, and that, if they are not tenses, it would be rather desirable to ascertain what relationship they bear to each other, before we commence translating a book as difficult as the one before us. “Shall” and “have been”, in our language, convey such different ideas, that an English reader would see, with very little thought, that he must be completely at the mercy of a translator who uses two perfectly distinct Hebrew forms, sometimes for the one and sometimes for the other. But we will spare him even the little thought necessary to convince himself of this assertion by putting before him a simple sentence in the Book of Job, ii. 10—גם את הטוב נקבל מאת האלהים ואת הרע לא נקבל. As we have here the same form נקבל in the same sentence twice over, a grammarian can hardly help feeling a curious impulse to translate them in the same English words in both instances. When he finds other inaccuracies in a translator, who translates them with different words, his suspicions that such a translator knew nothing about the real nature of the Hebrew tenses waxes stronger, of course. When, therefore, the Greek translators confound גם with גם and מאת with מיד, it is very hard to believe that they had any distinct ideas as grammarians what they were about. But, at all events, obstinate common sense must refuse to believe that Job’s major premiss remains the same, whether we make him say, “If we *have* received good from God”, or “even the good we *shall* receive from God”; and then, of course, common sense will expect the second נקבל to be translated in the same way as the first, if it can be. It is one thing to meet his wife’s proposal, by looking to the recompense of reward hereafter, and another thing to meet it by urging that he had had so many good turns from Heaven in times past, that he ought to put up with an ill turn now. In the former case, the גם is a sensible adjunct to the sentence; in the latter, it was wise to change it into גם. St. Paul thinks pagans ought to have been thankful for what they had had, but that perfect Jews should look to future recompense; but this, by the way, from a writer evidently acquainted with what Jews would think and feel. “Shall we not receive evil”, is a clause in the same plight. If the former may be translated, “We have received”, then this may be translated, “We have not received the evil”—*i.e.*, from God, but from Satan. So, too, if

Practical illustration of the importance of the “tenses”.

הוֹדִיָּה be rendered "locuta est", it makes a severe assertion: if it be rendered, "Wilt thou speak as one of the foolish women do?" it exempts the man who is not to sin with his lips from saying, "Thou fool" to his wife. It is, therefore, perfectly clear, from these most simple instances, that Job's character is pretty much at the mercy of a translator, who thinks that the so-called futures and perfects may be, or not be, translated as such, just as he wills. It is also perfectly clear that, as nobody would even attempt to deal with Greek and Latin tenses in this way, Hebrew tenses must be tenses in some vastly different sense from that in which the Greek and Latin forms are tenses. This much at least is incontrovertibly certain, that these are in no sense adequate representatives of the Hebrew forms. And the reader may be certified that this is not an arbitrary and accidental instance, selected for the purpose of a theory, but that, throughout the whole book, an exceedingly different aspect is given to a vast variety of passages, accordingly as we believe, or do not believe, that these Hebrew forms have an ascertainable relative value.

12. Now the best thing that could happen to us with a view to ascertaining this relative value, would be to be in a position to assert that there *are no* tenses in Hebrew, only moods. From what has been said already, it is quite plain, and from what will be said it is hoped it will be more plain, that they are not tenses in the European acceptation of the word. To call them tenses is a piece of courtesy to European prejudices, and nothing more. For whatever becomes of Meier's ingenious theory (pref. to Heb. Wurzel Lexicon) that Hebrew perfects were originally generated by reduplication, certain it is that those perfects are operated upon to make "futures" out of them, as if their original structure was completely forgotten. Thus if כַּעַשׂ be from כַּעַשׂ, whence כַּעַשׂ, much as jagaja comes from ji, or πέφυκα from φύ, still יכַּעַשׂ is formed from כַּעַשׂ as if it, and not כַּעַשׂ, were the root. But in European verbs, as in European sentences, there is a feature, absent apparently from those of the Semitic tribe. It is this; European, or Sanscrit, or Indogermanic (for we need not here dispute about the name) verbs and sentences have at all times and in all places evinced a tendency to introduce that which Aristotle in his logic takes little or no notice of—the copula. Thus καλός ἐστιν ὁ ἀνὴρ is the Greek as well as the English way (*mutatis mutandis*) of say-

Hebrew
"tenses"
in no
sense like
Euro-
pean.

Attempt
to ascer-
tain their
real na-
ture.

ing “the man is good”. But a Hebrew would say טוב האיש without any copula. So in English we say, I am to hear; in Latin, au-di-b-o, or, to take the more modern form, audi-a-m. Here the *b* is a fragment of the copula, = βv , and the *a* of *as* = *is*; *o* and *m* represents the pronoun. So $\tau\upsilon\psi\omega$ is from $\tau\upsilon\pi\text{-}\epsilon\sigma\text{-}\omega$ “to beat am I”. These and other cases more or less clear, attest the existence of an Indogermanic principle: to wit, that it is a right common thing in those languages to introduce an auxiliary verb into that which they use to express a tense. Whether this be done by a sentence or by a verb, which in many languages is as much a prosentence as a pronoun is a pronoun, does not signify. It is a peculiarity in which Semitic languages do not rejoice. שמע is, “I to hear”, not “I am to hear. שמעתי is “hearing I”, and not “hearing have I been”. There is, indeed, no proper verb in Hebrew either for to ‘be’ or to ‘have’, which is one reason why they do not use them in tense-making. Or, if this last assertion be disputed, at any rate they do not so use them. The use of ܐܘܪܝܢ in Syriac after perfects is an attempt at an exception; perhaps, too, the ܐܘܪܝܢ of Hebrew is a remnant of א״י = *u*, and was once an approach to the same thing. But as a rule, the tenses, as they call them, are not made of anything but a raw root and a fragment of a pronoun, which can hardly express them as accurately as a root, an auxiliary, and a pronoun. The Syriac form ܐܘܪܝܢ well illustrates the Semitic notion of tense-making: it stands for “I am killing”, “was killing”, or “shall be killing”. It is a rude prosentence, whose tense must be divined from the context, but it is not a tense in the sense in which we talk of tenses in Europe. To put two words closely together, and not thereby to suggest some connexion in the speaker’s mind to the hearer’s mind, is impossible. Nobody would like to hear a vituperative epithet joined to his own name, even without a copula; or suppose that when it was so joined, there was an ellipse of “is not”, “will not”, or “never was”. But to state the time in a tense, something more is wanting than mere connection of subject and predicate. Auxiliaries which imply “to become”, naturally express a future: those which express possession, as naturally express also the certainty of the past. But to compound a tense out of any *three* such elements appears to be a step beyond the energies of the Semitic languages. Any variations which exist of certain Semitic futures, appear to result much more from the more or less intense

Auxiliary verbs often constituents of European tenses;

but not so in Semitic.



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and last in all non-dependent ones. This it does do. Thus if, setting aside the accident of the accompanying vowel, we regard *t* as representing [twa, ta, tu, or ti] the second person, it is evident that shama 'ta must be a mood which makes a definite assertion, and ti-shma' a mood which makes a dependent assertion. As Agatho says that the past is a thing which God cannot alter, a strong definite assertion very naturally forms a tolerable substitute for a European preterite. The other form, with slight euphonic variations, of course will do duty for all that is contingent, future, optative, or conjunctive. But either of these forms is far enough from being an exact representative of an European tense: moods they are, and moods they will remain, albeit men who drew their notions from Greek grammarians compelled them to bear the yoke of Indo-Germanic verbs in a dreadfully arbitrary manner. But this is no reason whatever why we should ignore their clearly-marked distinction, and put for the contingent "we are to receive", the non-contingent "we have received", jumble together positive with dependent assertions, break down all subordination in sentences, put past for future and future for past, good for evil sometimes, and turn blasphemies of Job's "friends" into the wise saws of holy dervishes.

15. Mádmen, it is said, sometimes reason correctly upon false premisses: at all events, they reason boldly: and so did the Hebrew grammarians, who were of old men of renown. After they had determined on the false premiss, "Hebrew moods are European tenses", it was found necessary to invest a common "and" with the super-divine power (for Agatho would have thought it so, and Dionysius have called it so) of turning futures into perfects, and perfects into futures! Men who would have shrunk with horror from a conversive "and", fell down and worshipped a conversive "vau". When the tenses were tenses, then no doubt the facts were facts, and "and" was conversive. It is clear that, however hard it might be to ascertain the real state of the case, it never could be this. To say that a certain form, arbitrarily employed to express a past, by the addition of an "and" to it, expresses a future, is to confuse everything in a language. It is so complete a *reductio ad absurdum* of the whole system, that it literally is like in boldness to a madman's reasoning upon a false premiss. But a mass of difficulties will vanish from the field directly we fairly see and acknowledge that the Hebrew forms

Hebrew
tenses
are really
moods.

The con-
versive
vau, and
its incre-
dible
powers.

called past and future are (so to say) an orist and an a-orist mood. Dependence, either actually stated or implied, is always expressed by the latter, and non-dependence by the former. Clauses may imply dependence even when they do not state it. Thus the clauses "If I don't beat you", or "If they shall enter into my rest", are clauses which imply dependence, even though that on which they depend be not distinctly before the speaker's mind: they are a species of brachylogy, in using which he is fully aware that they depend on something not expressed. Here, however, we make no pretence of going into all the intricacies of the question. Enough has been said to make it extremely credible, that men who believed in the conversive *vau* and all the absurdities thereto belonging, must give to many a passage of the book of Job a meaning, which those who entirely disbelieve therein cannot at all accept. He who makes subordinate clauses into co-ordinate ones, and translates a series of perfectly different Hebrew forms by one and the same European form, obviously must elicit from our author a very different meaning from that which a person who goes by the principles just stated will elicit. Neither will the Jewish features of our author strike him as strongly as they will the latter.

Practical bearing of disbelief in them.

16. A simple instance or two will again be the best mode of suggesting to the reader that something really does depend upon the view we take of the Hebrew tenses. In chap. iv. 10, then, Eliphaz says, according to the aforesaid views about the moods:

A lion's roar, a jackal's voice,
Or young one's fangs, outshak'n have been,
What time the old one dies from lack of prey,
And thus she-lions' bearns get scatter'd far.

Illustration of the foregoing from the Book of Job.

Here the perfect (to keep to its old pseudonym) expresses a non-dependent fact,—the participle somewhat contemporaneous with it; and the so-called future somewhat resulting from these two. The meaning will then be, if we judge by the moods, something of this kind:—"As the attendant animals roar in vain when the old lion is dying, and the she-lion's young have in consequence got scattered, so do Job's friends in vain thunder admonitions, now that Job has lost all, and his own wife's children are scattered from him". Thus a vague general sentiment becomes a just and appropriate sentiment. And Eliphaz then proceeds to speak of the dis-

embodied spirit which appeared to him. After human arguments have failed, it is very natural to have recourse to superhuman, and to say, "if you will not listen to us, you may to a spectre". The context therefore favours the sense here put on the former part of the passage. Let us, however, add another simple passage, where many translators bestow upon the vau a conversive force, although the so-called future keeps aloof from it (ibid. v. 3): הנה יסרת: "How oft hast thou set others right, and flagging hands thus wouldest brace!" would be our rendering of it: *i.e.*, we must consider תהזק to be represented as in dependence upon יסרת, and not as coördinate with it. What the English "thus" literally says, that the Hebrew change of mood delicately suggests. Translate it "and hast braced", and the connection between the former and latter clause intended by the author is made to evaporate. All kinds of delicately-suggested dependencies all through the book, are destroyed by the reckless neglect of this beautifully-harmonious system of moods. Perhaps it is hardly wrong to say that many a platitude is thus often made to occupy the place of the finest observations and the most instructive sentiments; so at least it appears to ourselves. If it be said that "a man has set others right and cheered them up", plainly it is different sentiment from that which puts the one in subordination to the other. "The way in which you yourself would cheer up other people was by enforcing upon them principles", is a biting and telling position. The former statement is not so. If with reflection it is possible through the whole book to translate upon this principle (and it is possible), surely it is rude wrong and injustice to the Hebrew language to translate perfectly distinct forms, as if no such discriminating principle existed.

Reflec-
tion
thereon.

Parallel
absur-
dity from
Greek
Gram-
mar.

17. It may be well to add here a rough parallel from Greek grammar, to the treatment which the Hebrew moods have met from the believers in conversive "and", for that is the honest name to give it. As, then, the old Greek grammarians imagined a genitive—dative—and—accusative—governing virtue to reside in certain prepositions, instead of looking to the change of sense in which the noun itself was employed for the cause of the change in its form; so the Hebrew grammarians gave to the particle vau a power of effecting changes in the meaning of forms, which changes really resulted from the sense in which those forms were used. As the shades of meaning



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then into ἡ βιῆ. But the eldest form belongs to a period when ibi was the dative of is, and ibus the dative plural, or when twabi = tibi and twabis = vobis were coming out of chaos. "Its", again, in Shakspeare, had, perhaps, no existence: "his" takes its place. Chaucer and Mother Juliana use a second plural, "makyth", for "ye make". In the far less changeable (see Welte's admirable little treatise, *Das Nachmosaisches im Pentateuch*, p. 6) Semitic languages, the absence or presence of such archaic forms is much more telling than it is in the Indo-Germanic languages; their presence does more to prove, their absence more to disprove, the antiquity of a book, than either would do in an Indo-Germanic author. The absence of such a use as "his" for "its" certainly would make it likely that the author, in which such use was absent, was later than the time of Shakspeare; and so with the other cases.

The
masc.
and fem.
pronouns
not con-
founded
as in the
Penta-
teuch.

20. Now in the Pentateuch the pronouns הוּא and הִיא are (as is the case with other roots in which ו and י are interchangeable) used indiscriminately. Proper names, those usually faithful depositaries of archaic forms, keep up traces of the same indiscriminate use. Penu-el and Peni-el, Betu-el, Melchizedek, the formula הִיא אֵיךְ and הוּא אֵיךְ, and the ו prefixed to the third person "future", are all cases in which such traces remain. A *parallel* archaism exists in the form קטלתוּני, formed from קטלתוּם instead of קטלתוּ. But in the Book of Job the Mosaic confusion of the masculine and feminine form of the pronoun has vanished, except in one instance, and that an instance which itself tends in another way to show our author to be later, at all events, than Moses. In chapter xxxi. 11, then we have the words, כִּי הוּא זָמָה, וְהִיא עֵוֹן פְּלִילִים. Now, as this is said of adultery, and the phrase הוּא זָמָה occurs twice in Levit., xviii. 17, and xx. 14, of incest, it is not unlikely that the above was a quotation from Leviticus; and that it suggested, by way of contrast, the phrase וְהִיא עֵוֹן, unless that also belonged to some older adage; for in chapter xxxi. 28, we have the phrase גַּם הוּא עֵוֹן פְּלִילִי. But as there is another difficulty common to both passages, viz., that עֵוֹן is not the construct; as moreover it is hard to say, even if it were the construct, why "a judge's iniquity" or "judges' iniquity" should mean "iniquity to be punished by judge or judges"; the simplest thing is to suppose that the הוּא זָמָה and the הִיא עֵוֹן are both sayings, which are פְּלִילִים, are judges, are decisive; τὸ "τοδὲ μῦθος", καὶ τὸ "ἡδ' ἀδικία" εἰσὶ κύρια. And in

An ex-
ception
noticed.

old formulæ, to keep up an archaism of this sort is natural; the absence of that archaism throughout any book, in itself, makes it likely that that book is of more recent date than the Pentateuch. Nor can the use of the suffix ה for י be urged as of the least weight against this view; for the chances are, that the ה in that case should have a segol as in הֵ, or in Aramaic.

21. Before adding to this, proofs of a different kind, which show the author to have been later than Moses, it is worth remarking, that there are several words which, as used in Job, belong apparently to a later date. We shall notice below the words נִאֲסָף אֹפִיר מְנֻלָּה, and several others. But to keep together here all arguments drawn from mere words, let us call attention to the word תְּוֹשִׁיָּה. It occurs six times in Job, four times in Proverbs, once in Isaias, and once in Micah. The lexicographers coin a root, יִשָּׂה, for it to come from. When they have done so, there is not a single Hebrew word, it is believed, at all like it. Thus if we manufacture from יִשָּׂה a word תְּוֹשִׁיעָה for "salvation", we see at once that we have got an un-Hebrew word. Now as תְּוֹשִׁיָּה occurs first in Solomon's days, when intercourse with Egypt became common, it is not at all impossible that it is nothing more or less than the Greek word ὄυσια, with the fem. Coptic article prefixed to it; and that, whatever Michaelis Suppl. (in v. p. 1167), or Gesenius (p. 638 in v. יִשָּׂה), may say of it, it means properly "reality", "substance", "wealth", as in Greek; and that the kind of "reality" meant is determined by the context. The phrase כִּי כַפְלִים לְתוֹשִׁיָּה in xi. 6, might then be paraphrased, "for when we behold the real truth, one side with another is matched". The sentiment would then be the same as in Ecclus., xlii. 25, omnia duplicia, unum contra unum; and you have an excellent reason why Zophar should wish Job to desire to know the secrets of wisdom. For a parallel instance in Hebrew, one may be at a loss, but perhaps "Pharaoh" is nothing but "the shepherd": the Semitic root יָעָה,³ with the masc. Coptic article before it. In Greek ελ-εφας is a good sample, if Benfey's (G. W. L., i. p. 46) suggestion, that it is the Sanscrit "ibhas", with an Arabic article before it, be right. Alchemy, alembic, and other similar cases might be added. If the word אֶפְרַיִן, which occurs in Canticles,

Words of later date than Moses in Job.

תְּוֹשִׁיָּה possibly of Greek origin.

³ Too much importance, perhaps, can hardly be attached to Meier's (H. W. L., p. 728) remarks on the probable influence of early Semitic invasions in introducing Semitic words into the language of Egypt.

be as St Jerome (ad Esai., vii., 14) thought it, the Greek *φορεῖον*, we should have another instance of the importation of a Greek word at that period. But at all events, this much is clear, that when we are discussing the date of a Hebrew author, we must not assume that he used, at a very early period, a word which no other early Hebrew author used. He "might have" done so, but the probability lies the other way. And it is because it lies the other way, that it is worth considering whether historical circumstances connected with a strangely-formed word do not allow us to refer it to a foreign source. Of course where one does not think one sees such circumstances, to look for foreign etymologies is inadmissible.

The names of places and persons in Job considered.

22. Again, the names both of the persons and the places are good Hebrew. Not that this, by itself, would be of much weight, as Semitic names mostly remain petrified into certain positions for centuries. But they appear so characteristic of the persons, that Gesenius, in v. אִיב, imagined Job's name was given him *after* his calamities. And although he makes him an "Ausite Arab", allows the word אִיב to be a thoroughly Hebrew form, like to יִלִּי, and to mean "Hostiliter impetitus". עִיָּק too is possibly a synonym for עִיָּק: "stronghold" is a likely meaning for the name of a place. Eliphaz is "Gold-my-god"; and he tells Job, in xxii. 25, how rich he would be if he turned good again; nay, if בצִירֹת be "ores", in that passage, he seems to tell him that "ores to him the Almighty would be", if he repented. He is a Themanite—a southern. Zophar is "piper" (see Mover's *Opferw.*, p. 55) of Naamah, which would be in rude English, "Mount Pleasant". He represents the loss of the real pleasures of the palate which a wicked man undergoes, in chap. xx. 12. And Bildad—the bitterly cursing Bildad,—why should we refuse him a Hebrew etymology from בֵּל + דָּ = ἀμαζών? Pliny says: "Mammæ homo solus e maribus habet; cætera animalia mammarum notas tantum"—ii. 95. A "brute", therefore, might fitly be styled "Breastless" of the Pit. But the translators, by turning his curses into futures, in chap. xviii. 11, have been gentle with him, and have put feeling into the Breastless. Job's paronomasia, לֹא אִמְצָא בְּכִבֵּי הַחֵם, ch. xvii. 10, shows what he thought of them all. If any one fancied the three foe-friends to be types of the world, the flesh, and the devil, he really might find a good deal to say in his defence. Elihu, too = "He-is-my-God", of Scorn-ton, looks like the very embodiment of a pretentious



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Rahab withal: surely the use of the root *רוּב* is conceivable in an author who has several Aramaic words. This is noticed as an allusion, and not as more, although, perhaps, in the next words, instead of making “the Heavens garnished by his Spirit”, we should have, “By his wind grew the Heavens all clear”. Hebr. “were a clearness”. For he goes on: “His hand wrung a fugitive snake”. It evidently is parallel with Isaias li. 9, where *מִדּוּלֵּלִית תּוּיִן* answers to the *הִלְלָה* here. Nor does the passage want symptoms of other allusions to Exodus; for if we deny that *מִאֲחֻזּוֹ* and *פִּרְשֵׁוֹ*, in v. 9, can possibly be construed as coördinates, we must render “closeth up the forefront of his throne, when o’er it his cloud he had spread”. “*His cloud*” is an expression nowhere to be found but here and in chapter xxxvii. 15; and, therefore, the figures are such as are naturally suggested by *God’s* cloud coming over the tabernacle, and preventing even Moses from going into it—Exod., xl. 34. Nor is it at all clear that, if we keep to the ketiv, the last words of the chapter do not simply refer to the ends of *God’s* journey *דֶּרֶכּוֹ* with the Israelites, and the thunder of his majesty to the scene on Mount Sinai, in Exodus, xix.:

Lo these were the ends of his route,
In which was heard whispered his word;
But the thunder of His majesty,
Who was it that could understand?

The words *וּמָה שִׁמְרָהּ* would then be literally, And in it (his route) was heard what a whisper of his word is: and we take *קִצּוֹתָהּ* too quite in a literal sense. See Deut., v. 24, etc. But persons prepossessed with the patriarchal theory most properly and most guilelessly kept both Rahab, a name not used in many writers for Egypt, and also the turn of the tide, out of sight. Simonis, in his comparison of the ketiv and keri, even alters the form *הַיְבֵנָה* by omitting the *ו*. In ix. 13, the words “’Neath him Rahab’s assistants sunk down”, allude apparently to the same events, especially if Pharaoh did not pursue the Israelites in person, as Wilkinson (Egypt, i., p. 54) makes it likely. Again, in xxxiv. 20, we read:—

Sudden they die, and at midnight
They quail, the people: then they pass,
And sever without hand a mighty [host].

The passage is hard enough: yet, perhaps, *עִבְרִים* Hebrews,

passengers, is to be supplied to ייעברו they *pass*; and the meaning is, that men escape then, as the Hebrews did of old, and keep a mighty, or rather haughty, foe aloof from them as these did. The word עַם would then be used almost as an equivalent to πανδημεί. But in a Hebrew author it is natural, from early Hebrew history (Exod., xii.) being before his mind, to use allusive expressions of this character, and to expect Hebrew readers to supply from history what is wanting to make these expressions intelligible. Other versions evidently writhe under the words ויסיירו אביר לא ביד; they are obliged to give יסירו a new nominative, and render it as if “*the* mighty is taken away”, were the sense really intended by the author. So, at all events, to a choice of difficulties we must submit. Other allusions to Exodus might be noticed here: *e.g.* Eliphaz, in xxii. 6, taxes Job with violating the precepts of Exodus, xxii. 25, and Deut., xxiv. 10–13. Job, in xxi. 15, has in the words: “What is the Almighty, that we should serve him?” before his mind, the language of Pharaoh, in Exodus, v. 2: “Who is Jehovah, that I should obey his voice?” Elihu, in xxxiv. 2, bears the threats of Exodus, xxii. 23, in mind, applying to the cry of the poor and afflicted what is there said of the orphan and widow. An allusion to Leviticus has been mentioned already; one to Numbers, xi. 33, occurs in Job, xx. 23, where wrath is rained upon the wicked, while he is eating. and to other parts of

25. To passages in Deuteronomy several allusions occur: *e.g.* in xxiv. 2: “Why do they that have robbed a flock and fed thereon, boundaries move?” which alludes to the laws in Deut., xix. 14, xxvii. 17, against moving boundaries; and though he might have used the self-same phrase הכיג גבול by chance, it is a good deal more likely that he quoted the same. But, to cut the matter short, we shall here notice those passages, which refer to the times of the captivity in Deuteronomy, premising the fact, that there have been sceptics who thought Deuteronomy was written by Jeremias. In v. 14, then, the “groping at noon-day”, spoken of in Deut., xxviii. 29, as a feature of the captivity, is spoken of as a cotemporary and experienced fact. It is alluded to also in xii. 25, and by Isaias in lix. 10, but not with the same words as in the two former passages. The two words משש בצהרים might have come together by accident! Again, in the same chapter, verse 18, we have, “for he it is who wounds, yet bindeth up, who smiteth, though his own hand heal the Pentateuch.

again". Here, also, both words and thoughts convey an unmistakable allusion to those of Deut., xxxii. 39. In vii. 4, occurs the complaint of the captivity from Deut., xxviii. 67: "If I laid me to rest, then I said, 'When arise I?' and evening grew long". In xviii. 15, "Spread o'er his home may brimstone be", is a curse suggested by Deut., xxix. 22. In xxxi. 8-10, things, commonly indeed the lot ἐὺζώνων γυναικῶν in a siege, are noticed; but it was Deut., xxviii. 30-36, which led a Hebrew writer to notice them. The use of observing these resemblances in preference to others will appear more clearly in the sequel.

Allusion
to histo-
rical
books
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26. Allusions to the historical books will be recognized or not, according to the view we take of the Hebrew moods, and to that of the time in which Job lived, or, at least, in which the author of the book lived. We do not, of course, expect, and possibly do therefore not find them, when we identify Job and Jobab. Yet such words as "Bids the sun, and no day-break it gives", in ix. 7, do, when occurring in a Hebrew author, surely look like an allusion to what happened either in the days of Josue, chap. x., or in those of Hezechias. Where there was no theory to prevent it, the margin of Blayney's Bible refers, at the words of Habakkuk, iii. 11, to Josue at once. Again, in xv. 34, if we render, "And fire *ate* up bribery's tents", there is an allusion to the fate of Achan in Jos., vii. 25, which is destroyed by those, who render אכלה, "shall eat". In xiii. 14, the phrase "to put my soul in my hand", is a phrase which a Hebrew author would be likely to take from I. Kings (Sam.), xxviii. 21. In v. 11, "to set the lowly up on high" is a thought likely to be borrowed from I. Kings (Sam.), ii. 7. In xx. 25, the word ברק, which means lightning, is compelled to mean "a sword". Yet, as the words שלח and יצא are to be found together in Judges, iii. 22, it is possible that the author meant to say that if the wicked escapes Ehud's fate, may he meet that which Sisera met in Barak's days.

Should he scape from artillr'y of iron,
Should the brazen bow too pass him by,
When 't is drawn, and (the offal) hath come
From his body, from out of his woe
May a Barak come forth, and upon
Himself be the terrible ones!

"And *it* hath come" is said ἐὺσχημόνως in that case,



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did contain quantities of treasures. And in Isaias, xxii. 15, we find Shebna, the treasurer, making himself a state sepulchre. So that we have grounds for imagining that such things were not unusual with Jewish kings and counsellors, and have no reason to draw into the service of exegesis remote pyramids, when Hebrew customs will explain a Hebrew author. And that Job had some confidence in the saints, is plain from the bitter taunt of Eliphaz, in v. 1, "Unto which of the saints wilt thou turn?" Ewald, p. 63, notices this "bitte an höhere Geister" for his own purposes; his notice of it is here itself noticed for our purpose. In fact, Jocasta's taunt ὦ θεῶν μαντεύματα ἴν' ἐστὲ cannot more forcibly prove what Œdipus's opinion of oracles was, than does this taunt show what Job's opinion of saints was. The wish, then, to be buried near saintly men is natural in a Jew. And our author certainly did not mean to put wrongful words into the mouth of a man whom he makes God praise first and last. At least, to the mind of St. Augustine, whom here we only quote as a shrewd thinker, he conveyed this impression; for he says, in Psalm ciii. iv. 7: "Inter illa omnia quæ dixit, *nusquam* lapsus est Job; quod multi in illis verbis non intelligunt, et quædam ibi sic accipiunt quasi aliquid durum dixerit Job in Deum". If, then, we can put Job at a date, when pious kings and counsellors are known historically to have been in graves full of riches, we shall be going by what is likely. Of course, such kings in such sepulchres "might have" existed centuries before the time of "the Kings". That we may allow most distinctly, and yet prefer likelihood to possibilities. It is worth considering, also, whether in Isaias, xiv. 9, the opposite of Job's wish is not threatened to Sennacherib. There all the princes of the Earth then in Hell are represented, it seems, as rising up to meet him. The prayer of Job is to be gathered to his fathers: that Sennacherib will be gathered to his, is the threat of Isaias.

28. While on this subject, the apparently liturgical use of the word קָבַר in xxvii. 19, is not to be passed over. It is used also in Isaias, lvii. 1, alone and without the adjunct "to his fathers". It would probably take much longer to make a Semitic nation adopt an ellipse of this kind, than to make a Greek or a Roman do so. Yet as τελεῖν and τελεῖσθαι are used without the adjunct "into the mysteries"; or, as Roman Catholics say, "he was anointed", without mentioning the "oleum infirmorum";

and was
prone
to saint-
worship.

Liturgi-
cal use of
the word
קָבַר.

so do Job and Isaias say, "He was gathered", without adding the words "to his fathers". Job says:

Down lies a rich man and is gathered not :
His eyes hath he opened, and nothing is he.

If for "rich man" we put "Dives", we can hardly help thinking of one who was not in Abraham's bosom, was not gathered to his fathers, but lifted up his eyes, and found himself nothing. Nor can the passage in Isaias, lxiii. 16, where Abraham is said not to know his children, be urged with any cogency against this view of the matter, as it has sometimes been. For no one complains of the eyes that they do not taste, but of that organ from which taste is expected. And it is because the Jews did expect help from Abraham, that the prophet speaks plaintively of their not obtaining it. This, then, can hardly deter us from giving to יאסף the ritual sense here contended for. Schlottman indeed ascribes a similar meaning to the word יקפצין in xxiv. 24; but it is not desirable here to discuss that difficult passage with a view of showing that, with our theory of the moods, he must have wholly mistaken its meaning. It is enough to point out that the elliptical use to which we have called attention is more likely to have belonged to a late than to an early period of Jewish literature. It helps, in some measure, to prepare us to put Job to a date, in which several pious kings were in their graves—the more the better, of course, for our purpose.

29. Quotations from the Psalms and Proverbs occurring in the book before us, help also towards the same conclusion. And our author puts them into the mouth of the holy Job, the worldly Eliphaz, the sensualist Zophar, the sarcastic Bildad, and the self-important Elihu. Thus, in vii. 17, 18, Job uses the words *מה אנוש כי יפקדנו*..... manifestly taken from Psalm, viii. In verse 10, Job quotes the phrase *ולא יכירנו עד מקומו* from the Psalm, ciii. 16. Psalm cvii. 42, supplies Eliphaz with the thought *יראו צדיקים* *וישמדו*, in chap. xxii. 19. Zophar promises Job (xi. 6) a knowledge of the *תעלמות חכמה* if he repents, an idea evidently taken from the *בתם חכמה* in David's penitential Psalm, li. 8; to say nothing of abundant other parallel thoughts. Bildad, viii. 13, speaks of the ways of those who forget God, where Psalm ix. 18, suggests the thought, and, l. 22, the actual form of *נכח* employed. Elihu says,

The quotations from the Psalms adverted to.

xxxiv. 22, there is no darkness nor death's shade, where *פְּעִלֵי אֵוֶן* (a great phrase with the Psalmist) may hide. The thought is evidently like that in Psalm cxxxix. 12. In xxxvii. 13, he uses *לְאֶרְצוֹ* of God's *land*, just as Psalm, lxxxv. 2, does *אֶרֶץ* (he has Psalm cxlvii. plainly before his mind throughout the chapter). "On a tribe, on his land, or on piety, doth he cause it to fall", seems the sense naturally suggested by the thrice repeated *אֵוֶן*. But Blayney's marginal references will point out numberless parallel thoughts in our author and in those of the Psalms. A little pains would enable a person to collect a good number of passages where there is a nearly perfect identity of thought with a seemingly studied variety of words. A sample of this occurs in x. 8, where the words *יָדִיד עֲצָבוֹנִי וִיעֲשׂוֹנִי*, evidently contain a thought parallel to that of Psalm cxix. 73, *יָדִיד עֲשׂוֹנִי וִיכֹוֹנֹנִי*. We have then a book, many of whose Psalms are ascribed to a great king, David, and his contemporaries; and another written by an obscure regulus, so to call him for argument's sake: to ascertain the dates of all the Psalms, is certainly what no one in his senses would think, now-a-days, that he could do, without minute and laborious investigation. But the question is which of the two books contains the most matter of probably ascertainable date? In discussing the date of Job, precedence must be given to the book in which such matter exists, if we mean to be ruled by the likely, and not by the possible.

And from Proverbs. 30. As we find in our Hebrew author several allusions to natural history, and as we do not know any Hebrew author great in that line before Solomon, any little things symptomatic of his having lived after Solomon will deserve our attention. Obviously there is a vast similarity between the moral reflections occurring in Proverbs and in Job; the marginal references of either book will show that to any one. Therefore, as we notice below, §. 47, another proof that our author was later than Solomon, here we shall simply call the reader's attention to two things. The description of wisdom in Prov., viii: ix., is far too like that in Job, xxviii., in its whole bearing, to have become so without one author knowing the other. But in v. 17, Eliphaz says: "Well fares the man whom God upbraideth: And scorn not *thou* the Almighty's chastisement". The change from the third to the second person here wants accounting for. A "likely" mode of accounting for it is this: an apt quotation from



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להמם, verb,	xlvi. 14.	xxx. 4.
זרם,	xxv. 4; xxxii. 2, etc.	xxiv. 8, and by later writers.
קשה,	lxiii. 17.	xxxix. 19.
כפה,	ix. 13; xix. 15.	xv. 32.
התעורר,	li. 17; lxiv. 6.	xvii. 8; xxxi. 29.
אפעה,	xxx. 10; lix. 5.	xx. 16.
מורש,	xiv. 22.	xvii. 11, and in Obad.
הכר. perhaps, (Ges. in)	iii. 9.	xix. 3.
שוע,	xxxii. 5.	xxxiv. 19, and in Ezech.
קדוש, of God, without adjunct,	xl. 25.	vi. 10.
מנלה נלה,	xxxiii. 1.	xv. 29.
בנה,	xliv. 5; xlv. 4.	xxxii. 21, 22.

or in
phrases

Such instances doubtless might, by more careful collation of the two authors, be multiplied; but these are sufficient to prove, that one author knew the other. The use of such a root as נלה reminds one of the use the acute Hody (de Text Orig., p. 177) made of γαῖσον (cf. Orell ad Hor., ii. p. 205, Zeuss Keltica, i. p. 69), in deciding the date of the parts of the Septuagint, where it occurs. It (נלה) could not well have come in until intercourse with Syrians was common: but to comment on all these words, when one alone may be so instructive, is out of the question. We find also

in Isaias the phrase,

in Job the phrase,

xliv. 20, רעה רעה דן

xiii. 12, משלי אפר.

xiv. 9, עורר רפאים, to raise ghosts.

iii. 8, עורר לויתן, to raise the old serpent.

xxxv. 8, חזקו ידים רפות.

iv. 3, ידים רפות תחזק.

Ibid. וברכיהם בשלות אמצו.

iv. 4, וברכיהם כרעת תאמץ.

xl. 26, אמיץ כח (and in Nahum)

ix. 4, 19; comp. xxxvi. 19,

lxiv. 7. מעשה ידיך כלנו.

xxxiv. 19, מעשה ידיך כלם.

xvii. 2, הרבצו ואין מחריד.

xi. 19, רבצת ואין מחריד.

lviii. 2, דעת דרכי יחפצנו.

xxi. 14, דעת דרכיך לא חפצנו.

xl. 22, הישב על-ההיג הארץ.

xxii. 14, היג שמים יתהלך.

xiv. 27, xliii. 18, מי ישיבנה, of God's doing.

ix. 12, xi. 10, xxiii. 13, מי ישיבנו, of God.

lxiii. 1, בריב כח.

xxiii. 6, xxx. 18, בריב כח.

The following are old Pentateuch roots revived by both authors:—

or in use
of Pen-
tateuch
words

IN MOSES,	ISAIAS,	JOB.
נין ונכד, kith and kin, 1. xxi. 23.	xiv. 22.	xviii. 19.
גמא 2. vii. 3; 1. xxiv. 17.	xviii. 2; xxxv. 7.	xxxix. 24.
עיר, kal i. xxv. 21; ii. viii. 26, etc.	xxiv. 7; xix. 22 (?).	xxxiii. 26.
טרח 4, i. 12.	i. 14.	xxxvii. 11.
חלש, verb, 2, xvii. 13.	xiv. 12.	xiv. 4.
ספיה, 3, xxv. 8.	xxxvii. 30.	xiv. 19.
פליל, adj. 2, xxi. 22; 5, xxxi. 31.	xvi. 3; xxviii. 7.	xxxi. 11, 28.
חוח, 2, xxxv. 22.	xxxvii. 29; Comp. xix. 8.	חוח, xl. 21, same sense. חכה, xl. 25.
חומר, bitumen, v. t. a. 1, xi. 3; 2, 1, 14, etc.	xli. 25; xlv. 9; lxiv. 7. and in Nahum.	iv. 19; xiii. 12. xxvii. 16; xxxviii. 14.
ארחיה, viatorum caterva, 1, xxxvii. 25.	xxi. 13.	vi. 19; xxxi. 32.
חרב, kal. to dry up, 1, viii. 13.	xix. 5, 6; xliv. 27.	xiv. 11, in same phrase.
יענה, 3, xi. 16; 5, xiv. 26.	xiii. 21; xxxiv. 13.	xxx. 29.
מתים, men, 1, xxxiv. 30; 5, iv. 27.	iii. 25; v. 13; xli. 14.	xi. 3; xix. 19; xxiv. 12, etc., raro alias.
Without מספר	5, ii. 34.	

Exceptions may be taken to some of these instances, of course; but it would be endless to anticipate the objections of the ingenious. The use of שור for “a breast” in Isaias, lx. 16, and Job, xxiv. 9; of שוט for “a scourge”, in the moral sense, in Job, ix. 23. Isai., x. 26: of חרוץ Is., x. 22. Job, xiv. 5 for “decided”, of השלים for “finished”, Job., xxiii. 14. Is., xlv. 26; of יהל for “to cause to shine”, Job, xli. 10. Isai., xiii. 10; of בדים for “lies”, Job, xi. 3. Is., xvi. 6 may be noticed as words used in a peculiar sense by these authors, and by none before them. The following are ideas common to the two authors: Job, xxi. 12, describes men feasting, with timbrel and harp, and being dashed into Hell. Isaias, v. 12, 14, ascribes the same fate to men feasting with the same instruments (and others). The idea of putting on justice and being clothed with it, in xxix. 14, is taken from Is., lix. 17—lxi. 10. The prophet’s, כלי גמא, xviii. 2, is the same combination of ideas as the אניית אבה of our author, cap. ix. 26. Leviathan is used in Is., xxvii. 1, as the symbol of some hostile power, whether of Babylon or of Antichrist is nothing to us now;

or in
common
ideas.

simple poetical justice sternly forbids us to suppose that our author would introduce the Creator of all merely boasting of the monsters he can rule; and so no doubt Leviathan is in him too a similar symbol. The idea of almsgiving in Job, xxix., xxx., as that from which mental illumination in tribulation may be *expected*, is precisely that given in Isaias, lviii. It is a Jewish notion (compare *Cassel's Juden*, p. 38, in *Gruber and Ersch*), and not a classical one. Mohammedan imitations of it might possibly be found. Job, xvi. 17, has על לא חמס בכפי. Isaias, liii. 9, has על לא חמס עשה: in which passages alone Gesenius gives to על the sense of "quanquam"; but the three first words can hardly have come together in both fortuitously. Job, xxx. 10, has, "they refrained not to spit in my face". Isaias, l. 6, "I hid not my face from shame and spitting". Whether the prophets said this of themselves or of some other man, is a devotional question, not a critical one; but when all these peculiar words and phrases and ideas occur in two authors, criticism will surely induce us to suppose that one borrowed from the other.

33. But, as it was observed above, that we want as many pious kings as possible in their graves before Job's time, a translation of the hymn of Hezechias may, perhaps, be excusably hazarded here. To do battle for all the items of it would take too much space; but as it is offered with a view to making out a parallel between Job and Isaias, the reader is requested to be on his guard. For although a translator's intentions be ever so honest, he is likely to be misled by a theory. One main object of this essay is to show this very thing, viz., that the theory about Job, which the translators have had, has misled them. It would, therefore, be presumptuous to claim for oneself an exemption from the like human weakness: but with this theory in one's mind, Hezechias appears to speak as follows:—

Myself had said: Oh! let me go in midlife to the gates of Hell!
 Muster have I already passed for [all] the remnant of my days.
 Shall I not, said I, see the Lord, the Lord i' th' region of the quick?
 Shall I not Adam yet behold with those that dwell in quietness?
 For my own times—they 're moved from me, and folded like a shepherd's tent.

Up have I wound my life, as though a weaver cut it from the yarn.
 And thou from day to night wilt close my course!

Till morning was I thinking, "He will, lion-like, crush all my bones".

And thou from day to night wilt close my course!

I, as collected swallows do, would chatter, murmur like a dove!

Heze-
 chias's
 hymn
 may be
 so trans-
 lated,



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in limbo there is no such need. That need I can now teach my children. I accept with public thanksgiving the life which enables me so to do". This paraphrase, it should be owned, cannot hold, if we view Judaism from a Sadducaic "standpunckt"; but the critic and the antiquary can hardly deny that from a Pharisaic "standpunckt" there is nothing absurd in it. The language of strong emotion always requires some filling out to make it consecutive; and actual sentiments of holy men generally present them to us, when we can get at them, in brighter colours than a historical record of their outer actions would have induced us to suppose. He who shares these thoughts and has some little knowledge of the Jewish prayer book, as a source whence an antiquary may draw some idea what Jewish devotional feelings are, will per a s not be offended at this attempt to exhibit the hymn of Hezechias as a consecutive whole.

as to
make it
strongly
resemble
part of
what
Elihu
says.

35. In the xxxiii. chapter of our author we find a passage containing some curious specimens of the liberties the *keri* can take with the *ketiv*. This, be it observed, is not the least impeachment of the faithfulness of the Jews: for, in the "written" text the consonants are preserved, though the points suited to the "read" text are introduced. Here, as in other instances, we shall adhere faithfully to the *ketiv*: we shall translate the affixes of the first person as those of first person, and not as those of the third. To be enabled to do this, we shall introduce inverted commas where we conceive a new speaker is introduced; we shall have also to make, as is frequent in Hebrew, the same pronoun mean different third persons, as *e.g.* in "When *they* arose in the morning, behold *they* were all dead men". In xxxiii. 15 and the following verses, we shall thus get the following passage to parallel with the hymn of Hezechias, alluded to also in earlier chapters of our author, *e.g.* vii. 6, 11; x. 1.

Trans-
lation
of that
part.

In a dream, in a vision of night,
When deep sleep on mortals doth fall,
In the slumbers that happen on bed,
Ear of mortals then openeth He;
To their chastisement setteth a seal:
That a man may lay business aside;
Body [’s presence] he hideth from man;
Yet withholdeth his soul from the pit,
And his life from a close by the dart!
Yet hath he been chastened with pain
On his bed, and the law-suit his bones
Plied against him protracted became.

And his life had no relish for bread,
 Nor his soul for the food which he liked,
 While his flesh was consuming from view,
 His bones chafed unheeded away.
 So his soul did approach to the pit,
 And his life to the slayers of men.

If o'er him an Angel there was,
 One ambassador out of a troop,
 To tell Adam of his good life,
 Then pitied he him, and exclaim'd:
 "Him redeem from descent to the pit,
 "I have found [me] a ransoming trait;
 "All florid with youth was his flesh;
 "To youth's days, oh! let him return:
 "Let him offer his pray'r unto God".
 So [God] did accept him, and he
 With merry shout God's presence saw,
 Who to mortal his justice restored!

When to mortals he look'd [Adam], said:
 "I sinned and perverted th' upright,
 "Yet the punishment due unto me
 "Was not mine; for myself he redeem'd
 "From passing o'er into the pit:
 "So my life, it shall gaze on the Light!"
 See all of these things God will do,
 Twice, yea, and thrice too, with a wight,
 To bring his soul back from the pit,
 To be lit with the light of the quick!

36. We find from II. Paral., xxxii. 26, that wrath did come a second time upon Hezechias, and that he repented again: consequently, the mention of God doing this "twice or thrice" does not prevent this passage from being suggested by the history of that king. For we have here a man musing upon his bed, as Hezechias was, thinking till morning. Here is also a deep-seated chafing of the bones, such as the pious king complains of. Here is the advocacy of Adam in the region of the quick (the Bitte an höhere Geister above, §. 27), of which Hezechias is, by the translation above given, made to bethink himself. Here is the dart thought of, for the procuring of which in abundance, Hezechias is celebrated in II. Par., xxxii. 5. Here are the slayers of men, the troops of Sennacherib, or, if you please, the destroying angels, such as were represented as destroying Sennacherib's army, and suggesting by contrast the mention of the good angels: here is the *מיליך*, which word St. Ephrem (no mean judge) understands in this sense in chap. xvi. 20. Like to this is the office ascribed to angels in Luke, xvi. 22, or even in Plato.—Döllinger *Heid-und Jud.*, p. 89; and Wetsten in *Luc.*, *l. c.*, will show that neither Platonist, Jew, nor Christian can quarrel with such a notion. Here is the

Reflec-
 tions on
 this
 transla-
 tion.

אמת ולב שלם (comp. v. 3) pleaded by Adam as the *אמת ולב שלם* is by Hezechias in Isai., xxxviii. 3. Here is the *חשבתה* of Hezechias and the *יחזק שפשו מני שחת* of our author. All betrays an author who had seen the writing of Hezechias. Well might Job, who was doubtless aware of Sennacherib's fate, admonish his friends by an allusion to the death of Hezechias' enemy, xix. fin.:

Oh! fear ye a sword for yourselves,
For wrath, a sword's wrong-doings are,
That ye may learn that Judge there is.

But had we space, other passages might be so translated as to seem to have that monarch's end in view, *e. g.*, the close of xxi. and xxiv. We might also discuss the details of the translation above given, and defend each item of it. It will be enough to point out that *להסיר אדם מעשה* is translated without injecting absent pronouns; that *גוה* is not turned into *גאוה*. Above all, the faithful Ketiv is adhered to.

Job
quotes
Isaias.

37. Now that all these marks of a knowledge of Isaias have been put together, one single and tolerably well-established case of quotation ought to lull all suspicions that the prophet might have taken from our author, and not our author from the prophet. The reader is requested to consider the following passage from xii. 7:

Anyhow (וְאֵלִים) ask Behemoth, and she
Will teach thee; ask birds of the air,
And they will declare unto thee;
Or to earth talk, and it will teach thee,
And fish of the sea preach to thee!
Who knows not that in all of these
'Twas the hand of JEHOVAH did this?

Let us put a parallel case:—suppose a man got a scroll from Herculaneum unrolled, and found it to contain the work of some philosopher in whom there were a number of words which were great favourites with Aristotle, a community also of thoughts and phrases, such as we have noticed in the two authors under consideration,—but a studious avoidance of the word *φύσις*,—so studious, that when he quoted a passage, say from Pindar, he changed it for some other word. Suppose that we had begun to suspect he was later than Aristotle, when at last we came upon the following sentence: *Who knows not that in all of these, 'Η φύσις οὐδὲν ποιεῖ μάταιον?* This, I think, would settle the question. We should say the author re-



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terpart
to the
capti-
vity,

Romulus's time as a Job in patriarchal times. Demosthenes is not more ἀντίστροφος to the rise of the Macedonian dynasty, than Job is to a captivity. When we have started this question, how shall we answer it? is it to be by making out what "might have" been in the days of Chedorlaomer, or by considering whether there are any things in the Book itself which render such an assumption "likely", or rather which confirm its already demonstrated likelihood? Here the latter course will be preferred. We shall leave the εἰκὸς τυγχάνειν οὐκ εἰκότα to other hands.

but was
not
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into He-
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40. But before we go on to these internal proofs of Job's date, let us endeavour briefly to crush a suspicion which might arise in an English reader's mind. He might think that the book was perhaps translated out of Heaven knows what language in Ezechiel's days, but existed long before. If so, all we have said is nonsense. We might as well suppose Shakspeare was translated out of Icelandic in the days of James the First. The whole current of thought, the quotations and references to Jewish authors, the names of men and places, the paronomasiæ employed, are all thoroughly Hebrew. We have only to imagine all the rest of Hebrew literature lost, and we shall see that Job would then become a perfectly unintelligible book. That stiffness which clings to translations, *e.g.*, to Ecclesiasticus or Wisdom, is entirely absent. Nor can the case of Matthew's gospel, said to be written in Syriac, and afterwards doctored to suit a Septuagint-reading public, be urged as furnishing a possible parallel. For Origen, who was the best informed upon the subject, only says that it was in Syriac letters γράμμασιν Ἑβραϊκοῖς συντεθειμένον; and therefore it may have been written in the Greek language, but in Syriac letters, which deceived the far sillier Papias. But let us proceed to look for traces of captivity in the book itself.

Mat-
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affords
no paral-
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41. We could not, conformably with a correct taste, speak of Moses crossing the Rubicon. After the Rubicon has been crossed for a decisive step, and not before it, is it proper to draw metaphors from that fact. Even now it would be bad taste to apply such a phrase to Moses' passage over the Red Sea. For metaphors, to be properly applied, must be such as suit not only the author's date, but the date of the characters whom he introduces. When dramatists in Spain or in England put into classical mouths metaphors drawn from the Christian system, obviously this is a piece of bad taste. Thus when Shakspeare talks of

the “scriptures of Leonatus” (a heathen) being “all turned to heresy”, we are offended at the anachronism of such a figure of speech. Equally grotesque would it be in a Jewish author, after quoting the principal Jewish authors up to the days of Isaias, to talk of Jehovah *turning the captivity* of his hero, as a metaphorical expression for “restoring him to his former position”, unless by that time captivities had become common. The likely thing for a writer of pure Hebrew to do, is to draw metaphors from events known to his countrymen, as well as to quote proofs from books known to them. Now, such a phrase as יגל ויבול ביתי in xx. 28,—“To captivity go his home-growth”,—might be noticed as a metaphor of this kind; but when in chap. xlii. 10, we find it positively said that Jehovah “turned the captivity” of Job, surely, as he had not been in captivity in any proper sense, the phrase is an unnatural metaphor in a Jewish author, unless captivities were common in his day. It is upon the phrase, as a metaphorical one, that we are here insisting. As a literal phrase, though exceedingly rare in old times, it is as old as those captivity-chapters of Deuteronomy so often before our author’s mind. The Septuagint makes it ἠύξησε τὸν Ιώβ; Lyddæus, Jerome’s Jew, helped him to “*conversus est ad pœnitentiam Job*”. Of course *if* they held the patriarchal theory, a critic must suppose that they would *a priori* be likely to give the passage a good wrench to make it square with that theory. But no critic would endeavour to conjure up various readings, to break the neck of a difficulty such as these translators, by so translating, evidently prove that they felt. When a man has a theory, it may not interfere with the staple of his duties as a translator; but it is mighty likely to interfere with his handling of a telling metaphor in the “Hebrew reality”, fatal to that theory; likely too to make him lean to the semblance of a reading which favoured his own views. Thus suppose a translator of Shakspeare to believe him to be a Roman Catholic, the reading “unhouselled, unanointed, unannealed”, would seem to him a pleasant alliteration alluding to the three last sacraments. A man who took the opposite view would accept with Delius the reading, “disappointed”. If, however, we think “Job” a well-timed production for the days of the captivities, the metaphor will also strike us as highly appropriate.

Meta-
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drawn
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imply
the exis-
tence
of, capti-
vity.

42. Again, from Jeremias (xxv. 20, 23) we find that in those days the kings of Uz, Buz, and Thema, were to be The stul-
tification

of Uz, Buz, and Thema, spoken of in Jeremias,

“stultified”, יהוהוללו (verse 16). In Job, xii. 17, we find the following words:—

“Misled and misleader are his;
 ’T is he maketh counsellors go
 Barefooted each of them away,
 And judges he thus *stultifies*.
 Punishment hath he taken off kings,
 And a belt on their loins so hath bound.
 ’T is he maketh priests also go
 Barefooted each of them away,
 And the long-stablished so overthrows.

alluded to in Job.

Now, object as you may to this version, it is three to two that Jeremias and Job are speaking of the same event; it is Uz, Buz, and Thema, to Naamah and Shuach. Three of the countries mentioned in our author incur stultification in Jeremias; certainly the chances are that they are speaking both of them of the same event. We shall see below that a principle of fellow-feeling may have actuated our author and his cotemporary Jeremias in cursing their day. But by translating מוליך, יהוהולל, and פתח, as if they were coördinates, you refer them all to one and the same stamp of events, which, of course, the theory of moods, hereintofore contended for, prohibits. A paraphrase will put the reader in possession of the view of the passage here adopted. “Both deceiver and deceived are in God’s hand. We have known him allow to be led off into captivity our own counsellors, and seen how misled the judges were in consequence. The way in which Jehoiakim was served by Merodach Baladan, shows that God can also lift up the captive again, and set him on high among the princes. (The orist mood refers to something definite.) Priests also get carried off in the same manner; and the long established νεώκοροι get in consequence ejected from their places”.

Observations on the passage of Job.

43. The idea of “priests” existing wholesale and for transportation in patriarchal times, was too much for the generally literal Anglican version; they therefore rendered the word “princes”. But *if* כהן is really a substantive, and not a participle, in the very few passages where it *must* refer to a layman, surely we have no right to force an extraordinary sense of a word upon a passage where the ordinary one will do. The obliging Pineda furnishes us with facts which even he sees are *parallel*, from Jerem., xiv. 18; Lam., ii. 6; Isaias, xxii. 15 (add to these, Is., xxiv. 2; Jerem., xxix, 1, 25; xlviii., 7; xlix., 3); and which may be regarded here as *cotempora-*



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Astro-
nomy an
importa-
tion from
the Chal-
dees.

Amos's
mention
of con-
stella-
tions.

45. Another symptom of the influence of Babylon is to be found in the calling of stars by their names, which we do not meet with in Hebrew authors before the times of Isaias. The Psalmist ascribes this to God alone, cxlvii. 4. Thus in Isaias, xiv. 12, we find the name הַיְלֵל for Lucifer according to tradition. The form and the word stand alone in the Hebrew language, insomuch that Hitzig (ap. Ges. Lex. in v.) wished to alter the form into הַיְלָל . The word כַּסְיִלִּים also occurs in Isaias, xiii. 10, apparently with (at least) an allusion to astronomy. Ideler (Urspr. der Stern-Namen, p. 265) says that the shrewdest interpreters take it to be a general name for bright stars. Amos, too, has the words $\text{עֲשָׂה כִּימָה וּכְסִיל}$, which words Ewald (in Job, p. 62) thinks it unlikely that an unlearned shepherd should have lent to our author; rather he would have borrowed them from him. From Ezech., xvi. 28, we see that the intercourse of the Jews with the Chaldees was later than that with Egypt. Indeed, a Greek papyrus given in Seyffarth's *Beiträge*, p. 212, states that Egypt got its astronomy from ancient $\text{σοφῶν, τούτ' ἐστὶ, χαλδαϊκῶν}$. And Isaias, xix. 11, tells us that the Egyptian boasted their descent from these מַלְכֵי קֶדֶם . A little pains might enable us to show that the traditionary names of the three kings—Caspar, Balthazar, and Melchior, are good Chaldee. Isaias, xlvii. 9, 13, teaches us that that sort of knowledge was at once their pride and their ruin. It is hardly worth making such statements except in order to help us to make it more probable still, that a pure Hebrew author, who has got names for four or five constellations, and believes in their secret influences, lived after, rather than before the times of the prophet we have supposed him to quote. Against this the passage in Amos, v. 8, certainly makes a difficulty, as he was an earlier writer than Isaias. But then the numerous parallels between our author and Isaias must be set against this difficulty. They tend to show that Ewald's suggestion is not worth much. Neither is there the same objection to supposing the words of Amos to be a short formula current in the schools of the prophets, that there is to such a supposition in regard to the use of the passage of Isaias with the word Jehovah in it. The passages in our author, ix. 9, xxxviii. 31, etc., must stand then as witnesses in favour of a late date for his work. It is worth adding, that as Solomon does not seem to have possessed a knowledge of astronomy, so neither does he ever use the word כַּסִּיל in its astronomical sense. Ideler, l. c. p.

xlvi., and p. 410, points out how the Arabs coined as well as borrowed names for the stars; so that it is not absurd to suppose Chaldeans doing the same, especially as it is not easy to find a *good* Hebrew etymology for any one of the constellations mentioned in our author; yet, if the names came from Semitic pagans, to borrow the inventions of Greek pagans in translating those names, is scarcely as shocking as some seem to have thought it. We might add to this, perhaps, an apparent allusion to the mansions of the moon in Bildad's לֹא יֵאָהֵל, xxv. 5, "does not pitch her tent", or does not go through her mansions. But as יְהוָה and other cognate thoughts occur in our author's favourite writer, Isaias, xiii. 10, so perhaps the traditionary is better than the etymological interpretation of יֵאָהֵל, although it is the sound, rather than the letters, which suggests the idea of giving light. Still, as, in five other instances, our author uses טָהוֹר of ethical not of physical purity, Gesenius (in Isai., ii. p. 529) seems justly to parallel what Bildad there says with Eliphaz's horrible assertion, that His (God's) angels are not pure, and to explain the passage by reference to the heathen notion that the stars were animate (compare Pineda on iv. 18; Schwegler ad Aristot., Meta., p. 991, s. 16; Noris Vind. Aug., p. 1024). The worshipping of the sun and moon, mentioned in Ezech., viii. 16, and Jerem., xliv. 25, as common in their days, Job, xxxi. 26, speaks of as a temptation which he had resisted, as a good Jew was bound to do (Deut., iv. 19), which "might have" been a temptation even in early ages, but is sure to have been then, when intercourse with Chaldeans was common. Other astronomical influences might perhaps be found in the use made of the words "Rahab" and "Leviathan", and נִחַשׁ בְּרִיחַ. But, on the whole, enough has been said to show, that if we wish to free our author and the characters he puts before us from anachronisms, one easy mode of doing so, is by putting him and his hero near to the times of the captivity of which he speaks.

Other
astrono-
mical al-
lusions.

46. Moreover, we see from Sextus Empiricus *Hy-* Horo-
potyp., iv. 4, §. 346 sq., and from Censorinus, cap. viii., scopy
that the Chaldeans brought this astronomy to bear upon may
horoscopy. This would have led them to a minute ob- have
servation of the stages of fetal life.⁴ The heathen, as we supplied

⁴ Compare Flügel in the last number of the *Zeit. d. deutsche morgenl. Gesellsch.*, p. 11, § 11, vol. xiii. *Die Ausbildung der Fœtus*, etc.

may infer from Hippocrates, p. 254, 5, or Aristotle's Politics, viii. 16, or Clemens Strom., ii. 92, p. 477 Pott., had no scruples about the style of anatomy required for this purpose; they were far more likely to have made experiments in this line than the Jews were. The words of Psalm li., *בְּחַטָּא יִהְיֶה מִתְּנִי*, imply, as the passage of Job x. does, the presence of a "me", a human person, from the first. The law in Exodus, xxi. 22, which the Greek version forces to tell against this view, may easily be explained as a penal law, which merely lays down a practical test as to whether the fetus was animate, and so is not a law implying a scientific statement of the contrary theory. But few persons now-a-days will pretend that Hebrew authors had the gift of anticipating in distinct and clear statements such knowledge as results from experimental inquiries. The results either of astronomy or anatomy might of course be used by a person who had not the slightest belief in that connection between them which was entertained by a caster of nativities. Yet the Chaldees are very likely to have got at the former through their belief in the latter. In this way, then, the well-known passage in Job x. 10, beginning in the Vulgate with *Nonne sicut lac mulsisti me*, may be easily explained. The following passage from Censorinus *De die Natali*, cap. xi., will put before the reader a clear parallel from an author not unlikely himself to have derived his knowledge from the same school: for we learn from Juvenal, Sat. ii., 554, that Chaldeans swarmed in Rome; and that Censorinus knew their doctrine, is evident, not only from the rest of his little work, but from the very chapter here referred to, although he gives this statement as that of Pythagoras, himself perhaps an adept in Babylonian numerology. But omitting these last, we find the following statements in Censorinus: *Quod ex semine conceptum est sex primis diebus humor est lacteus; deinde proximis octo sanguineus. . . . tertio gradu novem dies accedunt jam carnem facientes. . . . tum deinceps sequentibus duodecim diebus fit corpus jam formatum.* And again, he speaks of *lacteum conceptionis fundamentum semen in sanguinem vertitur xxxv. diebus infans membratur*; and of the agreement of these with the statements of the Chaldees. Of the mention of "nerves", *גידים*, too much must not be made: probably "muscles" is what is really meant, as the distinct notice of nerves belongs probably to much later times. See Schubert G. d. Seele, p. 186;

Job
with his
know-
ledge of
fetal life.



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in its native soil, and produces a great abundance of derivatives, the chances are that *ⲙⲉⲧⲁⲗⲗⲁ* is some kind of pluralis fractus, intended to represent the Greek plural, *μέταλλα*, far more commonly in use for a mine than was the singular, *μέταλλον*. And as there is some reason to think that all the mining processes known to classical antiquity were originally learnt from Phœnician sources (see the Art. Montes in Pauly Real-Encycl. v., p. 143); as, moreover, we know from Diodorus Sic., iii. cap. 11., what in Egypt was the policy, probably adopted from the Phœnicians, namely, to employ foreign slaves as task-masters in the mines, that, if the gang complained, their complaints might not even be understood; as besides, we know from Aristotle, Polit., i. 11, that there were in his days so huge a number of ramifications of “metallurgy” as implies a long-continued knowledge thereof among the Greeks; as we also know from Ezechiel, xxvii. 13, that Javan = Greece furnished Tyre with slaves; as also Aristophanes, in his Plutus, 521, showeth us that there were in Thessaly abundance of *ἀνδραπόδισταί*,—there is no reason why Greek slaves should not have been employed in some mine or other known to Job and his friends. This would account for the existence of a Greek word, *μέταλλα*, or *ⲙⲉⲧⲁⲗⲗⲁ*, in an author whom Ezechiel knew of. It does not seem impossible that miners should have

Pape. G. Wörterb. twisted the unusual word *μίτυλλον*, a lump, into *μέταλλον*, and that the plural, *μέταλλα*, should have then been used for “a mine”, somewhat in the same way as *οἱ ἰχθύες* was used for the “fishmarket”. But it does seem impossible that *μέταλλον*, which was never used for “metal” until a late period, should come from an Arabic word signifying “to draw out”; for ductility belongs not to the unwrought ore, but to the produce of it. If then we compare a hippopotamus’s bones to “a mine” of iron, we shall have at least as good a comparison as those have who compare them to a “plate” or “bar” thereof: but the simile here, like the metaphor noticed in §. 41, will then lead us to times when Greek slave-dealers frequented Phœnician markets. Compare Joel, iv. 6.

The mining processes mentioned

49. What we know of ancient mining is chiefly drawn from Greek and Latin sources, and chiefly concerns Spanish mines; but although Diodorus, v. 38, iii. 13, leads us to suppose the mines to have been *ἀρχαῖα παντελῶς* we must recollect first, that a state of mining skill such as existed in the days of the captivity would have been

to Diodorus exceedingly ancient; and secondly, that the more advanced a state of that art is, as described in an unknown author, the later that author ought to be put. If then we can bring forward a passage in Job in which there is every appearance of allusion to most of the processes of Spanish mining, made known to us by the aforesaid Greek authors or by Pliny, the reasonable thing to do is, to put Job as near as ever he possibly can be put to the date of the Spanish mines, and not as far off as ever he possibly "might be". Quarrel as you may with portions of the translation here given, it is not "likely" that so many coincidences between Job and the aforesaid authors could exist, if there were a huge number of centuries between them. After saying, then, that iron from stone is taken up, and molten stone becometh brass, chap. xxviii. 2, he proceeds:—

"End to the darkness hath man put :^a
 " 'T is he that to all corners pries,
 " For stone of darkness and death's shade".^b

With this (a) compare Pliny's words, xxxiii. 4, "Cuniculis per magna spatia actis cavantur lapides ad *lucernarum lumina*, or those of Diodorus, iii. 11. *λυχνούς ἐπὶ τῶν μετώπων πεπραγματευμένους περιφέρουσι*, of Egyptian mines, *ibique* Wessel. On (b) compare what Strabo, iii. p. 147, and Athenæus, vi. p. 233 (or 396-7, Schw.), cite from Posidonius: *ἐλπίζοντες . . . ἀνάξειν ἐκ τῶν μυχῶν τῆς γῆς αὐτὸν τὸν Πλουτῶνα*; or what Pliny, *ibid.*, says: "Manes trahuntur ab homine". To proceed:

"A stream hath severed from the grit
 "Those particles the foot passed o'er;
 "They hang: by feeble man are shook".

To give γ_2 the sense of *κομία* with the Septuagint, is what the passage requires and etymology permits, see Meier, H. W. L., p. 113— $\text{מְשִׁיבֵי הַיָּדָיִם}$ is here made to mean literally "the forgotten from the foot", *i.e.*, those lumps which are too small for the foot to scuffle out of the loose grit, are washed out. Strabo says, l. c.: *τὴν συρτὴν βῶλον κοσκίνοις εἰς ὕδωρ διάρτασθαι* (יָדָיִם); and a little before, *σκαλίσι διαμῶσας πλύνειν γυναῖκας*, שִׁבְיָהּ (of Polyb., xxxiv. 9); and Athenæus says, *ἄνδρες ἀσθενεῖς δι᾽ στᾶσει*, in which he is confirmed by Diodorus Siculus, iii. 12, who ascribes a similar duty to the women and older men employed in Egypt. The washing by the stream, מֵעִם הַגְּרִיטָה "from with the grit", is mentioned by the same authors; *e.g.*, Diod., v. 27, says, *διὰ τῶν ὑδάτων τῆς*

in our author imply a late date.

It is *ελεπιζόνσης τῆς πλιονεξίας* — but I clipped it short on purpose.

φύσεως τὸ γεῶδες πλυνάντες, “after washing away with water the earthy part (grit) of the natural product”. Job goes on:

“’T is earth from which bread cometh forth,
 “ Whose under parts change like a fire :
 “ Her stones are sapphire’s dwelling place,
 “ And to it cling small grains of gold”.

Here is perhaps an allusion to the deleterious effects of mining on vegetation; for mining, the hills (Pliny says) “*coguntur fertiles esse*”, but for crops are barren; and he intimates that “in *oriente*” ore was found, “*sapphiro scintillans*”, as if on purpose to prevent our surmising that Job had had a trip to Tarshish himself. The words “like a fire” represent the parts below the earth, as fire, “*superpositus cineri doloso*”. Pliny, xxxiii. 6, tells us that there was an “*odor ex argenti-fodinis inimicus omnibus animalibus*”. Lucretius, vi. 808, cited by Casaubon on Strabo, and Strabo, iii. 8, p. 146, confirm this statement, which will prepare us for the following words of our “so called” patriarch:—

The
 greediest
 animals
 avoid the
 odour
 of Job’s
 mines.

“’T is a path which the eagle knows not :
 “ Nor a vulture’s eye ever hath kenn’d;
 “ Which the lynx’s young never have tracked,
 “ Nor a jackal alighted thereon”.

He proceeds:—

“’Gainst flint-rock his hand hath he set,
 “ Hath overturn’d mounts from their base.
 “ In rocks hath he cloven out rills”.

Tunnels
 and other
 counter
 works in
 them.

D. Siculus, v. 27, mentions the breakage of *μεγάλους κολωνούς* in some mining districts, in order to obtain ores. Strabo says, *σχιζομένων λίθων εύρίσκειν βωλάρια*; and Pliny, xxxiii. 21 (quoted by Schlottman) speaks of the crash of mountains; and Siculus, v. 37, tells us how they “clove out rills”, *ὀρύγματα πλάγια*, to carry off the water which got into the mines. Whether our author knew of the Egyptian pumps, which Siculus describes in the foregoing chapter, we need not discuss; but the troublesome oozing of Diodorus’s underground streams, Job’s miners must have got over in some way. For he adds:—

“ All that ’s precious his eye hath beheld;
 “ From oozing (מבב) hath held rivers back,
 “ And brought hidden things so to light.
 “ But for wisdom, oh! whence is she found?” etc.

These processes seem to indicate a later rather than an earlier stage of the art of mining. One word more, and we have done this part of our subject. Job’s daughter



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in the
captivi-
ties.

to urge such a notion upon our author's hero as much as they do. It looks, to use a modern phrase, quite "doctrinaire", and is far more wonderful surely than to suppose that Job himself looked for some distant Goel, be that Goel a Redeemer, in what sense you please, in a Jewish or some other sense.

Counter
objec-
tion:
Job
has no
horses.

51. However, before we answer to such objections, drawn, as we have said at the first, from what is negative, and not from what is positive, let us just reflect that there are some negative things which may be urged the other way. In Job's live stock, then, there are no horses, and yet he is not ignorant of the value of the war-horse. Does the latter end of the book forget the beginning? Is an "Ausite Arab", living evidently amongst predatory tribes of Sabeans and Chaldeans, or, at least, within the reach of those migratory robbers, so likely to have no horses, as a pious Jew would be? The pious Hezechias is taunted by Sennacherib, Is., xxxvi. 8, with his want of horses: in Isaias, xxx. 16, and xxxi. 1, fault is markedly found with reliance on horses (compare Ez., xvii. 15). The laws of Moses on that head, then, were not yet considered by pious Jews to be obsolete: why should Job, who is represented as quoting Isaias, be assumed to differ from Hezechias in this respect? And Job had seen some service too; for, in v. 20, Eliphaz speaks of God having delivered him (יְהוָה not יְהוָה) from the grasp of swords. Make Job a pious Jew, and the reason why he had no horses is clear at once; make him a patriarch, and what sensible reason can you assign for his not riding a spirited war-horse, inasmuch as the author has described one? And it is a single horse, too, to judge from the description, and therefore not a pair of chariot horses, such as the very ancient *μωνύχες ἵπποι* were wont to be. Thus Pharoah, in Gen., xli. 43, mounts Joseph on a chariot: Haman, in Esther, vi. 8, proposes a single horse for a similar purpose. Comp. Zech., x. 3. Negative arguments, then, are two-edged swords, and the objector should be as much upon *his* guard against them, as we need to be.

Absence
of the
word Je-
hovah in
the dia-
logue.

52. But, it will be urged, God is made to say, in Exodus, vi. 3, that He was not known to the patriarchs by the name of Jehovah; and surely this makes it pretty sure that an author, who, in the dialogue, represents his characters as abstaining almost entirely from that name, intended (whenever he lived himself) to represent his

hero as living in patriarchal times. Unfortunately, however, the passage in Exodus, if so understood, is contrary to fact; for Abraham not only knew God by that name, but called places by it, *e.g.*, יְרוּחַ יְיָ, Gen., xxii. 14. Opinions on the subject may be seen in Welte's excellent tract "Das Nachmosaisches im Pentateuch", p. 83, sq. The simplest solution of the difficulty which occurs to us is that which makes much of the fact, that the Niphal לֹא נִדְעָתִי is not a passive, but a reciprocal—*i.e.*, does not state that God *was* unknown to them, but that, when he appeared to them, he himself did not *make* himself known by that name. But, be this as it may, the occurrence of that assertion in that place shows, that the use of that particular name has some reference to the peculiar position of the Jewish commonwealth. If, then, a Jew was living away from home, or was addressing people who had discarded, or held but loosely to, the Jewish faith, it would be proper for such a Jew to drop the term. Hence in Ecclesiastes (which seems to have been written by Solomon, after the purity of his Hebrew had suffered from long intercourse with foreign women, in a fit of repentance, such as one may not unreasonably suppose he had at times) the name Jehovah is dropped, without its having the slightest pretensions to being a patriarchal book. It may have been written to reclaim infidels, by bringing before them the exceeding mysteriousness of even the external aspect of things. And if Job was intended as a book of devotion for people in the circumstances of Ezechiel or Tobias, there might be good reasons for making a secret of a name, in the use of which, the Psalms for instance, might be said to revel. In Jeremias, xliv. 26, we find it asserted that God's name should be no more used in Egypt; and however we explain this, certain it is that ὁ κύριος, or אֲדֹנָי was substituted for יְהוָה or ὁ ὤν. Simple and grand as the latter name is, as matter of fact it fell more and more into desuetude in proportion as the Jews mixed with heathens. If, then, "Job" was intended for Jews under such circumstances, the fact just noticed explains the omission, without making a patriarch of an author who quotes the Psalms, and Proverbs, and Isaias.

53. But, it will be said, Why are there no direct appeals to the law? such appeals would surely have been effective weapons to such sturdy Shylocks as Job's friends were, to prove that "thrift is blessing". But, perhaps, the same reasons which would induce a Jew not to mention

A theory to account for this absence in Ecclesiastes;

and in Job.

The law is not

the testimony, however, is appealed to.

Jehovah, would induce him not to mention the law: which would prove too that the sacred name *has* relation to the theocratic system of the Jews. At all events, the books which avoid the one avoid the other also, as Canticles, Ecclesiastes, and Job. Yet surely Job's friends might see that Job could explain away a written law, and so they appeal, as Jews used to do, to a living testimony instead. For the word *העדות*, which Isaias, viii. 20, uses to show what their practice was, is only used once elsewhere; and there it is of a living testimony of "consuetudo", Ruth, iv. 7, and so we may as well save Isaias from tautology by adopting, the same sense for the text cited from him. Hypocrites, who counterfeit the good, will then appeal to the law and to the testimony; to oral and to written teaching; to the books of Moses, and to those who sat in the seat of the elders (see Deut., xvii. 8). Imagine Hyllus or Deianira desirous of proving some truth to Hercules in his torments, and we cannot have a doubt that a cloud of tradition would not be half as effective as the decisions of the lively oracle of Delphi. If Job's friends, then, thought he raved, they would scarcely quiet him with a mere appeal to legendary lore. The *ἤπια φάρμακα* must, in such a case, be applied by some living physician, sitting, if you please, in the seat of his predecessors, and deriving from them a portion of his authority. Hence the bitter Bildad, in viii. 8, says:

"Ask now at a primitive race:
 "Fix thy heart upon searching their sires!
 "For a yesterday are we ourselves,
 "So we know not: a shadow indeed
 "Be the days we have lived upon earth!
 "Will not they give instruction to thee?
 "Not *tell* thee? and forth from their heart
 "Not cause their discourses to flow?"

So palpable is the allusion to some lively oracle here, that good Pineda cites Deut., xxxii. 7, and Psalm, lxxvii. (lxxviii.) 3, as parallels. Bildad evidently wishes to crush Job with what certain living representatives of antiquity would say to him. The words of Eliphaz are substantially to the same purport, xv. 17.

"I will show thee: oh! hearken to me!
 "'T is a thing I have seen, so would state,
 "A thing men of wisdom will *tell*,
 "Men that never did swerve from their sires,
 "When to these alone given was the land,
 "And amid them no stranger did pass".

Here, by neglecting the moods, and rendering *האריך*



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Clement, Pæd., iii. 12, p. 307. And Pineda's (in loc.) parallels are either quite beside the mark, or from authors after Christian times. But see Döllinger, Heid. und Jud. p. 785.

Objection:
Job offers sacrifices like a patriarch.

55. But we are digressing from the consideration of objections to self-defence. It is urged further, then, that if Job had been a Jew, he would not have offered sacrifice in private. It is indeed painful to part with this pleasing picture of a pontificating patriarch; yet let us be allowed to endeavour to persuade the reader to hang it up as a "votiva tabula" over the altar of probable truth. Now the bright David could offer to the suspicious Saul his pious father's זבחה הימים (I. Kings, xx. 6, 29) as an excuse for absence even in quiet times. They were, therefore, things of notoriously common occurrence: why, then, should the pious Job be less a Jew than the pious Jesse, because he had a private sacrifice, and that, as we suppose, when priests were being led "barefooted each of them away"? Or if we say that in Jesse's days the ark had as yet no fixed abode, what shall we make of his son's sacrifice on the threshing floor of Areunah? Or again, if the circumstances of the times excuse Elias, why are they not to excuse Job, for offering sacrifice *extra templum*? If we give Jesse or David an unmentioned Levite, why not allow one to Job? If we make a priest of Elias without evidence, why not accept evidence of the weakest kind to prove Job a Levite too? And as of the only authors who curse their day one, Jeremias, certainly was a priest, why, when both specify in the curse, in order to augment it, that they were born *males*, refuse to find in their common priesthood a reason for that item of the curse? Priests were more likely to be hunted out and carried into captivity, and more likely when in captivity to miss their sacrifices and other privileges. That gives a *good* reason why men born at that time should regret that they were born males, and, therefore, some sort of reason why we should suppose Job was a priest as well as Jeremias. But why Jobab should put that into his curse, is not so easy to say, without mystical lore. Let us add here, that the same Septuagint which makes Job Jobab, makes Tobias (xiv. 11), 158 years old! "*Scire velim*" *patriarchatum*, "*quotus arroget annus!*" Abundant instances of longevity in later days, however, may be found in Schubert's *Geschichte der Seele*, p. 354. But such objections are really not worth considering, as neither

are the ridiculous scepticisms lavished on the speeches of Elihu.⁵

56. But it may still be said, that it is difficult to put together positive circumstances under which a Jew would have written as our author does. He who endeavours to do this, must necessarily get into the region of what "might have" been; but he need not therefore take leave of what is "likely". What we have done hitherto is this—we have put before the reader (ii.) an author writing idiomatically in the Jews' language (iii.), quoting or referring to the literature of the Jews up to the time of Isaias, mentioned by Ezechiel after Daniel, speaking of a captivity, and referring to events known to have existed at the times of the captivities, as well as evincing knowledge obtainable by a Jew about that time. The title which this gives us to consider our author a Jew (iv.), has been also improved by the removal of some objections. After this, and not before it, we have some right to invent circumstances under which a Jew would have so written.

How Job might have been a Jew.

57. Now, a nation acquainted with Ophir and Tartessus, Sinim and Sepharad, Egypt and Greece (Javan), Crete (Kittim), and Babylon, locate these places as we may, certainly looks like a commercial nation. Even in Solomon's days they had a naval station (and perhaps a "consul" there) at Ezion Geber, on the Red Sea (see Robinson's Palestine, i. p. 169). In Isaias's days, there was a multitude of strangers (xxix. 7) to be found in Jerusalem. This alone might beget a suspicion that there were a multitude of Jews settled abroad. A trip down the Red Sea was easy enough. Rab-shake, who spoke Hebrew and has a Hebrew name, might be a degenerate Jew, who traded in wine, settled at Babylon, and who had risen by his talents to office there. It is scarcely credible that he should be the only Jew about Sennacherib's capital. *Devout* Jews could not well get settled in every nation under Heaven, unless the deeply-seated commercial propensities of the Jewish people had gradually, and that in spite of the law, centuries before, also carried *indeavour* ones thither. Commerce usually precedes devotion upon their respective travels. Whatever else Isaias, xliii. 6, may mean, it certainly seems to contemplate the existence of Jews settled with their families in all parts of the world:

The Jews a commercial nation.

⁵ Mr. Renan's Job came to us too late to use; but Welte had refuted the staple of his objections to Elihu (in Herbst's Einleitung, 1., p. 201) long ago.

“Fear not, for I myself am with thee,
 “From East will I thine *offspring* bring;
 “From West too will I gather thee;
 “Will say unto the North, ‘Give up’,
 “And unto South, ‘Hold not thou back’.
 “My *children* bring thou from afar,
 “My *daughters* from the ends of the earth”.

And if there is, at all events, some appearance of such being the case in regard to distant nations, much more is it likely in regard to all the neighbouring nations. For, when the prophets are ordered, as most of them are, to prophesy against those nations, either such prophecies must have been a mere *brutum fulmen* at the time, or there must have been some mode of publishing them amongst those nations. In this way perhaps Tyre knew who Daniel was (see Ezech., xxviii. 3). And what more likely mode could we invent, than that which the supposition that there were Jewish settlers in almost all of them, supplies? Their own interests, with such settlers, would be directly affected by the threatened downfall of these nations; indirectly, announcements of this nature might benefit even the natives. Jonah’s mission to Nineveh at a distance, can hardly have been without some kind of counterpart in the neighbouring countries. Where indevout Jews went first for commerce, there devout ones would in time follow: as the indevout exchanged at the caravan “a hide for a hide” (ch. ii. 4), so the devout, at the passover, might learn of prophecies and presentiments to transport to their distant settlements.

58. Without the smallest desire, then, of carrying Job to Tartessus to see the Spanish mines, it surely is not absurd to suppose that he might have been a metic settled within reach of the Holy Land. The Arabs show Job’s well near Jerusalem to this day.—Robinson, Pal. i., p. 239, 273. They are welcome, if they can, to confirm this legend by what has been here offered. But, in xl. 23, the Jordan is mentioned, and one does not see what, but a preconceived theory, should induce one to put on a good Hebrew word, used in a good Hebrew author, a sense which it cannot, perhaps, be proved to have in any passage whatsoever; and that too when the common sense will do. In such a residence as this view would make Job’s to have been, the Jews or proselytes about him are much more likely to have been indevout than devout Jews; but as they held to the Jewish creed, of course Job would keep on good terms with them, and

Job’s
 friends
 may
 have
 been
 commer-
 cial men,



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manner been here assumed, that the question before us is a critical question. If our readers do not admit that, then of course we have no business to ask them to weigh our premisses, and not our conclusion; for they have got a conclusion from some other source. But those who do admit it to be a critical question, may disprove these premisses, or find others to confirm the same conclusion. *Μᾶλλον γὰρ ἐκ πλειόνων ἔτι πεισθείη τις πεπεισμένος· πρὸς δὲ τὸ πεισθῆναι μὴ πεπεισμένος, οὐθὲν μᾶλλον.* Aristot. *Meta*, p. 1086, a. 19 (supply *ἂν ἦκοι* or something of the sort).

60. This little disquisition, then, must here come to a close, after passing through a variety of confessedly debateable minutiae. But as the author does not forget that the details of such circumstantial evidence (so to call it) necessarily are debateable, so the reader ought not to forget that a great number of uncertain premisses may yet generate a certain, a morally certain, conclusion. So far as this conclusion is adverse to ascribing to our author an immense antiquity, it is confirmed by critics of all classes abroad, whether they be Catholics or infidels, Protestant or nondescript. It is not, therefore, through any particular religious bias that men have given up the antiquity of the book. This is worth mentioning as helping to show that the question *is* a critical question. From it we have endeavoured, as the readers of the *ATLANTIS* will expect, to exclude theology: we have both professed at first, and endeavoured throughout, to make the question a critical question. But should any one not a reader of the *ATLANTIS*, accidentally take up what has been here written, him would we address as one, who, for the time being, had become one of its readers, and must abide by its laws, in the words of the learned St. Jerome (in *Isaias*, xiv.): “*Quod hæreo literæ et in more serpentis terram comedo, tuæ est voluntatis, qui historicam tantum interpretationem audire voluisti.*”

The nature of the premisses and of the conclusions not to be forgotten.

SCIENTIFIC RESEARCHES.

ART. I.—*On the use of the Sections of the Cone in the solution of certain Geometrical Problems.* By REV. W. G. PENNY, M.A.

THE object of the following paper is to show that there is a large class of problems, which, though they do not admit of solution by rule and compasses only, nevertheless admit of a very simple geometrical construction by means of a circle and a curve traced on the paper from any parabolic section of a cone whatever; and that a single such section will suffice for the entire class of problems of this kind.

Every problem in plane geometry may be said to have for its object the determination of some one or more *Points*. Thus in the first proposition of Euclid, which is a good type of all geometrical problems, the object is to determine some Point from which, if straight lines be drawn to the extremities of a given line, an equilateral triangle shall be formed. Or, to take an example of another kind;—To determine the area of a given curve. This again is only the same thing as the determination of a Point, viz., that at which some straight line must terminate, so that the square or other figure described upon it may equal the area of the curve.

Now in order to determine the position of a point in a plane, it is well known that *two* conditions are necessary; we must have *two* facts concerning it given us, such as its distances from two given lines, or from two given points, or the like. Suppose the point to be referred to rectangular axes (and the same reasoning will apply to all other cases), we must have two coördinates, x' and y' , in order to define its position; and as we have two coördinates, so must we have two equations to determine their magnitude. And as these equations are themselves determined by the conditions of the problem, we may call them “Equations of Condition”.

These equations may be of any degree, and they may each of them contain both the coördinates or only one, as the case may be.

The first thing then is, of course, to form our equations of condition; let us suppose them to be of the second degree, and let them be

$$\left. \begin{aligned} Ax'^2 + Bx'y' + Cy'^2 + Dx' + Ey' + F = 0 \\ A_1x'^2 + B_1x'y' + C_1y'^2 + D_1x' + E_1y' + F_1 = 0 \end{aligned} \right\} \text{A}$$

These, then, are the equations which express the relation which the coördinates of the point have to each other and to certain known quantities expressed by A, B and C; and from them the values of x' and y' are to be found. It often happens, however, that the values which satisfy these equations are such that they cannot be constructed geometrically by rule and compasses alone. This generally happens when the equation which we arrive at by the elimination of x' or y' is a cubic. In this case, straight lines and circles will not suffice for the construction of the roots, and we must have recourse to a simple method which it is the object of this paper to point out.

Now it is evident that, besides satisfying these two equations, the coördinates $x' y'$ will also satisfy the two equations

$$\left. \begin{aligned} Ax^2 + Bxy + Cx^2 + Dx + Ey + F = 0 \\ A_1x^2 + B_1xy + C_1x^2 + D_1x + E_1y + F_1 = 0 \end{aligned} \right\} \text{(B)}$$

which are the equations to two lines, x and y being now no longer restricted to the required point, but representing the variable or current coördinates, and belonging to any point in the line whatever.

And since the coördinates of the point required satisfy the equations of each of these lines, it must lie in each of them, and will in fact be the point where they intersect. The position of the point then will here, as indeed it is in all cases, be determined by the intersection of two lines.

What we have to do then is, first, to form two equations, such as (A), then write the same with the accents suppressed, as equations (B), and consider these as the equations to two lines, and then, if possible, draw the curves represented by equations B, and the point where they intersect will be the point required.

But where it is not possible to draw the lines (B), the thing to be done is to try to replace them by others which shall intersect in the same points, and which we have the means of drawing. Suppose for instance that we have a parabolic section of a cone; we may easily place it upon the paper, and draw a parabola from it. If then we can replace the two equations by two



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Prop. 1. Every cubic or biquadratic equation may have its roots exhibited geometrically by the intersection of a circle and a given parabola.

1. Let the equation be a cubic; and let it be, when wanting its second term,

$$x^3 + qx + r = 0.$$

The real roots of this may be found by means of a circle and a parabola, both of them passing through the origin. Let their equations be

$$x^2 - 2ax + y^2 - 2\beta y = 0. \quad (1)$$

$$y = \frac{x^2}{k} \quad (2)$$

where a , β and k are quantities as yet unknown. By the elimination of y , we obtain the equation

$$x^4 + (k^2 - 2\beta k)x^2 - 2ak^2x = 0, \text{ or dividing by } x,$$

$$x^3 + (k^2 - 2\beta k)x - 2ak^2 = 0. \quad (3)$$

This will coincide with the proposed equation, if

$$k^2 - 2\beta k = q \quad 2a = -\frac{r}{k^2}.$$

Now since we have three undetermined quantities, viz., a , β , and k , and only two equations to determine them, one of them may be taken arbitrarily, and of any magnitude we please. Let this one be k , which we may therefore take equal to the latus rectum of the parabolic section of a cone which we may possess. Then

we shall have $2a = -\frac{r}{k^2}$, $2\beta = \frac{k^2 - q}{k}$; so that equation (1) becomes

$$x^2 + \frac{r}{k^2}x + y^2 + \frac{q - k^2}{k}y = 0, \quad (4)$$

between which, and equation (2), if we eliminate y , we arrive at an equation identical with the proposed, and whose roots are therefore the same, and represent abscissæ of the points required.

Equations (2) and (4) intersect at the origin; they will also, if the branches of the parabola are long enough, intersect again in some one point at least, which is the point which determines the roots of the equation. But if the constant quantities in the proposed equation are large, so that the parabola will not meet

the circle, let us diminish the roots of the equation in a given ratio, and we shall always be able to diminish them so that the intersection may take place as near to the origin as we please, so that however small a portion of the curve we have, it may always be made to suffice; for,

The equation with its roots thus reduced becomes

$$x^3 + qm^2x + m^3r = 0, \quad \text{and } \alpha \text{ and } \beta \text{ become}$$

$$\alpha = -\frac{m^3r}{2k} \quad \beta = \frac{k}{2} - \frac{m^2q}{2k}.$$

Now when m is taken very small, α becomes very small, and β becomes very nearly equal to $\frac{k}{2}$. Hence it is manifest that a

circle described with these quantities for the coördinates of its centre and passing through the origin, will intersect the parabola very near the origin, as near in fact as we wish to make it. Therefore the roots of the reduced equation may be represented by means of a given parabola, however short its branches; and thence we may obtain the roots of the original one, by multiplying by m . Problem (1), which relates to the duplication of a cube, is an instance. If the line whose cube is to be duplicated were very large, we should only have to reduce the roots of the first equation in the problem; or in other

words, take a line $\frac{1}{m}$ th of the given one; find thence the lines whose cube is the double of it, and multiply the latter line by m . We can always, therefore, find at least one of the real roots by this method; and if there are three, the other two may be found by rule and compasses. Let $a b c$ be the roots of the equation $x^3 + qx + r = 0$; then, since the equation wants its second term, $a + b + c = 0$, also $r = -abc$.

Suppose that a is the root which we have found; then the quadratic, which has for its roots the other two, will be

$$x^2 - (b + c)x + bc = 0,$$

or $x^2 + ax - \frac{r}{a} = 0$, since $b + c = -a$, and $bc = -\frac{r}{a}$,

an equation whose roots may be determined by rule and compasses. Very often, however, it will not be necessary to do this; it is only when the parabola is long enough to cut the circle only once. We may, of course, depress a biquadratic in like manner.

If we have a cubic in which the second term is present, we

may either deprive it of its second term, or we may leave it as it is, and use a parabola passing through the origin, but having its vertex elsewhere, as is done in problem (4), in which case we

should assume for the equation to the parabola, $y = \frac{x^2 + hx}{k}$,

where h is to be determined in the same way that the other constants are.

It appears, therefore, that any cubic equation whatever may have its real roots constructed geometrically by a circle and a given parabola; and hence that any problem which gives rise to a cubic equation may always be solved by this method.

2. Let the equation be a biquadratic, and let it be, when deprived of its second term,

$$x^4 + qx^2 + rx + s = 0.$$

This may be solved by a circle and parabola, the latter passing through the origin, but not the former. Let their equations be

$$x^2 - 2ax + y^2 - 2\beta y + c^2 = 0$$

$$y = \frac{k^2}{k}.$$

Then by the elimination of y we obtain the equation

$$x^4 + (k^2 - 2\beta k)x^2 - 2ak^2x + c^2k^2 = 0,$$

which coincides with the proposed equation if

$$k^2 - 2\beta k = q, \quad 2ak^2 = -r, \quad c^2k^2 = s,$$

which give $\beta = \frac{k^2 - q}{2k}$ $a = -\frac{r}{2k^2}$ $c^2 = \frac{s}{k^2}$,

so that equation becomes

$$x^2 + \frac{r}{k^2}x + y^2 - \frac{k^2 - q}{k}y + \frac{s}{k^2} = 0,$$

which, it is easily seen, represents a circle, the coördinates of

whose centre are $-\frac{r}{2k^2}$ and $\frac{k^2 - q}{2k}$, and whose radius

$$\text{is } \sqrt{\frac{r^2}{4k^4} + \frac{(k^2 - q)^2}{4k^2} - \frac{s}{k^2}}.$$

This radius will always be possible if the quantity under the ra-



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Add together the equations

$$x'^2 + \frac{2r}{k^2}x' + y'^2 + \frac{q-k^2}{k}y' = 0, \text{ and}$$

$$x'^2 - ky' = 0, \text{ and we have}$$

$$2x'^2 + y'^2 + \frac{2r}{k^2}x' + \left(\frac{q}{k} - 2k\right)y' = 0, \quad (1)$$

which, with the accents suppressed, and $x y$ being taken for variable coördinates, represents an ellipse.

Since k is arbitrary, we may make it anything we please, and may therefore make it equal to any of the constant quantities in the cubic equation, which will make equation (1) the simplest. The same applies to biquadratic equations.

We might also in the same way obtain the equation to an equilateral hyperbola, the use of which might be sometimes convenient.

It appears, therefore, that any problem whatever, which can be solved by the intersection of conic sections, or which gives rise to an equation of the third or fourth degree, may be solved by means of a circle and a given parabola, or if we prefer it, by a circle and an ellipse or hyperbola.

These methods appear to give the simplest construction which problems admit of, when they are not capable of being solved by rule and compasses.

The use of the parabola is in general preferable to the ellipse, as it requires some skill to describe the latter with perfect accuracy.

It is of course necessary that we should know the latus rectum of the parabola which we are using. It may easily be found thus: Place the section of the cone on the paper, and trace the curve from it; draw any two parallel chords; bisect them, and through the points of bisection draw a straight line, which will therefore be a diameter. Through any point in it draw the line PQ at right lines to it, meeting the curve in P and Q . Bisect PQ in M , draw $MA \perp PQ$, and meeting the curve in A ; then MA is the axis, and A the vertex of the figure, so that if k be the lat. rect. we shall have $MP^2 = k \cdot MA$. Find, therefore a third proportional to MA and MP , MP being the mean; and it will be the latus rectum required.

In this way the latus rectum of the parabola, used in the following problems, was determined.

It has been long known that certain problems can be solved by the intersection of conic sections, but they have never been re-

cognized as geometrical problems, possibly from its being supposed that they require a particular conic section for each problem, in which case they might be truly regarded as impossible, but this it appears is not the case; it is not necessary that we should be able to describe any conic section with any axes, in the same way that it is that we should be able to describe a circle with any radius; a single curve will do for all problems; it is only necessary that we should be able to describe some one parabola, which may easily be done by a section of a cone. This, then, is the only additional instrument or postulate required. And it is to be observed that not less than this seems requisite for ordinary propositions in conic sections, where it is necessary that we should be able to describe, not *any* conic section, but some *one*, which will serve as a specimen of all the rest. Such, at least, would be required according to the strict method of the ancient geometers, who always suppose that we have the means of constructing the figure which we have to reason upon; otherwise a much shorter way might be given of proving Euc., b. i., *prop.* 5. And the only reason why this shorter way has not been generally received, is the fact that it requires the construction of a figure which the student has not yet been taught to construct. If either of the equations of condition is of a higher order than the second, and is such that it cannot be replaced by one of lower degree, we shall require a curve of a still higher order than a conic section for the solution of the problem, so that we have in geometry several distinct classes of problems. Indeed geometrical problems might be classified according to the instruments which are required for their construction. First, there are those which only require rule and compasses; next, those which require a parabola, or a parabolic ruler; and lastly, those which require still higher curves. And these latter may in general be regarded as impossible; and moreover they appear to be distinguished from those of the second class by another feature besides requiring a higher order of curve; for whereas a single parabola will suffice for all problems of the second class, in the third class a separate curve or instrument appears to be necessary for each problem; for, the equation for determining x would here be of the fifth or sixth degree at least; and though we might find plenty of curves of the third order, which, by elimination with the equation to a circle, would produce an equation coinciding with the general equation of the sixth degree, yet we require for the purpose a curve of more than one parameter, otherwise the equation so formed will only coincide with an equation of the sixth degree for particular values of the constants.

By a curve containing only one parameter, I mean one whose

equation is such that, by transformation of coördinates, it may be reduced to one containing only one constant.

Before giving examples of the solution of problems by these methods, it may be well to say a few words as to the circumstances under which problems may be solved by rule and compasses only.

As a general rule, then, when there are not more than two points which satisfy the conditions of the problem, it may be always solved by rule and compasses; but when there are *three* or more, it cannot in general; because two circles cannot intersect in more points than two. In problem 3 for instance, no circle can intersect the circle there drawn in as many points as the parabola does. In certain cases, however, we might replace the parabola by *two* circles, since two circles may intersect either a straight line or another circle in four points. This may be done when the cubic or biquadratic equation contains what may be called common or unconnected roots—roots, that is, which might have belonged to a simple or quadratic equation, such as $a, b \pm \sqrt{c}$; but not when it contains proper or connected roots, that is, those which could not have belonged to a lower equation than a cubic, such as $\sqrt[3]{2a}$, which is a root of the equation $x^3 - 2a^3 = 0$. In this latter case, the roots are all necessarily connected together; in fact, knowing that one root is $\sqrt[3]{2a}$, we know what the other two roots must be, even without having given the equation which they belong to. But if, on the other hand, we knew that one root of an equation was a , we could not tell without seeing the equation itself, what the others were, or even what sort of equation it belonged to. In this latter case, it is the same thing virtually as if we had, not one but *two* problems to solve.

Hence, if we have found a circle and parabola, whose intersection will determine the roots of the equation $x^3 + qx + r = 0$, and if we find by solving the equation that the roots are unconnected, we might replace the parabola by two unconnected lines; but if the roots are connected roots, we can only represent them by some line which actually connects them, or passes through them all, as in problem 3.

In other words, when the cubic, etc., is resolvable into factors, in which the cubic sign does not appear, the parabola may be replaced by simpler lines, but not otherwise.

Again, when the equations of condition represent or can be reduced to two conic sections, whose diameters are in the same line, or whose centres coincide, the problem may be solved by rule and compasses, but not otherwise. In the former case they may, by transformation of coördinates, be reduced to two equations of the form $y^2 = mx^2 + nx + p$, and in the latter to two of the



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which represent a circle and parabola. Performing the elimination, after dividing by x , which multiplies every term, we have,

$$x^3 + (k^2 - 2\beta k)x - 2ak^2 = 0,$$

which will coincide with the proposed equation (1) if

$$k - 2\beta = 0 \text{ and } 2ak^2 = 2a^3, \text{ or}$$

$$\text{if } \beta = \frac{k}{2} \text{ and } a = \frac{a^3}{k^2}.$$

The value of k is indeterminate, since whatever value we assign to it, if we substitute the value of a and β above found in the equation to the circle, and then eliminate y between this equation and that to the parabola, we shall have an equation in which k does not appear; and so we may take it of any value we please, and therefore may employ any parabolic section whatever to trace the curve with. The equation to the circle then becomes

$$x^2 - \frac{2a^3}{k^2}x + y^2 - ky = 0,$$

which represents a circle passing through the origin, and having for the coördinates of its centre $\frac{a^3}{k^2}$ and $\frac{k}{2}$. Take therefore $OC = \frac{a^3}{k^2}$ (Euc. vi., prop. 11, 12) and $CD = \frac{k}{2}$; join OD , and with centre D and distance DO describe a circle. Also place the parabolic section so that its axis shall coincide with that of y and its vertex shall be at the origin, and then trace the curve, which will intersect the circle in P . Then, if from P an ordinate PM be drawn, the cube of the line OM will be double that of a , since by the elimination of y between the equations (2) and (3) we arrive at the equation

$$OM^3 = x^3 = 2a^3.$$

The line AB has here been taken small; but if it had been taken much larger, it would require that the branches of the parabola should be produced to a considerable extent in order that they might meet the circle, whereas we cannot actually produce them beyond the limits of the section of the cone which we have; but we might still, nevertheless, easily find the cube required by first taking a smaller line, as in the figure, and so by finding any two lines, the cube of one of which is double of the cube of the other, we may by proportion easily find the cube required.

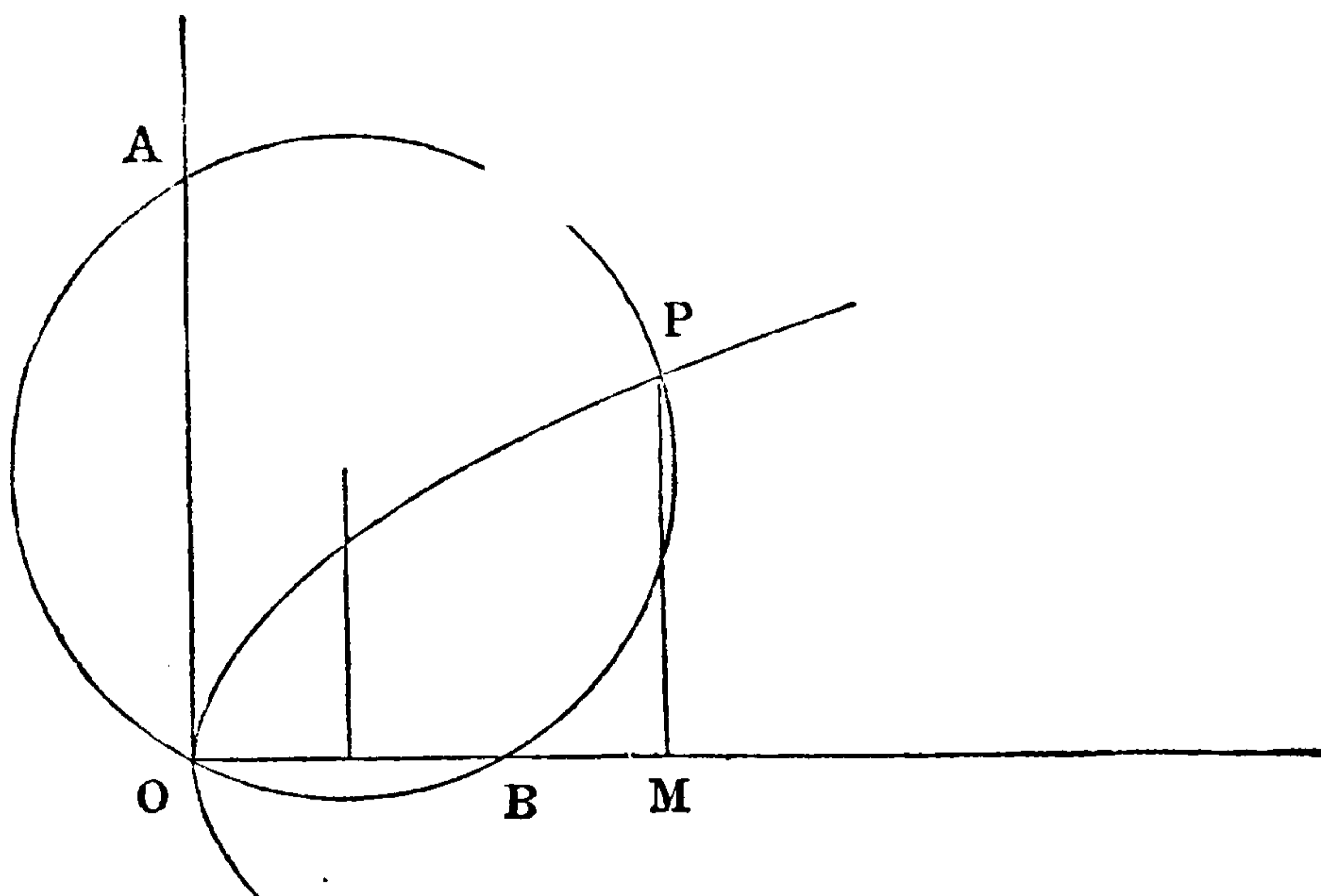
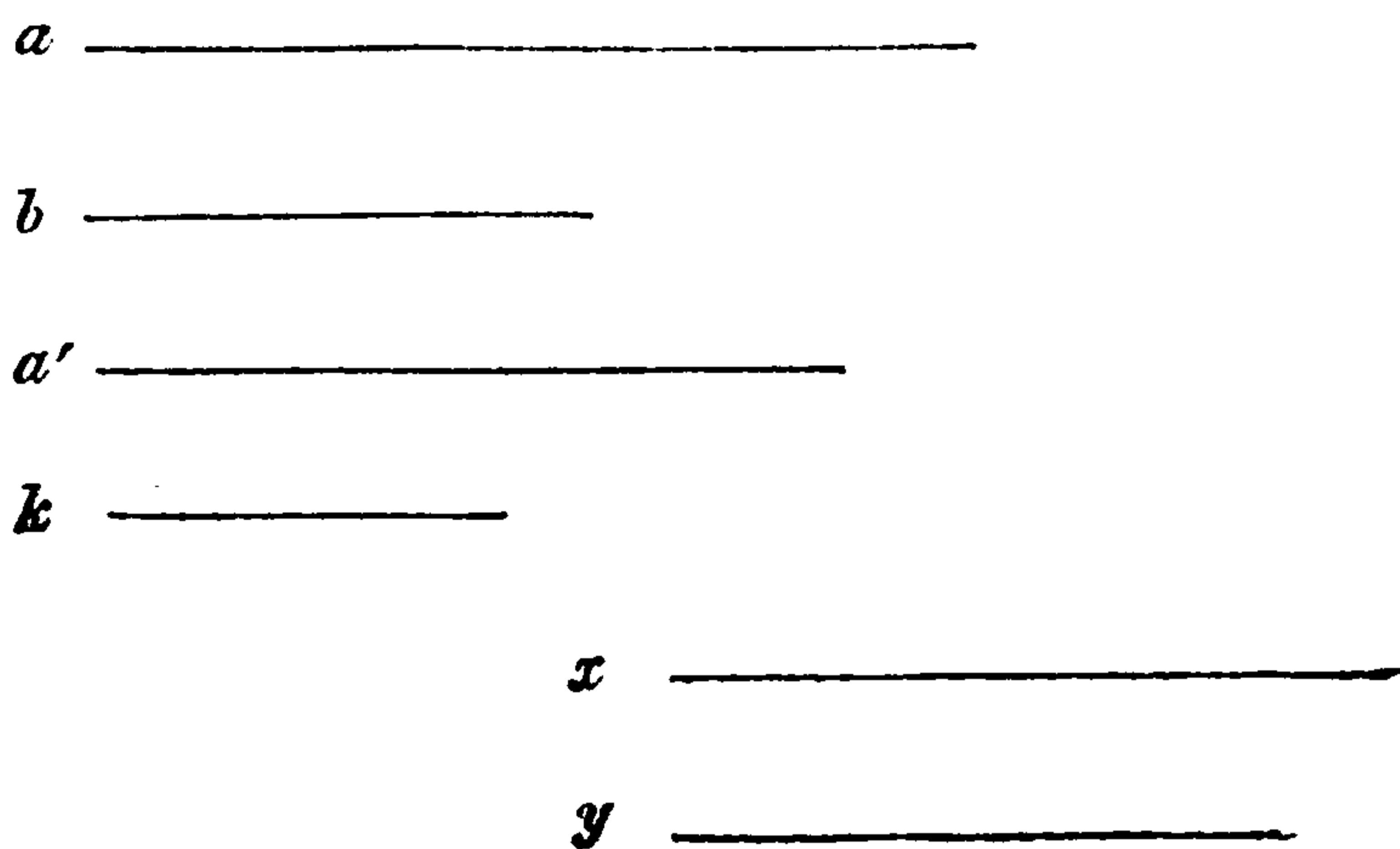
We might also have done the problem by first finding a cube

We may also obtain the equation to a hyperbola by subtracting twice equation (3) from equation 2.

Cor. We may also in like manner find a cube which shall be equal to the sum of two given cubes.

Prob. 2. To place two mean proportionals between two given straight lines.

Prob. 2, Fig. (a).



Let a, b , fig. (a) be the given lines; draw OA, OM for axes, let x' and y' be two mean proportionals between them; then we shall have $a:x'::x':y'$ and $x':y'::y':b$ or

$$x'^2 = ay' \text{ and } y'^2 = bx'$$

Now suppose that $x' y'$ are the coördinates of the point of intersection of the two curves whose equations are

$$x^2 = ay^2, (1) \quad y^2 = bx (2);$$

then by drawing these two curves, and from the point of intersection drawing the ordinate PM , we should have OM and PM for the quantities required.



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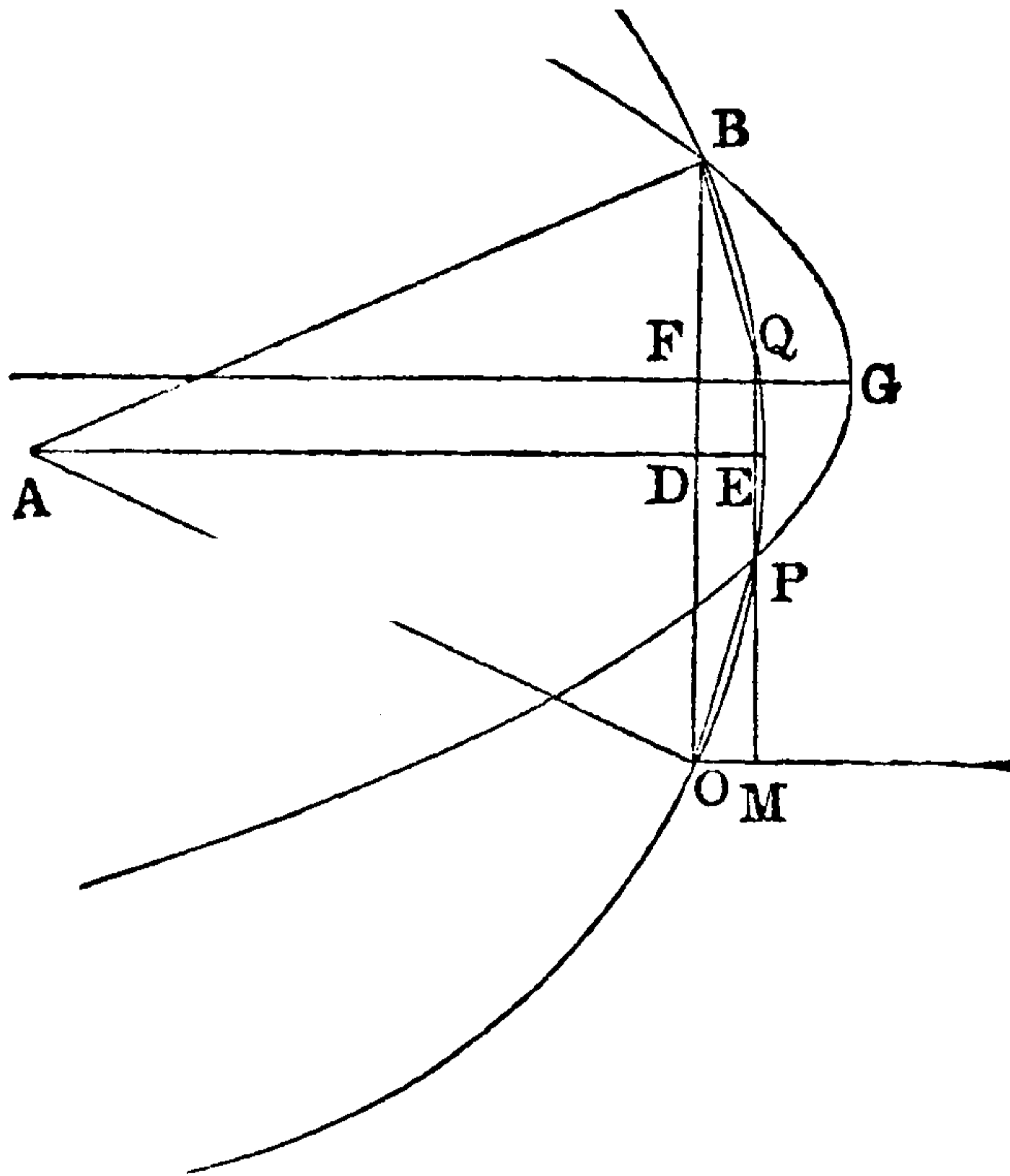
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Prob. 3, Fig. (b).



also from the equation to the circle OPQB we have

$$x^2 + y^2 = 2\beta y - 2ax, \quad (2)$$

by subtracting (2) from (1) and suppressing the accents, we have

$$4(\beta - y)^2 - 2\beta y + 2ax = 0,$$

which is the equation to a parabola, and is easily reducible to

$$\left(y - \frac{5}{4}\beta\right)^2 = \frac{a}{2} \left(\frac{9}{8} \frac{\beta^2}{a} - x\right)$$

which represents a curve situated as in the figure, and having its latus rectum $= \frac{a}{2}$, and the coördinates of its vertex $\frac{5}{4}\beta$ and $\frac{9}{8} \frac{\beta^2}{a}$.

Let therefore AD be taken equal to twice the lat. rec. of the given parabola. Describe the circle as in the figure. Take $OF = \frac{5}{4}\beta$, and FG (parallel to $AD = \frac{9}{8} \frac{BD^2}{AD}$), and draw the parabola having FG for its axis, and its vertex at G. Then the point P, where it meets the circle, is the trisection of the given angle.

To do the same by an ellipse, see fig. (c),



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Also the equation to the circle is

$$(y+a)^2 + (x-a)^2 = a^2, \quad (2)$$

so that the point P is determined by the intersection of the lemniscata with the given circle.

The lemniscata, however, may be replaced by a conic section; as follows: transfer the origin to O, for convenience sake, then equation (1) becomes

$$(y'^2 + x'^2 + 2ax' + a^2)^2 = a^2(x'^2 - y'^2 + 2ax' + a^2), \quad (3)$$

$$\text{and (2) becomes } y^2 + x^2 = -2ay. \quad (4)$$

which gives the following relation between the coördinates of P,

$$y'^2 + x'^2 = -2ay'.$$

Substitute this value of $x'^2 + y'^2$ in equation (3), and it becomes after reduction and suppressing the accents,

$$3x^2 - 8xy + 5y^2 + 2ax - 4ay = 0, \quad (5)$$

which it is easily seen represents an ellipse, which curve may therefore be used instead of the lemniscata.

We may also use a parabola instead of the ellipse. To find its equation we must multiply equation 4 by some quantity m , and add it to (5), which gives

$$(3+m)x^2 - 8xy + (5+m)y^2 + 2ax + (2am - 4a)y = 0.$$

Now in order that this may represent a parabola we must have $64 - 4(3+m)(5+m) = 0$, which gives $m = \sqrt{17} - 4$, so that the equation just given becomes

$$(\sqrt{17}-1)x^2 - 8xy + (\sqrt{17}+1)y^2 + 2ax + 2(\sqrt{17}-6)ay = 0,$$

The parabola, however, represented by this has a very small latus rectum compared with the radius of the circle; so that to employ the same parabola which has been used in the previous problems, it would require that the radius of the circle should be very large, and the branches of the parabola very long, in order that they may meet it; so that this method will be here inapplicable, and it will be necessary to have recourse to the second general method proposed in the beginning of the paper. We must, therefore, eliminate x or y (x will be more convenient), between equations (4) and (5), which will give after reduction

$$y^3 + \frac{14}{17}ay^2 + \frac{10}{17}a^2y + \frac{2}{17}a^3 = 0, \quad (6)$$

and we have now to find another circle and parabola such, that the elimination of x between their equations will produce equa-

tion (6), or since the lat. rect. of the parabola is supposed given, we have only to determine its position and the magnitude and position of the required circle. Let therefore the equation to the circle parabola be

$$x^2 - 2ax + y^2 - 2\beta y = 0$$

$y^2 + hy = kx$. Where a, β, h are to be determined. Eliminating x between them, we have

$$y^3 + 2hy^2 + (h^2 + k^2 - 2ak)y - 2k(\beta k + ah) = 0,$$

which agrees with the equation (6) if

$$2h = \frac{14}{17}a, \quad h^2 + k^2 - 2ak = \frac{10}{17}a^2, \quad 2k(\beta k + ah) = -\frac{2}{17}a^3,$$

which give for the values of h a β

$$h = \frac{7}{17}a, \quad a = \frac{k}{2} - \left(\frac{11}{17}a\right)^2 \frac{1}{2k}, \quad \beta = -\frac{a}{2} \left(\frac{7}{17} + \frac{1}{17} \frac{a^2}{k^2} - \frac{7}{17} \left(\frac{11}{17}\right)^2 \frac{a^2}{k^2} \right);$$

also since the equation to the parabola may be put under the

form $\left(y + \frac{h}{2}\right)^2 = k\left(x + \frac{h^2}{4k}\right)$ it is manifest that the coördinates of its

vertex are $-\frac{h}{2}$ and $-\frac{h^2}{4k}$.

Draw therefore a line parallel to BO and at a distance $-\frac{h}{2}$ from it, which will be the axis of the parabola, and take a point in it distant from OC by the quantity $-\frac{h^2}{4k}$, and draw the required parabola having this point for its vertex, and draw the circle passing through the origin, and having a and β as determined above for its centre. Then from the point E where they intersect, draw EPN parallel to BO, meeting the circle in P. P will be the point required.

If the radius a were so large that the parabola and circle would not intersect, we have only to take a radius of a suitable size as in the figure, and having by it obtained the proportions of the three lines, obtain by proportion the actual magnitude of those required for any particular radius.

The quantity β is somewhat complicated: the easiest way of determining it is first to find the value of a and draw the line, and then determine that of β from the equation

$$\beta = -\frac{h}{k}a - \frac{1}{17} \frac{a^2}{k^2}a.$$

If we wish to make use of an ellipse, let us add together the equations to the circle and parabola, and we have

$$x^2 - (2a + k)x + 2y^2 - 2(\beta - h)y = 0$$

$$\text{or } \left(x - \left(a + \frac{k}{2}\right)\right)^2 + 2\left(y - \frac{\beta - h}{2}\right)^2 = \left(a + \frac{k}{2}\right)^2 + \left(\frac{\beta - h}{2}\right)^2$$

which, the quantities $a \beta h$ being determined, will be preferable to using that given in the first part of the problem.

The following problems are some among many others which appear to belong to this class. Others will occasionally be given in future numbers.

Prob. 5. ABC is a right angled triangle having C its right angle, required to draw a line from A dividing the base BC in P, so that the rectangle AP, PC = rectangle AC, BP.

Prob. 6. To divide the hypotenuse into two segments by a line drawn from the opposite angle, so that one of the segments shall be a mean proportional between the line so drawn and the other segment.

Prob. 7. To divide a straight line into two parts, such that their sum is to their difference as the square of the one part is to the square of the other.

Prob. 8. A chord is drawn in a circle, and from its middle point and its two extremities, lines are drawn to a point P in the circumference; it is required to draw them so that the solid contained by them shall be equal to the cube of the radius.

Prob. 9. Two circles touch each other internally at A, and through A, AB the diameter of the larger circle is drawn, it is required to place a chord PQR in outer circle and touching the inner circle in Q, so that the chord shall be equal to the distance QB.

Prob. 10. In the same two circles a line APQ is required to be drawn, cutting the circles in P and Q, so that if PR be drawn \perp to it, and cut the outer circle in R, PR shall be equal to AQ.

Prob. 12. Given the greatest side and the opposite \sphericalangle of a Δ , to construct it so that the sides shall be in geometrical progression.

Prob. 13. To construct a right angled Δ , having its sides in harmonical progression.

Prob. 14. Given the base, the sum of the sides, and the distance of the vertex from a fixed point, to construct the triangle.

Prob. 15. To inscribe a quadrilateral figure in a circle such that the solid contained by three of its sides shall be double the cube of the fourth side.



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ment which has made it almost a science in itself. Thus we are enabled to see the connection between the internal structure of the earth, and the statical condition of its surface, as exhibited in the arrangement of the seas and oceans by which it is partly covered, and by the law of variation of gravity from the equator to the pole. The influence of this structure upon the phenomena of the earth's rotation, and even on the movements of our satellite, were all rendered manifest by applications of the same analysis which had already unfolded the laws of attraction of the entire spheroidal mass of our planet. All of these results point in the same general direction; they all lead to the conclusion that the earth is denser towards the centre than towards the surface, and that its materials are arranged in spheroidal strata nearly parallel to the outer crust. Laplace even showed how such phenomena could be fully explained, if the earth had originally consisted of a mass of fluid matter, capable of undergoing compression like all known fluids. The law of density of the spheroidal strata, which he has thus deduced, although necessarily hypothetical, serves to account so well for the observed conditions of the earth's figure and variation of gravity over its surface, as to lead to its provisional adoption by most subsequent inquirers. Mr. Hopkins was the first mathematician who treated the question of the rotation of the earth, taking into account the possible existence of a great part of its interior as a mass of fluid. The only physical step which he has made beyond Laplace is in separating the rigid and solid shell from the fluctuating and mobile nucleus of fluid. He assumes the same law of density for solid and fluid—namely, that of Laplace. He also assumes the same ellipticity for the interior strata of equal density of the shell and nucleus, as if the entire mass were reduced to its original fluid condition. Finally, he assumes the absence of friction and pressure between the interior fluid and its exterior solid envelope.

Mr. Hopkins, as well as Laplace, and every preceding inquirer, had either openly or tacitly assumed that in the passage from fluidity to solidity, the particles composing the earth's solid crust retained the same positions as when the whole had been fluid. To me it appeared more safe to adopt a supposition regarding the change of volume of the fluid on passing into the solid state, which would be in accordance with what we know from experiments on fused rocks. I was thus led to conclude that the laws of density of the shell and nucleus could not be perfectly similar, and also that the ellipticity of the interior strata of the earth, instead of being the same as in the original state of entire fluidity, underwent a slight increase with the progressive solidification of the mass. On this point I hope, before long, to

be able to present a new and rigorous demonstration. In the meantime, I am happy to perceive that, subsequent to the publication of my memoirs in the *Philosophical Transactions*, M. Plana has been led to a similar conclusion, without appearing to have been aware of my results.² While I conclude that the ellipticity of the inner surface of the shell cannot be less than the ellipticity of its outer surface, Mr. Plana says that they will be equal. The difference between my result and that of the eminent Sardinian mathematician appears to arise from the fact that he did not take into account the influence of change of density in the matter from which the shell was formed in its transition from the fluid to the solid state. By similarly neglecting this change I had already arrived at the same result as M. Plana.³ I have already shown how these results render Mr. Hopkins' formulæ completely nugatory for the determination of the thickness of the earth's crust.⁴ At the same time, their combination leads to some interesting conclusions relative to the structure of our planet, which are presented in the paper just quoted.

While I am very far from considering the numbers which I have given for the possible thickness of the earth's crust as strictly correct, I am surprised to find such a mathematician as Archdeacon Pratt regarding the results of Mr. Hopkins as more sure. He objects to my views relative to the difference of contraction of the solid shell and the included fluid nucleus, and thus appears to acquiesce in the old assumption that the matter of the earth undergoes no change of volume by changing its molecular condition.

Professor Haughton has objected both to the results of Mr. Hopkins and to my conclusions, on the ground that researches into the internal condition of the earth are absolutely beyond our powers of inquiry. This I fully admit, if the problem were purely one of mathematical mechanics, and if we are not allowed to make any use in the discussion, of the physical properties of such portions of the solidified crust as come under our notice. In this case Professor Stokes's⁵ modification of Clairaut's theorem, as well as Mr. Haughton's equations, fully establish the possibility of an extremely thin crust, but not of the earth's entire solidity. If the surface of the solidified shell were rigorously perpendicular to gravity, a thin crust should be admitted. What is commonly designated as the earth's surface in an astronomical and mathematical sense, is not its surface in the geological sense that we are here discussing. The former is identical with the surface

² *Astronomische Nachrichten*, No. 860, vol. 36, p. 315.

³ *Phil. Trans.* 1851, p. 527.

⁴ *Atlantis*, vol. i., p. 182.

⁵ *Cambridge Mathematical Journal*, May, 1849.

of the ocean, the latter with the surface of the solidified crust when stripped of its liquid and sedimentary coatings. As we are justified from observation in regarding this surface as sensibly different from the former, I have been already led to conclude that the thickness of the earth's crust cannot be such an evanescent quantity as Mr. Haughton's results and Professor Stokes' theorem would at first sight seem to render possible.

Archdeacon Pratt has attempted to prove that the earth's crust must be very thick, from considerations that appear as inadmissible as those of Mr. Hopkins. He investigates the equilibrium of a meridional section of the continent of India which stretches through an arc of about 24° , as if it were perfectly flat, instead of being what it really is, an arch of very sensible curvature. He assumes that the great plateau of central India, and the Himalayan mountains are elevations superimposed upon the crust, and that its under surface is perfectly uniform. The first of these assumptions makes the crust far weaker and more easily disturbed than it could possibly be with its actual shape; the second provides inequalities both of resistance and stress. I am therefore not surprised at the results of a problem in which the assumed conditions are such as to require enormous thickness of the resisting mass in order to sustain itself under the greatest mechanical disadvantages. But of these conditions, one is completely erroneous, and the other highly improbable; and I am therefore compelled to regard the problem investigated by Archdeacon Pratt as one which has no practical connection with the actual structure of the earth.



ART. III.—*Climatology of Lisbon in Relation to the Yellow Fever Epidemic of 1857.* By ROBERT D. LYONS, M.D.

IN November, 1857, I undertook a voluntary mission to investigate the epidemic of yellow fever, then raging with great violence in Lisbon. Though my investigations had no official character, the most ample facilities were afforded to me for prosecuting my inquiries by all persons in authority in Portugal, including the enlightened head of the state, His Most Faithful Majesty, Dom Pedro V. From His Excellency, the Count de Sobral, Civil Governor of Lisbon, I also received most important assistance, while I am in a most especial manner indebted to the medical faculty of that city, and, amongst several persons of note, to my valued friend and fellow-countryman, the Very Rev. Dr. Russell, President of the Irish College of Corpo Santo.



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vations, made since 1816, it would appear that, at Lisbon, the year should be divided as follows:—the months of December, January, February, and March, form the winter; the spring only lasts during the months of April and May; the true summer continues during those of June, July, August, and September; and autumn only includes the months of October and November.

Snow is very rare, particularly in the southern provinces. It falls, however, oftener than has been supposed by some writers. Within the last sixty years it has fallen at Lisbon, in 1806, 1811, 1814, 1815, according to M. de Lindenberg: in the low parts of Algarve this phenomenon is almost unknown. Every year a considerable quantity of snow falls in the mountains, where, except on the highest summits, it only lasts a month, in the provinces south of the Douro. In the two coldest regions, Minho and *Tras os Montes*, a considerable quantity of snow falls every year, and it freezes often; yet the rivers and streams are very rarely frozen over. The winters of 1799, 1805, and 1820, were extraordinarily cold. The remarkable continuance of snow in the *Serra d'Estrella* killed all the fruit trees in 1805. In the early days of February, 1820, at *Covilhã*, the wine was found frozen in the pipes of 80 almudes. Balbi says he has seen the streets of Lisbon, particularly that which leads to *Boa-Vista*, covered with ice, some pieces of which were seven lines in thickness. With the exception of *Gaviarra*, no mountain in the confines of Portugal, says the same author, retains the snow constantly during the year, not even the highest summits of the *Estrella* and the loftiest mountains of *Minho* and *Tras os Montes*. It is only on the summit of *Gaviarra*, and in some cavities of the highest mountains of the *Estrella* and the *Marão*, and on the most elevated summits of the *Serra de Senabria*, in *Gallicia*, that there is found snow which never melts. M. Joào Francesco Guimaraens has assured us, says Balbi, that he has always seen the summit of *Gaviarra* covered with snow, and that this is the case constantly every year. He affirms the same thing of the highest summit of *Marão*, but only in the cavities.

Storms are said by Balbi to be very rare in Portugal; hail still more so. It is only in autumn and winter that there is thunder, according to this observer; but the statement is not strictly correct.

It has long been known that the southern parts of Portugal, particularly Lisbon and its environs, are very subject to earthquakes. They usually take place only between the months of October and April, after great dryness and stifling heat, and after the first rains. Slight shocks are frequent, and occur almost every year.

The temperature is very variable in Portugal, and above all at *Penafiel*, *Porto*, and *Lisbon*. Colonel Franzini's meteorological

T A B L E 1

														estimated at 2 $\frac{2}{10}$ braca per second.	
1791															
Dec. 27	28·8 $\frac{1}{4}$...	28·2	1791. Rainy days below average. Dense fogs occurred 46 times this year. Great gales were observed sixty times, the most remarkable being in April, October, and Nov.
Nov. 19	...	27·6	...	...	...	...	...	...	...	...	...	...	...	...
Aug. 28	...	...	...	100	...	62 $\frac{3}{4}$	...	...	29·8	108	...	} N.N.W. N.N.E. S.W.	...	...
Feb. 8	34	
" 9	...	...	...	...	"	...	...	...	...	...	...	...	...	...
1794															
Feb. 7	28·8 $\frac{1}{2}$	1794. Dense fogs observed twenty times this year. (In Jan., Feb., Aug., Nov., Dec.) Very strong gales were observed 47 times. Two days remarkably stormy, viz., 23 Nov. and 21 December.
" 8	"	...	28·4	...	...	...	...	...	...	...	...	...	...	...
Dec. 5	...	27·5	...	...	...	...	...	...	...	...	...	...	...	...
Aug.	...	...	...	93	...	61 $\frac{7}{10}$	...	...	...	...	...	...	...	...
Jan.	...	...	...	...	34	...	...	20	23	11	72	...	N. N.N.W. N.N.E.	...
1797															
Dec. 27	28·10	...	28·3 $\frac{1}{2}$	Dense fogs twenty times, chiefly in Jan. and Dec. 5 Quantity of rain this year far below average. Force of wind estimated at 5-7 bracas per second.
Mar. 1	...	27·11 $\frac{1}{2}$	...	...	...	...	...	...	...	...	...	...	...	...
July 20	...	...	...	94	...	61 $\frac{3}{10}$	...	...	...	...	...	...	...	...
Dec. 30	...	...	...	...	37	...	...	20	18	...	...	...	N.S. S.S.W. S.S.E.	to 7 bracas
1799	The winter of this year was excessively cold.
1805	The winter of this year was excessively cold.
1806	Snow fell at Lisbon in winter.
1811	Snow fell at Lisbon in winter.
1814	Snow fell at Lisbon in winter.
1815	Snow fell at Lisbon in winter.

N.B.—Pretorius states in his observations in the year 1797, that the place in which he conducted them was the same in which he had made them for twenty years previously, situated at the height of three bracas above the level of the sea, and with instruments exposed to the currents of the north wind. It is to be regretted that the observations for twenty years here alluded to cannot be found.

* The measurements are given in inches and lines.

† Mean of antecedent years was 63° Fahr.

‡ Maximum and minimum observed on these days, but not given.



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From an elaborate and very complete set of meteorological observations in his possession, kept and recorded by himself, Dr. Martin had the kindness to prepare, at my suggestion, the very valuable Charts given in my Parliamentary Report on the Lisbon Epidemic.

Dr. Martin's observations were made at about 50 feet above sea-level, and his barometric readings have been corrected to 32° Fahrenheit.¹

In the following table (table A) will be found the mean results of Franzini's meteorological observations for sixteen years, from 1816 to 1840, inclusive, with details for each month of a regular year. Some of the details are deduced from twenty-three years' observations, to 1848 inclusive.

TABLE A.—Meteorological Means of Sixteen Years.

Seasons.	Months.	Ba- ro- meter.	Temperature.				Mean Temperature.			Days of Rain.	Rain-fall in Millimeters	No. of Cold Days.	No. of Hot Days.	No. of Windy Days.	Characteristic Features of Months.						
			Extremes actually observed.		Regular Extreme.		Min.	Max.	Mean.												
			Min.	Max.	Min.	Max.															
Winter	Dec.	..	29	0	0	0	0	0	0	12.4	86	9	..	6	Cold, and much rain.						
	Jan.	..	26	68	34	61	44.1	55.1	49.5	13.4	91	12	..	7	Very cold, much rain and wind.						
	Feb.	..	26	68	39	65	46.1	58.7	52.4	10.	78	6	..	6	Cold, and moderately rainy.						
Spring	March	..	36	85	41	71	48.3	63.1	55.5	8.3	48	9	4	8	Variable, little wet and windy.						
	April	..	37	84	44	76	50.9	66.1	58.5	9.6	53	9	6	9	Variable, windy, and moderately rainy.						
	May	..	42	89	48	81	54.7	70.5	62.6	8.7	38	5	5	7	Warm and variable.						
Summer	June	..	48	97	53	88	60.4	77.1	68.7	4.	14	..	10	6	Warm and dry.						
	July	..	51	105	56	94	62.6	81.1	71.9	1.4	5	..	13	7	Very warm and very dry.						
	August	..	53	99	57	92	62.8	81.1	71.9	2.	5	..	12	9	Very warm, very dry, and windy.						
Autumn	Sept.	..	48	92	54	88	61.0	77.1	69.0	6.3	35	..	10	5	Warm, and a little rainy.						
	October	..	40	83	48	78	56.2	69.8	63.0	10.4	83	2	4	6	Warm, and very windy.						
	Nov.	..	34	75	40	70	50.4	61.8	56.1	11.	91	5	..	7	Cold, and very rainy.						
Absolute Extremes		..	26	105					
Means		30.24	34	94	53.6	68.2	60.8*	97.5					
Totals of certain Means										622	57	58	83	

* Franzini elsewhere estimates the mean annual temperature of Lisbon at 61° (Fahr.), said to be deduced from eighteen years' observations.

¹ It was at first contemplated to prepare a set of charts, maps, and diagrams,

The headings of the columns (Table A) explain their contents. The first two with the heading "Extreme Temperatures actually observed", indicate the greatest amount of cold or heat actually observed in the period of sixteen years in the respective months. The two succeeding columns, with the heading "Regular Extreme Temperatures", indicate the greatest cold or heat corresponding to the regular mean temperature, and they are the *means* deduced from *all the extremes* observed in the same months.

This table would indicate that the quantity of rain collected in Lisbon in an ordinary year amounts to 622 millimetres (24·448 inches); but this quantity is probably above the true average (see p. 336), being about two inches over what falls in London and Paris; but there is a great difference in the distribution of the fall of rain through the several months. The rain-fall of London for 1855 was 21 inches, and for 1856 was 21·9 inches, which is slightly below the average.

It is further to be remarked that the number of rainy days, and the quantities of rain, are deduced from the observations of twenty-three years (to 1848 inclusive).

If the annual rain-fall be represented by 100, the quantity which falls in the four winter months corresponds to 48; that in the two months of spring to 15; that of the four months of summer to 9; and that of the two months of autumn to 28.

The following table (Table B) shows the results of the maximum, minimum, and mean barometric pressure, with the days in which the maximum and minimum were observed; likewise the maximum, minimum, and mean readings of the thermometer for the ten years between 1781 and 1797, as recorded by Pretorius.

It will be seen that the barometer never descended below 27·3 (December 23rd, 1786); also that the thermometer was not observed to descend below 29° Fahrenheit (December 31st, 1788), in those years. The thermometer once recorded 106° (August 13th, 1784). Once only in the period of twenty-three years observed by Franzini, did it approach this elevation. A greater depression has, however, been observed in this latter period, viz., to 26°.

for the ATLANTIS, similar to those which accompany my Parliamentary Report on the Lisbon Epidemic; but this has been found not to be practicable. Although the addition of these charts, etc., would have been useful, they are by no means indispensably necessary. I have, however, thought it as well to give descriptive references to them, in case the reader may meet with them.—R. D. L.

TABLE B.—Maximum, minimum, and mean of barometer, 1781–1797.

Year.	Months, and Day of Months.	Maximum.	Months, and Days of Months.	Minimum.	Mean of Year.
1781	- December 29th -	28·8	December 9th	27·5	28·2
1782	- January 26th -	28·8½	April 13th	27·7	28·3
1783	{ February 4th - November 16th and 19th - }	28·8	November 2nd	27·5	28·2½
1784	- April 21st -	28·7½	December 27th	27·5	28·2
1785	- January 9th -	28·6	February 17th	27·6	28·2½
1786	{ January 28th - December 13th - }	28·8	December 23rd	27·3	28·2
1788	- January 17th -	28·7	„ 13th	27·5¾	28·2¾
1791	- December 27th -	28·8¼	November 19th	27·6	28·2
1794	{ February 7th - „ 8th - }	28·8½	December 5th	27·5	28·4
1797	- December 27th -	28·10	March 1st	27·11½	28¾

Thermometer (Fahrenheit).

1781	- July 11th -	99	January 10th	34	63				
1782	- June 20th -	97	„ 13th	32	63				
1783	- - -	-	- - -	-	61½				
1784 ²	{ June 15th - July 13th - „ 16th - August 13th - „ 14th - }	97 102 99 106 103	} December 4th	30	62				
	1785	- - -				94	- - -	36	62¼
	1786	- - -				-	-	-	-
	1788	- July 19th -				93	„ 31st	29	63 -
1791	- August 28th -	100	{ February 8th „ 9th }	34	62½				
1794	- - -	93	January -	34	61 -				
1797	- July 20th -	94	December 30th	37	61 -				

As already stated, I am indebted to Senhor Franzini for the elements of table A, which exhibits the mean results of sixteen years observations of the meteorology of Lisbon between the years 1816 and 1840 inclusive.

The following general conclusions have been deduced from the observations of this accomplished academician:—

Barometric pressure of the atmosphere.—The mean height of the barometer is stated to be 762·7 millimetres (30·027 inches). In general the barometer reaches its greatest elevation in the clear days of the winter season, when the prevailing winds are N. and N.E.; its least elevation is during the prevalence of the S. and S.W. winds.

² The monthly means of the thermometer for this year are given by Pretorius, and, as well as the mean for the whole year, show some remarkable elevations. They are as follows:—

January	54	...	May	67	...	September	67
February	55	...	June	70	...	October	60
March	57	...	July	73	...	November	54
April	57	...	August	73	...	December	51

Exceptional days of very elevated temperature are less effectual than would be supposed in raising the mean temperature of the month or year. In this respect, perhaps, more than any other, the results of scientific differ from those of popular experience. Thus this year (1784) would probably popularly be remembered as the hottest year for a long period, whilst it is shown to have had a less mean temperature than that which followed it.



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Winds.—The following are the results of Franzini's observations in reference to the prevailing winds. The N. wind prevailed on 144 days; the S.W. on 138 days; the N.W. on 124 days; and all the rest in due proportion. There were 129 days of wind more than usually strong, and 12 days of actual storm.

Franzini's observations are summed up as follows:—

Barometer,	Mean, 762·7 millimetres (30·027 inches).
Thermometer,	„ 61° Fahrenheit.
Rain-Fall,	„ 538 millimetres (22·952 inches).
Prevailing winds,	„ N.N.W. S.W.
Rainy days,	„ 97·5
Cold days,	„ 57
Hot days,	„ 58
Windy days,	„ 83

The following abstract from Franzini's results will enable us to appreciate more readily the departures from the normal meteorological conditions, in the six months from July to December inclusive, these being the months of more immediate interest in connection with our present epidemiological inquiries.

—	Actual Extremes.		Mean Temperature.			Days of Rain.	Rain in Inches.	Rain in Millimetres.	Hot Days.	Cold Days.	Days of Wind.
	Min.	Max.	Min.	Max.	Mean.						
July ...	51	105	62·6	81·1	71·9	1·4	...	5	13	...	7
August ...	53	99	62·8	81·1	71·9	2·	...	5	12	...	9
September ...	48	92	61·0	77·1	69·6	6·3	...	35	10	...	5
October ...	40	83	56·2	69·8	63·0	10·4	...	83	4	2	6
November ...	34	75	50·4	61·8	56·1	11·	...	91	...	5	7
December ...	29	67	45·5	56·6	51·1	12·4	...	86	...	9	6

On comparing these results with those deducible from the observations of Pretorius, table A, we find that in the year of maximum temperature, 1784, the greatest elevation of the thermometer was on August 13th, when it reached 106°, being one degree higher than Franzini's maximum.

The means for July, August, and September, 1784, likewise exceeded the general means given by Franzini, as will be seen by the following summary:—

—	July.	August.	September.
Means for 1784 ...	73·0	73·0	71·0
General means from 16 years' observation	71·9	71·9	69·6

But for the remaining three months of the year, the means of 1784 were below the average.

—	October.	November.	December.
Means for 1784 ...	60	54	51
General means of 16 years' observation	63	56.1	51.1

The thermometric means of September, October, November, and December, 1857, as given by Dr. Martin, are higher than the average of the nine preceding years, and also than those of the very remarkable year 1784, as thus shown.

	September.	October.	November.	December.
Means of 1784	71	60	54	51
Means of 9 years antecedent to 1857	70.96	64.9	57.78	52.69
„ of 1857	72	66.5	59.5	56

The hygrometric means of the same months in 1857, are in two instances above, and in two instances below, the average, thus:—

—	September.	October.	November.	December.
Hygrometric means of 9 years	72	77	80	81
„ 1857	71.5	76.5	82.5	85

The Charts 1 and 2, which accompany my Report already alluded to, were drawn up by Dr. J. Martin, at my suggestion, and on a plan indicated by me. They contain in a convenient and condensed form the results of nine consecutive years' observations specially arranged to illustrate the relation of the meteorological and epidemiological conditions of the years 1856 and 1857, the former rendered remarkable by a visitation of cholera of great severity, the latter rendered still more so by the yellow fever epidemic. Although these charts do not accompany the present paper, the following descriptive references to them may not be out of place:—

The meteorological results are deduced from three observations made daily at 9 A.M., 3 P.M., and 9 P.M. respectively.

The barometer used by Dr. Martin is suspended about fifty feet above the mean level of the Tagus, and its indications have been corrected uniformly to the temperature 32° Fahrenheit.

The thermometers are placed in the open air, in the shade, about six inches from the stone wall of the house, with a northern aspect. They are screened from reflected heat, and stand about twenty feet above the ground. The instruments have occupied the same place for the whole term of nine years during which the observations have been conducted.

In charts 1 and 2, the perpendicular line in each day of the

month in the hygrometric, thermometric, and barometric divisions respectively, shows the daily range of the hygrometer, thermometer, and barometer. The extremes of these lines correspond to the maxima and minima, and the calculated means occupy nearly the centres.

The hygrometric scale is reversed, in order not to interfere, by too near approximation, with the higher indications of the thermometer. The upper part, therefore, of this scale shows dryness, the lower moisture.

The dotted, continuous, and broken lines, crossing horizontally through the table in each month, show the means and the mean maxima and minima of the similar months respectively of the nine preceding years.

In the chart relating to the cholera epidemic, the blue portion represents the daily mortality with reference to the scale of cases; and the surface line of the red, with reference to the same scale, gives the amount of new cases daily.

The dotted black lines, with reference to the proportional scale indicate, the daily per-centage of deaths, relatively to the amount of new cases on the same day.

Similar observations apply to that portion of chart No. 2, relating to the mortality and number of attacked in the yellow fever epidemic.

For the convenience of those of my readers who may not have an opportunity of consulting the charts themselves, the following maxima, minima, and means, for 1856, are thrown together in a tabular form from these interesting and valuable charts.

	June.				July.				August.				September.			
	Max.	Min.	Mean.	Mean of 9 Yrs.	Max.	Min.	Mean.	Mean of 9 Yrs.	Max.	Min.	Mean.	Mean of 9 Yrs.	Max.	Min.	Mean.	Mean of 9 Yrs.
Hyg.	94	40	64	67	87	31	62	64	92	28	63	65	92	35	70	72
Ther.	90°	58°	70°·7	69°·77	94°	62°	74°·9	73°·81	93°	67°	75°·58	74°·67	85°	58°	70°·82	70°·96
Bar.	30·20	29·80	30·04	30·025	30·14	29·84	30·2	30·02	30·19	29·79	30·00	29·99	30·26	29·79	30·028	29·999

We may next examine the similar results for 1857.

	September.				October.				November.				December.			
	Max.	Min.	Mean.	Mean of 9 yrs.	Max.	Min.	Mean.	Mean of 9 yrs.	Max.	Min.	Mean.	Mean of 9 yrs.	Max.	Min.	Mean.	Mean of 9 yrs.
Hygro.	95	48	...	72	100	53	...	77	100	65	...	80	97	67	...	81
Ther.	82°	62	...	70°·96	79°	54°	...	64°·9	69°	50°	...	57°·78	66°	40°	...	52°·69
Bar.	...	...	...	29·999	...	...	...	29·996	...	...	...	30·003	...	...	...	30·112

Comparing the thermometric means from the above table, we find that in June, July, and August, 1856, the actual mean of the



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organized an Observatory as that of the Infant Dóm Luiz, will ere long supply the desideratum here indicated, by the establishment of one or more subsidiary points of observation at a suitable locality in some central situation.

Accurate and extended observations upon the temperature, evaporation-phenomena, and chemical and microscopic elements of the Tagus water at the several conditions of the tide, constitute another desideratum, and the want of information on these points must be regarded as a lacune much to be regretted.

It is only by the combined study of all the possible physical conditions of the seats of epidemic visitations that we can hope to arrive ultimately at some intelligible solution of the now obscure phenomena of their modes of invasion, propagation, and ultimate extinction.

SPECIAL CLIMATOLOGY OF LISBON,

For the years of Epidemics 1855, 1856, 1857, according to the Meteorological Observations of the Observatory of the Infant Dom Luiz.

§. Instruments and manner of Registration.

Altitude.—The elevation of the observatory above the mean level of the ocean is 97·2 metres (318·903 feet), counted to the floor of the terrace. The height above this level of the free surface of the mercury in the barometer is 95·1 (312 013 feet), and that of the mouth of the exterior opening of the udograph placed on the terrace is 99·2 (325·465 feet).

Height of building.—The elevation of the observatory above the ground immediately adjacent, counted to the parapet of the terrace, is 13·3 metres (43·635 feet). The mean elevation of the chamber of the instruments is 10·6 (34·777).

Barometer.—The barometric readings are referred to the standard barometer. The reduction of the readings to 0° is done by the tables of Hoeghens. The daily means are deduced from the readings of the four daily hours of observation—9 A.M., noon, 3 P.M., and 9 P.M.

Thermometers.—All the thermometers are verified by the standard of the Kew Commission. The mean daily temperatures are deduced from the temperatures of 9 A.M. and 9 P.M., and from the absolute maximum or minimum.

A minimum thermometer (Rutherford's model, with colourless alcohol), placed on the grass, gives the minimum of each night.

Psychrometer.—The psychometric deductions are made by the tables of Stierlin. The degree of humidity of the air is referred to that of complete saturation represented by 100.

Ozonometer.—Every day at 8 A.M. there is exposed to the air, but in such a manner as to be sheltered from rain and the direct rays of the sun, a piece of paper, prepared with the amido-iodu-
retted solution. This paper is removed at 8 P.M. and another substituted. The paper which has been exposed for twelve hours is immediately on its removal immersed in distilled water. The degree of colouration which the paper has assumed is registered by a corresponding number on the ozonometric scale. This is a chromatic scale, with ten gradations, of an azure-violet-ash colour, the most intense being represented by 10, and those less so by 9, 8, etc., respectively; Zero (0) expressing white or the absence of colouration, and consequently of ozone reaction. An approximation to 0.5 is recorded for each of the gradations. The equivalent number of the colour which the paper acquires by exposure for twelve hours is that which is termed *mean ozonometric degree*. The daily mean, daily ozonometric mean, is the mean of the results obtained from 8 P.M. of one day to the corresponding hour of the next.

The scale of colours employed is, as will be seen from the foregoing observations, that of Schönbein.

Clouds.—The nomenclature employed for the description of the configuration of the clouds is that of Howard. The portions of the heavens covered or uncovered is estimated by an assumed system of tenths; the figure 10 representing the absence of all cloud, 0 the state of the heavens when completely covered, and the numbers, from 0 to 10 the corresponding intermediate states. These figures designate the conditions understood as *mean degrees of serenity of the heavens*. When, with the sky generally covered, at some intervals the sun is uncovered, or some portions of the blue of the heavens is rendered visible, the term "*cloudy and clear*" is employed. When the serenity is marked = 10 (maximum) and some cloud is noticed occasionally in the day, this is so stated.

Decades.—In the months of thirty-one days, the last decade includes the 31st. When February has twenty-eight or twenty-nine days, the last decade is deficient one or two days accordingly.

Hours of observation.—The hours of observation uniformly employed are 9 A.M., noon, 3 P.M., and 9 P.M. (I do not find it stated when the night minimum of the thermometer on the grass is read, probably in the morning).

Signs and abbreviations.—S. signifies *strong* south wind; N. *violent* north wind; E. by N.W. implies two currents, a superior east and an inferior north-west; N. St. by S.C. indicates *stratus* (cloud) driving to the north superiorly, and *cumulus* to the

south inferiorly. C. in the columns of the direction of the winds implies *calm*. C., Ci., Ni., St., Ci.-C., C.-Ni., denote *cumulus*, *cirrus*, *nimbus*, *stratus*, *cirro-cumulus*, *cumulo-nimbus*, etc. c. denotes *clear*. (See annexed Tables, Sheets III. IV. V. VI.)

Anemograph.—The anemograph employed is that of Osler, somewhat modified. It registers at every instant the *direction* and *velocity* of the wind.

Udograph.—This instrument (like all of its kind) is so constructed as to register the rain and the hours at which it rains.

Meteorological year.—The year of observations, as recorded at Lisbon (Royal Observatory) is as follows:—*winter*—December, January, February; *spring*—March, April, May; *summer*—June, July, August; *autumn*—September, October, November.

§ Discussion of the Barometric and Thermometric observations.

In the accompanying tables are presented the means of the principal meteorological elements as recorded in the Royal Observatory. They comprise the maximum, minimum, greatest variation, and monthly means of barometric pressure in millimetres (reduced to sea level); similar thermometric data (thermometer centigrade), the number of rainy days, quantity of rain per month, direction and velocity of the winds, and the ozonometric results by day and night for the years 1855, 1856, and 1857. (See tables 2, 3, 4, etc., Sheet I.)

We may now compare some of the barometric observations year by year and month by month. (See Sheet VII.)

We have no monthly averages of the barometric pressure at Lisbon (at least not in similar terms), to enable us to compare the foregoing data with the standard phenomena for each month. The years 1855 and 1856 are in themselves too remarkable to admit of an average being taken from their monthly elements, wherewith to compare those of 1857. The following observations seem, however, worthy of attention.

The maxima of 1857 are below those of 1855, in every month except October, November, and December. (Sum. A. Sh. VII.)

The minima of 1857 are likewise below those of 1855, except in February, March, May, and December.

The maxima of 1857 are likewise less than those of 1856, except in January, April, June, and July; while, except in May, June, August, October, and December, the minima of 1857 are greater than those of 1856.

We may next examine the monthly barometric means for 1855, 1856, and 1857.



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have been far more uniform than in the corresponding or any other period of either of the other years. By referring again to summary A, it will be seen that the same months of 1857 presented a moderately high maximum pressure, not exceeding 763·39 (April), nor falling below 759·79 (May).

In the absence of monthly averages based on observations of former years, I do not see that the barometric results admit of more specific deductions being drawn with regard to the atmospheric pressure during 1857.

We will next examine the thermometric data of 1857, in connection with which we have seen that ample means exist for comparing them with the similar results of former years. (See Summary D, Sheet VII.)

From this summary it will be seen that in February, March, April, May, July, and October, the maxima of 1857 exceed those of 1855 and 1856. In every instance, except one, August, the maxima of 1857 are higher than those of 1855. From February to July, 1857, a steady increase in the maxima will be observed; and, with the exception of the maximum for June, 1857 (32°·9), which is below that of June, 1856 (35°·1), these maxima are in excess of those of the two antecedent years. It is to be remarked, however, that the minima of 1857 are, with the exception of those of June, September, November, and December, *below* those of 1855 and 1856.

The highest maxima for the three years, 1855, 1856, 1857, will be found to have occurred in July, 1857, when the thermometer marked 37·5 Centigrade, or 99°·50 Fahrenheit

The lowest minimum occurred in January, 1855, when the thermometer sunk to 0°·4 Centigrade, 32·72 Fahrenheit, or a fraction above the freezing point Fahrenheit.

The following summary will show the greatest monthly variations compared for the years under observation.

SUMMARY E.—Thermometer (Centigrade), greatest monthly variations for 1855, 1856, 1857.

	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1855	14·8	11·6	11·1	7·8	9·2	16·1	17·2	20·2	13·6	14·8	13·8	15·2
1856	12·0	12·4	12·4	10·6	16·5	23·9	19·2	21·4	22·7	16·4	17·3	17·8
1857	14·5	16·8	18·2	20·3	18·8	21·5	23·7	16·8	18·9	19·8	12·3	15·9

The variations for February, March, April, July, October, and November, 1857, are very remarkable; and, with the exception of the latter month, in which the variation is considerably less in 1857, the monthly range of the thermometer was much greater in 1857 than in 1855 or 1856.

Months.	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .	6 ^h .
June, 1856 -	400	412	379	323	363	348
July, ,, -	470	476	461	472	425	434
August,, -	384	386	373	334	312	282
Totals of Season	1,254	1,274	1,213	1,129	1,100	1,064

Months.	1 ^h .	2 ^h .	3 ^h .	4 ^h .	5 ^h .	6 ^h .
June, 1856 -	13·3	13·7	12·6	10·8	12·1	11·6
July, ,, -	15·2	15·4	14·9	15·2	13·7	14·0
August,, -	12·4	12·5	12·0	10·8	10·1	9·1
Means of Season	13·6	13·9	13·2	12·3	12·0	11·6

Months.	N.	N.N.E.	N.E.	E.N.E
June, 1856 -	1,173	807	242	214
July ,, -	1,493	71	22	20
August ,, -	1,725	410	206	56
Totals - -	4,391	1,288	470	290
Mean velocities } of Season - }	18·20	16·95	10·22	11·16

Months.	N.	N.N.E.	N.E.	E.N.E
June, 1856 -	0·0	0·0	0·0	0·0
July ,, -	0·0	0·0	0·0	0·0
August ,, -	0·0	6·2	0·0	0·0
Totals of Season	0·0	6·2	0·0	0·0



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found noted the plus or minus difference shown for 1857. It will be remarked that the means of this year are below those of the 16 year period in all the months except July, August, September, and November.

I must here observe, that I entertain great doubts as to the propriety of comparing the means of 1857, as deduced from the records of the Royal Observatory, with those of Colonel Franzini's 16 years period of observation. As already noted, the Observatory of the Infant Dom Luiz is placed at a very considerable elevation, in a situation exposed to the north-west and east winds, while the distance of the Observatory from the Tagus, and from the populous parts of the city in the flat of the town, is very considerable (1,226 metres, $\frac{3}{4}$ of a mile). There is every reason to suppose, though I believe it is not yet proved by direct comparison of observations, that the extreme and mean temperature in the lower parts of the city must sensibly exceed those on the elevated grounds, in which the diurnal play of the sun's heat is more or less affected by the prevailing winds from N., N.E., and N.W. The proximity to the Tagus, the dense population, the houses, fires, and above all the reflected heat of the sun thrown back from the somewhat amphitheatrically arranged group of hills which border the river, must unquestionably raise the mean temperature of both night and day in the lower parts of the city. It was in this latter situation that Dr. Martin's observations were conducted; and so also, I presume, were those of Franzini, though I have no positive information as to the precise locality in which they were conducted.

The following summary exhibits the means and mean maxima and mean minima for nine years, deduced from Dr. Martin's observations, conducted, as already stated, in a locality contiguous to the Tagus, to the centres of business and population, and to the main force of the epidemic of 1857. They somewhat exceed those of Franzini. (See Summary H, Sheet VII).

If we compare the monthly means from this table reduced to Centigrade, with those of 1857 taken from the records of the Royal Observatory, we shall find that in every instance except one (July), the means of 1857, as recorded at the Observatory, are below those of the nine year period observed by Dr. Martin. The following summary will exhibit the difference more clearly.

SUMMARY I.—Monthly Thermometric means for nine years (Dr. Martin).

—	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
Thermometer (Fahrenheit) - -	69·77	73·81	74·67	70·96	64·9	57·78	52·69
Equivalent in Centigrade - -	20·983	23·228	23·705	21·644	18·277	14·322	11·494
Means of 1857, taken at R. Obsty.	19·85	23·99	21·22	20·88	17·18	14·37	9·82

I may here be allowed to remark that I regard Dr. Martin's observations as entirely reliable, from his well known scientific accuracy, and I also consider them as those which throw most light on the meteorological questions relating to the epidemic. They show, as already stated, an excess of temperature in the epidemic months of 1857.

§ Discussion of Udographical, Anemographical, and Ozonometrical Observations, etc.

Average rain-fall per month, and rain-fall in 1855, 1856, and 1857.

—	Jan.	Feb.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average.	91	96	33	52	41	10	6	6	37	78	84	91
1855	55·8	217·0	126·5	55·6	90·6	1·0	13·5	0·8	94·1	198·5	69·9	120·0
1856	291·6	99·8	151·2	131·9	16·9	0·0	0·0	8·5	19·4	66·7	4·2	89·3
1857	74·4	132·2	80·0	10·0	72·0	36·4	0·3	34·9	12·9	85·8	231·0	37·7

The rain-fall, number of rainy days, water evaporated, and predominant winds are here shown for each of the epidemic months of 1857.

1857.	Rain in Millimetres.	Number of Rainy Days.	Water evaporated.	Predominant Winds.
September	- - 19·9	16	215·60	S.W., N.W., S.S.W. (var.)
October	- - 85·8	18	173·44	N.N., N.N.W., N.N.E.
November	- - 231·0	18	78·66	N.E., W.S.W., N.E.
December	- - 37·7	4	92·64	N.N.E. and N.

It is to be observed that the three years 1855, 1856, 1857, present an extraordinary increase of rain-fall, and in a sort of descending scale from 1855. The average rain-fall is taken as 24 inches; in 1855, it was over 41 inches; in 1856, more than 34 inches; and in 1857, over 32, or nearly 9 inches above the average.

By reference to table 1, it will be found that the highest total rain-fall at Lisbon (on record) amounts to $44\frac{1}{100}$, being that of the remarkable year 1785. It may also be observed that this large amount was gradually reached as it were, there having been a progressive increase in the total annual rain-fall from 1783, and, as in 1855, the rain-fall was not reduced to the average in the succeeding year, but appears to have decreased gradually. Does there exist at Lisbon a rain cycle, gradually advancing from year to year to a maximum, and then gradually falling to an average? It may be that a succession of rainy years gradually influences the constitution of the population, till with other current causes, a climax of complicated morbid elements

is brought about which leads to the outbreak of epidemic disease. For more full details, see Parliamentary Report, Part III., p. 93.

Abundant information as to the winds which prevailed in 1857, their force, direction, and the quantity of rain corresponding to each wind, will be found in the summaries (Tables 6 and 7, Sheet II). Unfortunately, however, we possess no averages of former years wherewith to compare these results. The total space travelled over by winds in 1857, amounted, for all the winds, in all the months and seasons, to 143,354 kilometres. Of this amount, the greatest number of kilometres, 34,193, was travelled by the N.N.W.; the least, 990, by the S.S.E. The north was the most frequent wind, 670; the S.E. the least frequent, 51 times. The following summary shows the winds in the order of kilometres travelled by each, with the corresponding velocities, and the frequency of the several winds (number of times which each wind blew). (See Summary K, Sheet VII).

The sky was observed to be serene, unclouded, 176 days out of the year, while it was covered 140 days. A certain amount of stagnation of the atmosphere was observable in September; the velocity of the wind was 0 on the 1st, 2nd, 5th, 6th, 7th, 12th, 13th, 16th, 17th, 19th, 20th, 23rd, 24th, 29th, and 30th. In October the velocity was 0 only on the 15th, from 3 to 4 A.M., and on the 28th from 1 to 2 A.M. There were only two days each in November and December, in which this state prevailed, and did not last longer than from one to two hours on each occasion.

The next summary contains a comparative view of the monthly ozonometric means so far as observed, for 1855, 1856, 1857. The first observation was made in July 1855, and from this date till December, 1856, the diurnal mean is that recorded. From December, 1856, the means by day and those by night are separately given. I find nothing of sufficient importance to dwell on in the ozonometric conditions of these years; and indeed in my opinion the distance of the observatory from the centre of population and epidemic ravages, deprives these observations of much of the value they would otherwise have in relation to the present inquiry. (See *Ozone Summary*, Sheet VII).

The highest ozonometric condition of the atmosphere noticed was in November 1857, when it reached 7.4 (by night); the lowest was in July, 1855, when it was but 2.9 (diurnal mean).

I would here beg leave to suggest that, as a very long series of years must elapse before the observations of the Royal Observatory are sufficiently extended to admit of a series of reliable averages being deduced from them, and as, moreover, the distance of the Observatory from the Tagus, the centre of population and of epidemic visitations, is too great to admit of the closest appli-



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Table of the monthly mean of the dew-point at Lisbon, for the mornings, afternoons, and evenings respectively, and for the day, during the years 1854, 1855, 1856, and 1857.—*Continued.*

1855.					1857.				
January	42·43	45·30	44·01	43·913	January -	42·97	43·83	43·29	43·363
February	49·98	50·63	50·25	50·286	February -	44·42	47·41	45·71	45·846
March	48·46	50·72	47·91	49·03	March -	49·13	50·04	48·02	49·063
April	52·14	53·67	51·67	52·493	April -	49·40	49·95	48·89	49·413
May	52·49	53·60	51·97	52·686	May -	53·94	54·80	53·38	54·04
June	54·99	56·61	53·58	55·06	June -	59·64	60·42	57·42	59·16
July	60·31	60·45	58·55	59·57	July -	61·48	60·38	59·53	60·463
August	60·85	60·31	60·71	60·623	August -	60·91	60·52	59·99	60·473
September	59·97	60·45	58·96	59·793	September	62·20	61·95	60·95	61·70
October	56·24	56·88	55·87	56·33	October -	56·80	56·99	56·14	56·643
November	50·02	52·03	49·29	50·446	November	54·14	56·11	54·46	54·903
December	46·91	49·23	46·92	47·686	December	43·55	48·32	45·05	45·64
Annual Result }	52·8991	54·1566	52·4741	53·176	Annual Result }	53·215	54·226	52·735	53·3916

The following abstract shows the more important results of these tables, compared by the means for the epidemic months, July to December inclusive, and for the years 1854, 1855, 1856, and 1857.

If we compare the means for 1854, 1855, and 1856, with those for 1857, we shall obtain the following results for 1857:—

July.—There was an elevation of the dew-point in July, when it reached a maximum, 60·25. The elastic force of vapour was likewise at a maximum in the same month. The weight of vapour to the cubic foot of air was below the maximum in this month, as 5·83 (1857) is to 6·005 (1855).

August.—The dew-point in this month was above the minimum (59), but was below the maximum, as 59·2 (1857) is to 60·75 (1854 and 1855). The elastic force of vapour was considerably above the minimum, ·373 (1856), but below the recorded results, ·553 (1854) and ·568 (1855) respectively. The weight of vapour to the cubic foot of air was above the minimum, 5·63 (1856), but below the recorded results, 6·05 (1854), and 6·075 (1855).

September.—The dew-point was higher than in the preceding years, having reached 60·5. The elastic force of vapour was above a minimum, ·328 (1856), but below the maximum, ·557 (1854). The weight of vapour to the cubic foot of air was below the maximum, 6·08 (1854), but above that of the other years.

October.—The dew-point was at a minimum, 54·1. The elastic force of vapour, ·457, was above the minimum, ·306 (1856), but below the results of the other years. The weight of vapour to the cubic foot of air was at a minimum, 5·08.

November.—The dew-point was at a maximum 54·5. The elastic force of vapour was likewise at a maximum, ·456. The weight of vapour to the cubic foot of air was also in excess.

December.—The dew-point, 50, elastic force of vapour, .411, and the weight of vapour to the cubic foot of air, 4.62, were all in excess over the similar elements of the corresponding months in the previous years.

It will be observed that in 1857 the dew-point fell but 10.25 degrees from July to December. The minimum depression for the same period in the three preceding years was 12.85.

It will be thus seen that the Lisbon epidemic of 1857 had no such necessary connection with a high dew-point as would be made probable from the results obtained by other inquiries.³

The accompanying sheets, III., IV., V., VI., present for each of the epidemic months of 1857 a summary view of the relations of the meteorological elements, so far as observed, to the rise and progress of the epidemic of yellow fever.

CHOLERA, 1856.

The admirable records of the Royal Observatory of the Infant Dom Luiz offer, in some respects, such facilities for the study of the relations of meteorological and epidemiological conditions, that I deem it worth while to append the following summary of the observations recorded during the summer season, 1856, months of June, July, and August, during which period an epidemic of cholera, of considerable force and extent, prevailed at Lisbon.

The state of the barometer, thermometer, and hygrometer, with the force and frequency of the winds, the quantity of rain, and ozone, etc., will be found given in maximum, minimum, and means, for the several months and for the winter season.

We annex a summary of the ozonometric conditions, as observed by day and night for the several months and seasons of 1856. The results are estimated in degrees of ozonometric reaction on the test-papers of Schönbein.

The ozone, it will be observed, is at a minimum by day and night in the summer season.

Summary of ozonometric observations in the several months and seasons, 1856.

Seasons.			By night	By day	Seasons.			By night	By day	
Cold	{	December—1855	172.5	152.0	Warm	{	June - -	118.5	96.0	
		January -	202.5	160.0			{	July - -	122.0	90.5
		February -	153.5	130.5			{	August -	143.0	97.0
			<u>528.5</u>	<u>442.5</u>				<u>383.5</u>	<u>283.5</u>	
Moderate	{	March -	168.0	126.5	Moderate	{	Sept. -	148.5	121.0	
		April -	146.5	126.0			{	Oct. -	147.5	124.5
		May -	134.0	104.5			{	Nov. -	142.5	106.0
			<u>448.5</u>	<u>357.0</u>				<u>438.5</u>	<u>351.5</u>	

³ See especially the work of Dr. Barton on the epidemic of New Orleans, in which it is laid down as a cardinal point in epidemiology, that high dew-point invariably attends the development of yellow fever.

The accompanying abstract shows the winds predominant during the cholera months, June, July, August.

Winds predominant in

JUNE.		JULY.		AUGUST.	
Days 20 to 25	q. N.W.	Days 1 to 5	q. N.W.	Days 1 to 5	q. N.W.
„ 25 to 30	q. S.W.	„ 5 to 10	N.N.W.	„ 5 to 10	N.N.W.
		„ 10 to 15	N.N.W.	„ 10 to 15	q. N.W.
		„ 15 to 20	q. N.W.	„ 15 to 20	q. S.W.
		„ 20 to 25	q. S.W. & N.W.	„ 20 to 25	q. N.W.
		„ 25 to 31	q. N.W.	„ 25 to 31	q. N.W.

Number of those attacked by Cholera in

JUNE.		JULY.		AUGUST.	
Days.	Attacked.	Days.	Attacked.	Days.	Attacked.
19 to 20	8	1 to 2	41	1 to 2	217
20 to 21	13	2 to 3	34	2 to 3	176
21 to 22	13	3 to 4	33	3 to 4	198
22 to 23	15	4 to 5	77	4 to 5	128
23 to 24	17	5 to 6	60	5 to 6	170
24 to 25	13	6 to 7	69	6 to 7	129
25 to 26	19	7 to 8	57	7 to 8	110
26 to 27	23	8 to 9	55	8 to 9	115
27 to 28	41	9 to 10	59	9 to 10	103
28 to 29	45	10 to 11	70	10 to 11	109
29 to 30	43	11 to 12	52	11 to 12	99
30 to 1	34	12 to 13	67	12 to 13	97
		13 to 14	53	13 to 14	83
		14 to 15	83	14 to 15	69
		15 to 16	75	15 to 16	68
		16 to 17	98	16 to 17	68
		17 to 18	79	17 to 18	56
		18 to 19	84	18 to 19	56
		19 to 20	77	19 to 20	59
		20 to 21	126	20 to 21	58
		21 to 22	141	21 to 22	48
		22 to 23	89	22 to 23	34
		23 to 24	135	23 to 24	42
		24 to 25	114	24 to 25	33
		25 to 26	156	25 to 26	34
		26 to 27	152	26 to 27	30
		27 to 28	202	27 to 28	22
		28 to 29	171	28 to 29	22
		29 to 30	172	29 to 30	23
		30 to 31	156	30 to 31	16
		31 to 1	227	31 to 1	21
Totals	284	- - -	3,064	- - -	2,493

The diagram annexed to my Parliamentary Report gives a graphic representation of the more important meteorological conditions of the quarter comprising the months of June, July, and August, 1856, and their relations to the cholera epidemic of the same period.

From a study and comparison of the curves in that diagram



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ART. IV.—*On the change of Caseine into Albumen, with some Observations on Lactic Fermentation.* By WILLIAM K. SULLIVAN.

ABOUT four years ago, I procured two samples of cow's milk for the purposes of an investigation, which I proposed to make upon the influence which age, temperature, food, and other variable conditions exert upon the relative proportion of the different fats composing butter. The milk, just drawn from the cow, was introduced into clean well-stoppered glass bottles, and stoppered in such a way as to leave no air between the stoppers and the milk. Other occupations having prevented me from proceeding at the time with the inquiry, the bottles of milk were put aside in a cool place, not subject to very great extremes of temperature, and only examined during the last month. As I believe that the results of this examination may possess some interest in connection with the composition of caseine and its relation with albumen, and also with some of the interesting experiments recently made by M. Pasteur upon fermentation, I have thought them worth publishing.

For some time after the bottles had been laid aside, no coagulation of the caseine took place. Ultimately it separated in the usual way, leaving a perfectly clear, blueish liquor. After some time the coagulum gradually disappeared, leaving only the butter floating through the liquid, which in time became almost colourless. Granulations also appeared in the butter, some of which rested on the bottom of the bottles and others attached themselves to the glass. No further change was noticed in the appearance of the contents of the bottles, which remained however unopened for about two years after the formation of the first granules.

The contents of one of the bottles were poured upon a filter; a perfectly clear liquid passed through, having a feeble yellowish tint and a strong acid reaction. The substance on the filter consisted almost wholly of the butter, mingled however with a small quantity of a nitrogenous body like coagulated caseine, and affording many of the reactions of that substance. It would however be impossible to say that it was unaltered, as the reactions which the coagulated forms of all the albuminous bodies afford are so similar, that it is always difficult, if not indeed impossible in the present state of chemistry, to determine which of these bodies we may be dealing with.

Part of the glycerides composing the butter had been decomposed and their acids set free. The granules which had been

observed to form upon the sides of the bottle, consisted of the solid acids of the series $C_n H_n O_4$ in a crystallized state. This fact is interesting in connection with the chemical changes which the substance known as *bog butter* must have undergone in time, as I shall show in a future paper.

A portion of the filtered acid solution was distilled in a retort; a faintly acid liquor came over smelling strongly of butter. When neutralized with baryta, and the solution evaporated and set aside over sulphuric acid, crystals were obtained which had the characters of baryta salts formed with the volatile acids of butter.

When a portion of the filtered acid liquor was treated with moist freshly prepared oxide of zinc, so as to neutralize a considerable portion of the free lactic acid, and then heated, it coagulated exactly like a solution of albumen. A portion of the acid liquor, without the addition of oxide of zinc, on being evaporated, did not appear to produce in a very distinct manner the pellicle so characteristic of a solution of caseine. Bichromate of potash, iodate of potash, and ferro-cyanide of potassium, gave the usual precipitates in the acid solution, which may be obtained either with albumen or caseine.

A portion of the acid solution, on being mixed with a solution of chloride of ammonium, coagulated on being heated. A similar result was obtained with common salt, chloride of potassium, sulphate of soda, sulphate of potash, and nitrate of potash. The larger the quantity and the stronger the solution of the alkaline salt, the lower the temperature was at which the coagulation took place. The precipitates formed at very low temperatures were soluble in pure water; but the solutions were not coagulated by heat, though precipitable by ferro-cyanide of potassium. When recently thrown down and rapidly filtered, they dissolved in acetic acid. Strong alcohol also gave a precipitate in the original solution.

The distinctive tests for albumen are coagulation by heat, and, when a free acid is present, coagulation, on the addition of a salt with an alkaline base, the temperature of coagulation being less, according as the proportion of salt increases. So far, therefore, as these tests can be relied upon, it would appear that the caseine of the milk was converted into albumen in the presence of the lactic acid, formed from milk sugar, in the absence of air. If this was a simple metamorphosis, it would support the view that caseine was merely an albuminate of soda, so strongly held, among others, by M. Gerhardt. It is, however, very probable that the change is not so simple as this would make it: for how, in this case, was the lactic acid formed? A portion of the caseine must have first been modified into a lactic ferment, and

the remainder converted into albumen, according as the lactic acid was formed. A very small portion of the caseine would be sufficient to perform the function of ferment, so that the great mass might have been changed into albumen.

With a view to ascertain whether the relative quantity of albumen was in accordance with this view of the case, and also whether there remained any dissolved caseine, not converted into albumen, I added, as Lehman recommends, a strong solution of chloride of ammonium to the acid solution, and boiled for some minutes, so as to wholly coagulate the albumen; the boiled liquor was filtered, and a solution of sulphate of magnesia added, and again boiled: no precipitate was formed. It is usually considered that if, in such a case, caseine be present, it would be precipitated. But, although no substance having the properties usually attributed to caseine was present, the whole of the azotic matter was not precipitated by the addition of the alkaline salts. A considerable quantity of some other substance or substances remained in solution. Whatever this substance was, it putrefied very rapidly on exposure to the air, the liquor becoming, in two or three days, full of infusoriæ and fungi.

This easily putrescent substance may, however, have been formed after the metamorphosis of the caseine into albumen. But, on the other hand, it is stated that in the putrefaction of fibrine there is produced, among other things, a substance which, according to Strecker, has the composition, and all the characters, of albumen.¹ And, again, some chemists have been led to believe that caseine, as it is extracted from milk, is really a mixture of two different bodies. Schlossberger² digested well-washed caseine with dilute hydrochloric acid, and obtained a solution, which, on neutralization with carbonate of ammonia, gave a white, slimy body, which filtered with difficulty, while another body remained dissolved, and was precipitated by hydrochloric acid in excess. Schlossberger found that the first body contained sulphur, and the second not. But, even after the separation of the second body, another substance appeared to have been left behind. Gerhardt did not think the experiments of Schlossberger and others conclusive; undoubtedly it may with truth be objected, that the different substances just described were products of the decomposition of the true caseine resulting from the action of the hydrochloric acid. This objection does not apply with the same force to the following experiment of Mulder.³ Having freed milk as much as possible from blood globules, by the addition of common salt, he coagulated the milk with di-

¹ Gerhardt. *Chimie Organique*, t. iv. p. 462.

² *Annal. d. Chem. u. Pharm.*, lviii. s. 92.

³ Berzelius' *Jahresbericht*, Bd. 26.



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mists. According to one, first proposed by Berzelius, vinous fermentation is produced by the kind of action which he described as catalytic, and which he supposed to be the result of a peculiar force exerted by simple as well as compound bodies, whether in the solid or liquid condition, upon other substances with which they come in contact. The consequence of this action is, that a new arrangement of the molecules of the body acted upon takes place without the elements of the intervening body necessarily taking any part in the formation of the new substances. According to Faraday, catalytic action does not consist in the development of molecular force by mere contact, but rather in an electro-chemical action between the bodies included in the sphere of action.

Liebig, while adopting the fundamental idea that molecular motion may be transmitted to a quiescent body, so modified the previous view, that in his hands it became a large generalization, but differing in many respects from the hypothesis of Berzelius. According to Liebig, vinous fermentation may be looked upon as a species of putrefaction of a hydrate of carbon, or rather a metamorphosis, in which the elements of such a compound molecule arrange themselves under the action of their special affinities into new groups. This putrefaction is induced by contact with complex azotic bodies in which putrefaction commences spontaneously in the presence of water—non-azotized bodies not being capable of themselves to initiate the change. The azotized bodies which are best adapted to enter into this spontaneous motion of their constituent molecules, are vegetable albumen, gluten, and other similar bodies: putrefying animal matter of all kinds is capable of inducing the same kind of change, but much less perfectly than those named.

According to this view, Liebig considers yeast to be a substance whose elements exist in a condition of change, the ferment behaving in every respect as an azotic body in a state of putrefaction or decay. Yeast produces fermentation as a result of a progressive decomposition, which it suffers by contact with water and the oxygen of the air.

According to the second view, fermentation is a vegetative process, consisting in the growth of a plant at the expense of the fermenting bodies. This view, which appears to have been first suggested by Erxleben, was adopted by Cagniard de la Tour, Schwann, Kützing, Quevenne, Dumas, Mitscherlich, and Mulder.

There is this much in favour of the vegetative theory, that yeast is undoubtedly the mycellium of a fungus or mould (a *Penicillium*) in an abnormal condition. It consists of globules or free floating cells, without a trace of rootlets, which are capable of almost endless propagation, and which, from their submerged

position, are forced into a peculiar habit of development without ever producing perfect fruit.

Several observers, among others Hoffman and Berkeley, have followed up the development of individual yeast globules in fluid surrounded in a closed cell with a ring of air, and have obtained the true fruit proper to a *Penicillium*, and to one too which has been more than once observed to grow on fermenting matter.

It is also known that other species of mucor promote vinous fermentation as well as the true yeast plant; a case is recorded of the kind where a peculiar myceloid state of *Mucor clavatus*, was developed in raisin wine, the latter being, nevertheless, of peculiar excellence.⁵

But while there can now be no doubt that yeast is the mycelium of a fungus, there is still much room for difference of opinion as to whether the plant be the *primum movens* of the decomposition of the sugar, or only ancillary to it.

Pasteur has recently instituted a series of ingenious experiments, which have led him not only to adopt the plant theory, but to extend it to all other kinds of fermentation. He says, "that in the same manner as there exists in an alcoholic ferment, beer yeast, which is found wherever there is sugar, which breaks up into alcohol and carbonic acid, so there is a special ferment, a lactic ferment, always present when sugar becomes lactic acid, and that if every plastic azotized matter may transform sugar into that acid, it is because it is a suitable aliment for the development of that ferment". And further, "that there exist a great number of distinct ferments, all having their speciality of action".⁶

He describes the lactic yeast to be formed of globules, or rather threads somewhat swollen at the extremity, and about $\frac{1}{100}$ of a millimetre in diameter, and to be organized like beer yeast. It has been long known that carbonate of ammonia favours very much fermentation, but Pasteur has explained the reason, by showing that yeast can be rapidly formed in a solution of pure sugar if a salt of ammonia and phosphates be added. On trying the same experiment with lactic yeast, he produced a perfectly healthy lactic fermentation with a deposition of yeast globules.

In my paper, "On the presence of ammonia and nitric acid in the sap of plants",⁶ I dwelt upon the probability that plants derive the whole of their nitrogen from ammonia. There is nothing more natural, therefore, than that the yeast plant should be able to develop itself when provided with its proper food. But if

⁵ Mag. of Zool. and Bot. vol. 2, p. 34, quoted in Berkeley's Introduction to Cryptogamic Botany, p. 295.

⁶ Comptes rendus de l'Academie des Sciences, t. xlvi., No. 7 (Février, 1859), p. 337.

⁶ ATLANTIS, vol. i., p. 413, and Annales de l'Histoire Naturelle for February, 1859.

the single cell constituting the yeast plant be capable of assimilating ammonia and building up out of it albuminous bodies, is it likely that it would also possess the power of assimilating all the wide range of substances in all stages of alteration, which go by the name of albuminous bodies? The cell wall of all the ferment plants is cellulose, and yet one species produces vinegar, another alcohol and carbonic acid, and another lactic acid,—a difference of function which we can scarcely find between single cells even in the higher families of plants, where every cell may be said to enjoy a different chemical and physiological function. It seems more probable to suppose that azotic matter, in an active state, gives off ammonia (Schmidt showed that ammonia existed in fermenting liquors), and that as the spores of fungi abound everywhere, they at once grow and multiply, wherever the ammonia is thus given off, because there their proper supply of food exists. We know that even the diffusion of a solution of a salt into pure water is enough to produce a certain amount of decomposition: how much more so must this be the case during the exosmosis and endosmosis of complex, and therefore unstable, substances already in a state of activity, through the cellulose membrane of the yeast cells. The *primum movens* may, therefore, be, as Liebig supposes, an azotic body in a state of change, the yeast cells growing upon the products of decomposition, and therefore removing them from the field, while the flow of liquids through the cell presents greater facilities for decomposition by molecular action. According to this view, vegetation is not the *primum movens*, but the consequence, of fermentation.

Pasteur states that the origin of the lactic fermentation in the experiments which he made, was solely due to atmospheric air. In the case of the milk examined by me, air could not have assisted, as it was wholly excluded. It may, no doubt, be objected that the milk contained some air when it was introduced into the bottle. I grant it, but why did the lactic fermentation not set in at the usual time, and not after a considerable period, during which the whole of the oxygen must have been slowly used in oxydizing the caseine? Then, again, no trace of yeast globules could be found in the milk when the bottle was opened; but, after a few days, abundance of infusoriæ were developed in the liquid, partially neutralized by zinc.

The formation of the lactic acid under the circumstances which I have described, does not admit, as I believe, of being explained according to the hypothesis of M. Pasteur. I am therefore desirous of calling his attention to the fact.



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From the Royal Academy of Sciences, Prague.

5. Abhandlungen der Königlichen Böhmisches Gesellschaft der Wissenschaften von den Jahren 1854–1856.

6. Systematisches Verzeichniss der Böhmisches Trilobiten von Dr. W. R. Weitenweiber. *Prague.*

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BELGIUM.

From the Royal Academy of Sciences, Brussels.

7. Bulletin de l'Académie Royale des Sciences des Lettres et des Beaux-Arts de Belgique. Nos. 6, 8, 9, and 10 (No. 7 not received).

From the Royal Academy of Medicine, Brussels.

8. Bulletin de l'Académie Royale de Médecine de Belgique. Nos. 8, 9, and 10, completing the vol. for 1857–1858.

From the Editors.

9. Journal de Médecine de Chirurgie et de Pharmacologie Publié par la Société des Sciences Médicales et Naturelles de Bruxelles. Nos. for July, August, September, November, and December (numbers for January, February, April, and October not received).

10. Revue de l'Instruction Publique en Belgique, *Bruges.* Vol. for 1858, complete.

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DENMARK.

From the Royal Academy of Sciences, Copenhagen.

11. Oversigt over det Kongelige danske Videnskabernes Selskabs, Forhandlingar og dets Medlemmers Arbejder i Aaret, 1857.

From Royal Society of Northern Antiquaries, Copenhagen.

12. Mémoires de la Société Royale des Antiquaires du Nord, 1845, 1849.

13. Cabinet d'Antiquités Américaines a Copenhague Rapport Ethnographique, par C. C. Rafn (1858).

14. Sur la Construction des Salles dites des Géants, par S. M. Le Roi Frédéric VII. de Danemark (1857).

15. Saga Játvardar Konungs Hins Helga (1852).

16. Antiquités de l'Orient Monuments Runographiques interprétés, par C. C. Rafn (1856).

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ENGLAND.

17. Journal of the Statistical Society of London. Vol. xxi., Parts 3 and 4. *From the Society.*

18. Proceedings of the Royal Institution of Great Britain. From April to July, 1858. *From the Council.*

19. Journal of the Society of Arts. Regularly. *From the Society.*

20. Memoirs of the Literary and Philosophical Society of Manchester. Vol. xiv. 2nd series. *From the Society.*

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FRANCE.

From the Imperial Zoological Society of Acclimatation.

21. Bulletin mensuel de la Société Impériale Zoologique d'Acclimatation. T. v. Nos. 6, 7, 8, 9, 10, 11; Liste Générale des Membres de la Société, etc.

From the Imperial Agricultural Society of France.

22. Bulletin des Séances, Compte rendu mensuel rédigé, par M. Payen (de l'Institut), Secrétaire Perpetuel. T. xiii. 2^{me}. Série, Nos. 1, 2, 3, 4, 5.

From the Academy of Lyons.

23. Mémoires de l'Académie Impériale des Sciences, Belles-Lettres, et Arts de Lyon: Classe des Lettres—Nouvelle Série, Vol. 3, 4, 5, 6; Classe des Sciences, Vol. 2, 3, 4, 5, 6.

From the Agricultural Society of Lyons.

24. Annales des Sciences Physiques et Naturelles d'Agriculture et d'Industrie. 2^{me}. Série. Vol. viii. (1856); 3^{me}. Série, Vol. i. (1857).

From the Linnean Society of Lyons.

25. Annales de la Société Linnéenne de Lyon. Nouvelle Série, Vol. iii. iv. (1856, 1857).

From the Editors.

26. Revue Générale de l'Architecture et des Travaux Publics. Journal des Architectes, des Archéologues, des Ingénieurs, et des Entrepreneurs. Publié sous la direction de M. César Daly. 19^{me}. année, 16 Vol. Nos. 1, 2, 3, 4, 5, 6.

27. Journal de l'Agriculture Pratique. Publié sous la direction de M. J. A. Barral. Nouvelle période. Tome 1^{er}. 1, 2, 7, 10 (completing the volume); T. ii. 13, 15, 18, 19, 20, 21, 22, 23 (wanting 14, 16, 17).

28. Cosmos. Rédigée par M. l'Abbe Moigno. 13^{me}. Vol. Nos. 7 to 25 (wants 1 to 6 inclusive, to complete series).

29. Nouvelles Annales de Mathématiques (wanting only the Number for October to complete the year).

30. Annales de Philosophie Chrétienne; iv^{me}. série. T. xviii., Nos. for September and October.

HESSE DARMSTADT.

From the Editors.

31. Annalen der Chemie und Pharmacie. Hersg. von F. Wöhler, J. Liebig, u. H. Kopp. Nos. 4, 5, 6, 7, 8, for 1858 (No. 3 for March not received).

LOMBARDO-VENETIAN KINGDOM.

From the Editor.

32. Annali di Chimica applicata Alla Medicina. Compilati dal Dot. G. Polli. Vol. xxvii. della serie 3^a. 1, 2, 3, 4, 5.

MODENA.

33. Il Distributore. Regularly. *From the Editor.*

PONTIFICAL STATES.

From the Editors.

34. La Civiltà Cattolica. Nos. cxcviii. to ccvii. inclusive.

PRUSSIA.

From the Geological Society of Germany

35. Zeitschrift der Deutschen Geologischen Gesellschaft. Bd. ix., 4 Heft. Bd. x., 1 Heft.

From the Society of Naturalists of Dantzig.

36. Neueste Schriften der Naturforschenden Gesellschaft in Dantzig:

1 ^{ste} Bd.	3, 4, Heften	(1824-1825).
2	" 2, 3, 4, "	(1827-1831).
3	" 1, 2, 3, 4, "	(1835-1842).
4	" 1, 2, 3, 4, "	(1843-1851).
5	" 1, 2, 3, 4, "	(1853-1856).
6	" 1, "	(1858).

From the Editor.

37. Archiv für Pathologische Anatomie und für Klinische Medicin. Hersg. von R. Virchow, 14^{ten}. Bd. 1, 2, Heften.

NAPLES AND SICILY.

From the Academy of Catania.

38. Giornale del Gabinetto Letterario dell' Accademia Gioenia. Vol. 4^o. Fascicolo.

39. Discorso e descrizione per la Solenne Cerimonia nel porsi la prima pietra alla fondazione del R. Orto Botanico in Catania.

BOOKS, PAMPHLETS, ETC.

40. Etude de la Langue Etrusque, par le R. P. Tarquini.

41. Observations on Diphtheritis. By Willoughby Wade, B.A., M.B., T.C.D., Physician to the General Dispensary, Birmingham.



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BAVARIA.

From the Royal Academy of Munich.

11. Gelehrte Anzeigen, herausgegeben von Mitgliedern der königl. bayer. Akademie der Wissenschaften. Vols. 45, 46, and 47.

From Professor Lamont, Director of the Royal Observatory of Munich.

12. Astronomische Beobachtungen angestellt auf der königl. Sternwarte zu Bogenhausen bei München von J. Soldner. Bds. i., ii., iii., iv., v., enthaltend die Beobachtungen von 1820–1827.

Observaciones Astronomicæ in Specula regia monachiensi institutæ, et Regio jussu publicis impensis editæ a J. Lamont. Vol. vi., vii., viii., ix., x., xi., xii., xiii., xiv., xv. Seu novæ sereiei. Vol. i., ii., iii., iv., v., vi., vii., viii., ix., x. Observationes annis, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, et 1844, factas continens. (The two series form a complete collection in 15 volumes).

13. Annalen der königlichen Sternwarte bei München. Vol. i. to x., from 1848 to 1858 (being the continuation of the Observaciones Astronomicæ, and also of the Annalen für Meteorologie und Erdmagnetismus).

14. Annalen für Meteorologie und Erdmagnetismus. Heft. 1–12. 1842 to 1854.

15. Jahresbericht der münchener Sternwarte für 1852 und 1854.

16. Astronomischer Kalender für das Königreich Bayern auf das gemeine Jahr, 1850. Do., 1851; do., 1852; do., 1853. *München.*

17. Resultate des Magnetischen Observatoriums in München während der dreijährigen Periode, 1843–1845. Von Dr. J. Lamont. *München, 1846.*

18. Bestimmung der horizontal Intensität des Erdmagnetismus nach absolutem Maasse. Von Dr. J. Lamont. *München, 1842.*

19. Magnetische Ortsbestimmungen an verschiedenen Punkten des Königreichs Bayern und an einigen auswärtigen Stationen.

I. Theil—mit 18 lithographirten Tafeln
II. „ „ 26 „ „
Beilage—Lamont's Magnetische Karten von Deutschland und Bayern.

20. Untersuchungen über die Richtung und Stärke des Erdmagnetismus an verschiedenen Punkten des Südwest-

lichen Europa im allerhöchsten Auftrage seiner Majestät des Königs Maximilian II. von Bayern. Ausgeführt von Dr. J. Lamont, Professor an der Ludwig—Maximilian's Universität und Conservator der königlichen Sternwarte. *München, 1858.*

21. Beobachtungen des meteorologischen Observatoriums auf dem Hohenpeissenberg von 1792–1850.

Meteorologische Beobachtungen aufgezeichnet an der königl. Sternwarte bei München in den Jahren, 1825–1837. Erster und Zweiter Supplement Bände zu den Annalen der münchener Sternwarte.

22. Verzeichniss der vorzüglichsten im Königreiche Bayern gemessenen Höhenpunkte nebst den geographischen Positionen der grösseren Städte, etc., von Dr. J. Lamont. 2te vermehrte und verbesserte Auflage.

23. Beschreibung der an der münchener Sternwarte zu den Beobachtungen verwendeten neuen Instrumente und Apparate. Von Dr. J. Lamont. *München, 1851*

24. Nebula Orionis ex Observationibus in Specula Monachiensi institutis a J. Lamont.

25. Stellarum Acervus in Clypeo Sobieskii ex Observationibus in Specula Monachiensi institutis a J. Lamont.

From the Author.

26. Sawitri, eine Indische Dichtung aus dem Sanskrit übersetzt von Joseph Merkel, Professor und Hofbibliothekar *Aschaffenburg.*

27. Des Marcus Manilius Himmelskugel. Lateinisch und deutsch übersetzt im Versmasse des Originals. Von Dr. Merkel, etc.

28. M. A. Lucanus Pharsalia,—1^{ster} Buch lateinisch und deutsch übersetzt im Versmasse des Originals. Von Dr. Merkel, etc.

BOHEMIA.

From the Authors.

29. Glagolitische Fragmente, Herausgegeben von Dr. Karl Adolph Constantin Höfler, k. k. Universitäts—Professor, und Dr. Paul Joseph Sáfárik, k. k. Universitäts-Bibliothekar.

(Aus den Abhandl. der k. böhm. Gesch. d. Wissen. V. Folge 10 Bd. Prag. 1857.)

ENGLAND.

From the Literary and Philosophical Society of Manchester.

30. Memoirs of the Literary and Philosophical Society of Manchester. Vol. xv., p. 1. Proceedings of the Society from October 6th, 1857, to April 20th, 1858.

From the Statistical Society of London.

31. Journal of the Statistical Society of London. Vol. xxii., parts 1 and 2 for March and June, 1859.

From the Society of Arts, London.

32. Journal of the Society of Arts. Regularly received.

From the Geological Society of London.

33. Abstracts of the Proceedings of the Geological Society of London. Regularly received.

FRANCE.

From the Imperial Zoological Society of Acclimatation, Paris.

34. Bulletin mensuel de la Société Impériale Zoologique d'Acclimatation. T. v. No. 12. T. vi. Nos. 1, 2, 3, 4, 5.

From the Imperial Academy of Dijon.

35. Mémoires de l'Académie Impériale des Sciences, Arts, et Belles-Lettres de Dijon, 2^{me}. Série. Tom. 1, 2, 3, 4, 5, 6. for the years 1851 to 1857, with an Atlas—Description d'un nouveau genre d'E'dente fossile, renfermant plusieurs espèces voisines du Glyptodon. Illustrative of a memoir of M. L. Nodot.

From the Editors.

36. Revue Générale de l'Architecture et des Travaux Publics. Journal des Architectes, des Archéologues, des Ingénieurs, et des Entrepreneurs. Publié sous la direction de M. César Daly, 19^{me}. année, 16 Vol. Nos. 7, 8, 9, 10, 11, 12. (Completing the volume.)

37. Journal de l'Agriculture Pratique. Publié sous la direction de M. J. A. Barral. Année, 1859. Tom. i., Nos. 2, 3, 4, 5, 6, 7, 8, 9.

38. Cosmos. Rédigée par M. l'Abbe Moigno. Vol. xiii., No. 26. Vol. xiv., No. 1 to 24.

39. Nouvelles Annales de Mathématiques. No. for October, 1858. Completing volume for that year.

40. Annales de Philosophie Chrétienne; iv^{me}. série. T. xviii., Nos. 107, 108. Tom. xix., 109, 110, 111.

HESSE DARMSTADT.

From the Editors.

41. Annalen der Chemie und Pharmacie. Hrsg. von F. Wöhler, J. Liebig, u. H. Kopp. Nos. 9, 10, 11, 12, for 1858.

LOMBARDO-VENETIAN KINGDOM.

From the Institute of Venice.

42. Atto dell' imp. reg. Istituto Veneto di Scienze, Lettere ed Arti, dal November, 1858, all' Ottobre, 1859. Tome Quarto Serie Terza; Dispense 1^o, 2^o, 3^o, 4^o, 5^o, 6^o.

From the Editor.

43. Annali di Chimica applicata alla Medicina. Nol. xxvii., fasc. 6.

NAPLES AND SICILY.

From the Academy of Catania.

44. Giornale del Gabinetto Letterario dell' Accademia Gioenia. Vol. 4^o. Fasc. 1 and 2.

PONTIFICAL STATES.

45. La Civiltà Cattolica. ccviii., ccix., ccx. Serie iv., vol. i., Quaderni, 216, 217, 218, 219, 220, 221, 222.

PRUSSIA.

From the Geological Society of Germany

46. Zeitschrift der deutschen geologischen Gesellschaft. Bd. x. H. 2, 3.

From the Archæological Society of Berlin.

47. Ueber die Anthesterien und das Verhältniss des attischen Dionysos zum Koradienst. Von Hrn. Gerhard.

(Gelesen in der Akademie der Wissenschaften am 1ten. Juli, 1858.)

48. Das Grab des Dionysos an der Marmorbasis zu Dresden—Achtzehntes Programm zum Winckelmannsfest der Archäologischen Gesellschaft zu Berlin. Von Carl Bötticher.

From the Editor.

49. Archiv für Pathologische Anatomie und für Klinische Medicin. Hrsg. von R. Virchow,
14^{ten}. Bd. H. 3-4, 5-6 (completing volume).
15^{ten}. Bd. H. 1-2, 3-4, 5-6 (completing volume.)

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RUSSIA.

From the Esthonian Literary Society at Dorpat.

50. Verhandlungen der gelehrten estnischen Gesellschaft zu Dorpat. 3^{ter}. Band. 1st. Heft. 4^{ter}. Band. 1^{ter}. u. 2^{ter}. Heften.

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SWITZERLAND.

From the Swiss Association of Science.

51. Verhandlungen der Allgemeinen

Schweizerischen Gesellschaft für die gesammten Naturwissenschaften bei ihrer Versammlung in Trogen am 17, 18, und 19 August, 1857.

From La Société Vaudoise des Sciences Naturelles, Lausanne.

52. Bulletin de la Société Vaudoise des Sciences Naturelles. T. vi., No. 43. Catalogue de la Bibliothèque, Lausanne, 1858.

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MISCELLANEOUS BOOKS, PAMPHLETS, ETC.

From the Authors.

53. A Paper on the Subject of Burns' Pistols, read at a meeting of the Society of Scottish Antiquaries, on Tuesday, 19th April, 1859. By the Right Rev. Bishop Gillis. *Edinburgh.*

54. Canadian Ballads and Occasional Verses. By Thomas D'Arcy McGee, M.P.P. *Montreal, John Lovell, 1858.*

55. The Mutinies and the People, or Statements of Native Fidelity, exhibited during the Outbreak of 1857-1858. By a Hindu. *Calcutta, 1859.*