PARIS
UNIVERSAL EXHIBITION
OF 1878.

HANDBOOK

TO THE

BRITISH INDIAN SECTION.

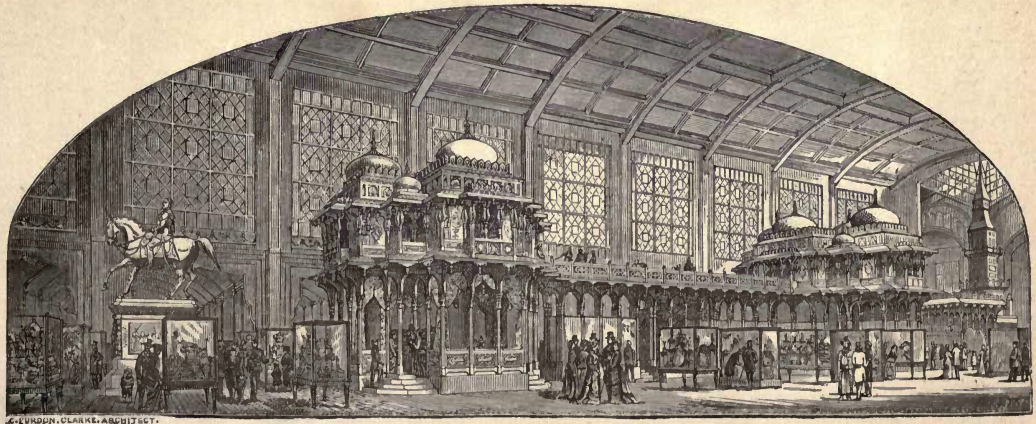
BY

GEORGE C. M. BIRDWOOD, C.S.I., M.D. EDIN.

(SECOND EDITION.)

OFFICES
OF THE ROYAL COMMISSION:

LONDON:	PARIS:
CANADA BUILDINGS, KING-ST., WESTMINSTER.	40, AVENUE DE SUFFREN, CHAMP DE MARS.



THE INDIAN COURT, PARIS EXHIBITION, 1878.

PARIS
UNIVERSAL EXHIBITION
OF 1878.

HANDBOOK

TO THE

BRITISH INDIAN SECTION.

BY

GEORGE C. M. BIRDWOOD, C.S.I., M.D. EDIN.

(SECOND EDITION.)

OFFICES
OF THE ROYAL COMMISSION:

LONDON:	PARIS:
CANADA BUILDINGS, KING-ST., WESTMINSTER.	40, AVENUE DE SUFFREN, CHAMP DE MARS.

Price One Shilling.

PARIS UNIVERSAL EXHIBITION, 1878.

BRITISH COMMISSION.

PRESIDENT:

H.R.H. THE PRINCE OF WALES, K.G., G.C.S.I.

BRITISH INDIAN SECTION.

COMMITTEE OF HER MAJESTY'S COMMISSIONERS
APPOINTED BY
HIS ROYAL HIGHNESS THE PRESIDENT
15 JANUARY 1877.

THE EARL OF NORTHBROOK, G.C.S.I., CHAIRMAN.
GEN. SIR A. H. HORSFORD, G.C.B.
MAJOR-GEN. SIR HENRY RAWLINSON, K.C.B.
SIR RUTHERFORD ALCOCK, K.C.B.
SIR LOUIS MALLET, K.C.B.
COLONEL ELLIS, C.S.I.

EXECUTIVE.
THE SECRETARY OF THE ROYAL COMMISSION.

OFFICIAL COMMERCIAL AGENT.
C. PURDON CLARKE.

CLERK IN CHARGE OF HIS ROYAL HIGHNESS' COLLECTION.
J. MANSEL BRETT.

SCIENTIFIC COLLECTION OF RAW PRODUCTS SPECIALLY ORDERED BY THE GOVERNMENT OF INDIA.
ARRANGED BY P. L. SIMMONDS.

WOOD SPECIMENS AND FOREST PRODUCTS
ARRANGED BY COLONEL GEORGE PEARSON, R.E.

SPECIMENS OF TUSSER SILK AND NATIVE DYE STUFFS,
ARRANGED BY THOMAS WARDLE, LEEK, STAFFORDSHIRE.

PREFACE.

EARLY in 1877 His Royal Highness, as President of the Royal Commission, communicated to the Secretary of State for India the proposed arrangements for the forthcoming Exhibition at Paris, at the same time offering to lend the valuable collection of presents, then lodged at the Bethnal Green Museum, which had been made to His Royal Highness by the Princes and Chiefs of India.

The question of the part which should be borne by India in the proposed Exhibition had already been under the consideration of the Council of India, owing to communications made by the French Ambassador to the Secretary of State for Foreign Affairs, and it had been decided that the advantage to India did not (more especially at a time when there was unusual pressure on the finances of the country) justify so large an expenditure from Indian revenues as had been incurred on former exhibitions; and it was considered sufficient that contributions of Indian articles should only be made somewhat on the scale adopted in the recent instance of the Philadelphia Exhibition, when a selection of raw products and manufactures was entrusted to the care of the Commissioner representing the British Government.

As the collection so liberally offered by His Royal Highness would in the opinion of the Council more than sufficiently represent the higher Art manufactures of India, it was considered necessary on the part of the Indian Government to contribute only a scientific collection of the raw products of the country.

The Committee therefore determined to invite the co-operation of such leading importers as were in a position to illustrate the principal Art manufactures of India.

There remained to represent those articles of Native production, which, though low in intrinsic worth, were as standards of art industry of great interest. Some classes of these Native productions were fully represented in private collections offered by their possessors to the Committee (the peasant jewelry of Mrs. Rivett Carnac, over 6,000 objects, a remarkable instance), and only supplementary collections of ordinary pottery, metal work, chintz printing, &c., had to be made to complete a fairly perfect display of the principal products of the Indian Empire.

To obtain these specimens from the different localities His

Royal Highness the President, through the courtesy of the Marquis of Salisbury, wrote officially to India inviting the assistance of Lord Lytton, Viceroy and Governor-General of India; the Duke of Buckingham and Chandos, Governor of Madras; Sir Richard Temple, Governor of Bombay; Sir George Couper, Lieutenant-Governor of the North-Western Provinces; Mr. Egerton, Lieutenant-Governor of the Punjab; and Mr. Rivers Thompson, Chief Commissioner of British Burma, asking them to direct the expenditure of several small sums of money to be furnished by the Committee upon such objects as were noted to them.

The selection thus made consisted of:—

Bombay and Sind pottery.
Madras pottery.
Punjab pottery and metal work.
Azimghur pottery.
Tanjore and Madura metal work.
Masulipatam chintzes.
Benares brasswork.
Burmese wood carvings and tin articles.
Lucknow muslins.

Towards the end of 1877 these objects began to arrive, and with them certain Jeypore vases of remarkable size, and the carved Burmese door from the Government House at Calcutta, lent by the Viceroy.

The Maharajah of Kashmir then notified his desire to contribute to the collections; also the Maharajah of Oodeypore, the Maharajah of Patiala, the Rajah of Jind, and the Rajah of Nabha.

The prospect of the Indian collections assuming a scale larger than at first contemplated in the arrangement made by the Committee, induced His Royal Highness, the President, to personally ask the French authorities for a not less important position than the western half of the grand transept or vestibule; this being granted, the Indian section obtained the post of honour among the foreign departments in the Exhibition of 1878.

C. Purdon Clarke.

BRITISH INDIAN SECTION.

The various objects exhibited in the Grand Vestibule of the Palace of the Champ de Mars, number over twelve thousand specimens arranged into the following collections:—

1. The Indian presents belonging to his Royal Highness the Prince of Wales, and other private collections lent to the Indian Committee.
2. Articles of Indian manufacture exhibited by the principal importing firms in London and Paris, exhibited in the Indian Pavilion.
3. Supplementary collection of native art manufacture exhibited by the Indian Committee (objects priced for sale at the close of the exhibition).
4. Raw products, and food substances, woods and forest specimens, dyes, &c.

LIST OF EXHIBITORS.

Art Loan Collections.

HER MAJESTY THE QUEEN.
THE PRINCE OF WALES, K.G.
Earl of Northbrook, G.C.S.I.
Lady Emma Baring.
Colonel Earle, C.S.I.
Mrs. Rivett Carnac.
A. Haliburton, Esq.
C. C. Prinsep, Esq.
Colonel J. Michael, C.S.I.
Gerald S. V. Fitzgerald, Esq.

Commercial Collections.

Exhibited by

The Maharajah of Kashmir.
The Maharajah of Patiala.
The Maharajah of Oodeypore.
The Rajah of Jind.
The Rajah Nabha.
G. Terry, School of Art, Bombay.
H. Kipling, School of Art, Lahore.
Vincent Robinson & Co., 34, Wigmore Street, London.
Farmer and Rogers, 171, 173, 175, and 117, 119, Regent Street, London.
Watson and Bontor, 35, 36, Old Bond Street, London.
J. Watson and Son, Moorgate Street Chambers, London, E.C.

Messrs. Deschamps & Co., Madras.
George Holme, Bradford.
Verdé Delisle, 80, Rue Richelieu, Paris.
Les Fils Oulman & Cie, 2, Rue Drouot, Paris.
Normand et Chandon, 82, Rue Richelieu.
Dalseme, Rue St. Marc, 21.
Shoene, Kilburn & Co., Jubbulpore School of Industry.

Raw Products; Food, &c.

Thomas Wardle, Leek, Staffordshire.—Dyed and Tusser Silk.
Indian Tea Agency.—Teas. A. Burrell, Secretary, 2, Jermyn Street.
Henry Berners and R. V. Doyne, Proprietors of the Amgoorie Tea Estate, Sibsagor, Assam.—Tea.
Darjeeling Tea Estate.—Tea.
Kousanie Tea Company.—Tea.
Assam Company.—Tea.
Gowhatty Tea Company.—Tea.
Doom Dooma Garden.—Tea.
Messrs. Rajeeb, Paul & Co.—Tea.
Economic Museum, Calcutta.—Tea.
Eastern Cachar Tea Company.—Tea.
Colonial Tea Company, Assam.—Tea.
Manockj-Poonjidji & Sons.—Pickles and Preserves.
Rustumji-Bikhaji & Sons.—Pickles and Preserves.
S. F. Wyeed, Kurrachee.—Pickles and Preserves.
Tramji Nouroji.—Pickles and Preserves.
Newson & Co., Calcutta and London.—Pickles.
Murree Beer Company.—Bottled Beer.
Minchin Brothers, Aska, Madras.—Sugar and Spirits.
C. Foster & Co.—Bookbinding and Printing.
Mahomed Hussein Sahib.—Embroidery.
Oraganti Tirnpetty Raju.—Triplicane Embroidery.

TABLE OF CONTENTS.

VANITAS EST PRAESENTEM VITAM SOLUM ATTENDERE : * * * QUIA NON SATIATUR OCULUS VISU, NEC AURIS IMPLETUR AUDITU. VANITAS EST DILIGERE QUOD CUM OMNI CELERITATE TRANSIT, ET ILLUC NON FESTINARE, UBI SEMPITERNUM GAUDIUM MANET.

De Imitatione Christi.

HANDBOOK TO THE INDIAN COURT,

PARIS UNIVERSAL EXHIBITION,

1878.

INTRODUCTION.

The Indo-Germanic shore, or litus Arianum.

A COMPARISON has often been drawn between the outlines and the civilisations of the three continents of Europe, Asia, and Africa. The continent of Africa, the first peopled of the three, presents the most uniform outline, as it does the most monotonous surface. Its coast line is almost unbroken by gulfs and bays, or even by any considerable river estuary or other inlet of the sea affording access to the interior, and, shut up within its harbourless, unapproachable mass from the rest of the world, its tribes and nations still remain in their primitive state of savagery, or have advanced only to barbarism. Europe is penetrated in every direction by prolonged bays, gulfs, and inland seas; separating it into distinct and very diverse natural regions, all in easy communication with each other and with the numerous islands surrounding the coast, continuations of the netted mountain chains the upheaval of which determined the complicated, or, as it might be expressed, highly elaborated figure of this continent; which, although the latest peopled of the three, is the most advanced in civilisation. The coast line of Asia is scarcely less varied, but its peninsulas and gulfs are on so large a scale as almost to form continents and oceans in themselves. Indeed the mountain systems of Europe culminate in the stupendous plateau of Central Asia, and Europe is really but the greatest peninsula of Asia. Burma, Siam, and Anam are more than seven times the area of Turkey in Europe and Greece; India is fourteen times the area of Italy, and Arabia is more than five times the area of Spain and Portugal. India is as large as Europe, exclusive of Russia, and the whole continent of Asia is larger than Europe and Africa put together. Upheaved in such colossal proportions, whatever advantages of communication it offers along the shores of

its boundless seas, internally it presents, in its dull, tame, and inhospitable distances, and impassable, icy heights, even greater obstructions to human intercourse than inner Africa; and though the civilisation of Asia is far before that of Africa, it has never advanced beyond its semi-civilised as distinguished from its barbarous stage, while Central Asia still remains barbarous, and in some regions almost savage; its inaccessibility having given rise to the mediæval legend of the Shut-up Nations.

It is a remarkable coincidence that Europe should repeat on a smaller scale the main features of the coast line of Asia. The peninsula of Arabia is repeated in the Iberian peninsula; Asia Minor and Persia in France; India in Italy; Burma, Siam, Anam, and the Eastern Archipelago in Turkey, Greece, and the Grecian Archipelago; and the Chinese Empire in Russia; while Japan is placed on the east of the Euro-Asian continent symmetrically with the British Isles on the west. The parallelism between India and Italy is very striking; the Himalayas are repeated in the Alps; the Indus and Ganges in the Rhone and the Po; Karachi is Genoa or Marseilles; Calcutta, Venice; Delhi, Milan; Bombay, Naples; Ceylon, Sicily; and the Laccadive and Maldive Islands are the mountain peaks of a submerged Corsica and Sardinia.

If we indeed forget for a moment the arbitrary, although convenient, division of Europe and Asia into two continents, and view them as one, we shall not fail to observe the manner in which its elaborately broken coast line stretches obliquely from the British Isles, in the temperate zone, gradually southward through a distance, as the crow flies, of from 8,000 to 9,000 miles, until it ends in the Eastern Archipelago, under the Equator, thus inviting the nations along its entire length to mutual commerce, not simply by the facilities it gives them for intercommunication, but also by the infinite variety in the productions of the temperate and tropical zones, which passed on from country to country, they have to offer one another. Once settled by the human race, it was inevitable that a great commerce, with its perennial sources in the fertility of the Eastern Archipelago,—"the world's green end" of Homer's "blameless Æthiopians,"—should spring up everywhere along this remarkable coast line. The renown of the riches of the trade in spices and other aromatics with the islands of the Eastern Archipelago was propagated all over Asia and Europe in the Legends of the Land of Gold, and the geographical and other myths of fable and folk-lore are the vague, broken traditions of an immemorial trade, in its prehistoric beginnings, pursued along these shores of old romance. For centuries this commerce was carried on, not directly between one country and another, but through innumerable intermediate agencies, so that distant countries knew each other only by their productions and the strange "travellers' tales," which grew in wonder as they were passed from mouth to mouth between the East and the West. The very name of India remained unknown among the nations of the Mediterranean Sea for centuries after its costly perfumes had been in daily use in the service of the Jews'

Tabernacle at Shiloh and Jerusalem, and earlier still for embalming the dead in Egypt.

The southern coast line of Europe and Asia is interrupted between the Mediterranean and Red Sea by the Isthmus of Suez, and as, from this point, the peninsula of Arabia extends for about 1,500 miles southwards into the Arabian Sea, the Isthmus of Suez really presents the length and breadth of Arabia as an obstruction to the direct course of the trade between the Mediterranean and Indian Ocean. As it is twice as long from Suez to Aden as from the Mediterranean to the head of the Persian Gulf, the commercial advantages of the Red Sea route, even after the discovery of sailing to India by the monsoons, have always been nearly equalled by the comparative shortness of the route by the Persian Gulf and Euphrates Valley. From time immemorial these two lines have competed on almost equal terms for the commerce of India, and the competition between them is the true key to the history of the successive states and empires which rose and fell along their course; rose as they gained the trade of India; fell when they lost it. So great an obstruction was the Isthmus of Suez found to be, that the rulers of Egypt twice or thrice endeavoured to cut a canal between the Red Sea and the Nile, while, in the hope of avoiding the circumnavigation of Arabia, the daring attempt was successfully made to circumnavigate the continent of Africa itself.

So important are the positions in connexion with the Red Sea and Persian Gulf routes, that not only was there always a rivalry between the nations on the Persian Gulf and those on the Red Sea, but it was a vital question among the latter whether the Indian trade should go by the Gulf of Akaba or the Gulf of Suez. The rivalry between Assyria and Egypt, and Assyria and Phœnicia, and between Jerusalem and Tyre on the one hand, and Jerusalem and Petra on the other, which finds such startling expression in the prophetic denunciations and lamentations of Isaiah, Jeremiah, and Ezekiel, had largely for its origin the competition for the monopoly, or at least a share, of the riches of the commerce of India and the Eastern Archipelago. The overwhelming vantage ground of the Semitic races, and, particularly, of the Arabians and Phœnicians [for the Hebrews were somewhat unfortunately placed between the Idumæans and the Phœnicians], was that, from the dawn of history, they were already in possession of all the lands separating the Mediterranean from the Red Sea, the Persian Gulf and Indian Ocean. This gave them their start in the civilisation of the world. The Phœnicians in the Mediterranean, and the Arabians in the Red Sea, Persian Gulf, and Indian Ocean, at once engrossed in their own hands the whole of the trade between the Mediterranean countries and Southern Asia, the Arabs keeping it without interruption until Da Gama opened up the route to India by the Cape of Good Hope. Ultimately the Phœnicians and their colonies were forced to succumb to the rivalry of Assyria, Greece, and Rome; yet Tyre was not finally destroyed till taken by the Crusaders, who would appear to have been often

strongly influenced by commercial motives, or were at least ever ready to advance the commercial interests of the mediæval Italian States in the 12th century. During the 300 years subsequent to Da Gama's successful enterprise the Red Sea and Persian Gulf routes gradually fell into disuse, but now are regaining their former importance; and to secure them against all danger, as the future highways of the rapidly increasing commerce of Europe and America, with Asia and Australasia, has become one of the highest political duties of our age. Commerce always sets steadily towards the shortest routes, and under the pressure of the competition of modern Europe for the commerce of the East, the Euphrates Valley, which is the shortest road between the Mediterranean and Persia and India, will, within another generation, become the chief commercial road between these countries and the West. Commercial supremacy, the only sure foundation of political supremacy, is absolutely dependent on the opportunity of roads and markets, on strategical points and communications, as military men call them. Indeed war is only another form of commercial rivalry, seeking by violence the same advantages which commerce often far more surely wins by its slower, deadlier sap. It was of comparatively little consequence that the Egyptian government and the Medo-Babylonian monarchy were overthrown, or that ancient Tyre was twice razed to the ground, for, while the commerce of India still went by the Red Sea and Euphrates Valley, the people prospered; but when the Portuguese outflanked these routes by doubling the Cape, Egypt became "a base kingdom," and Babylon "a refuge for the wild beasts of the desert," and Tyre "a place to spread nets upon." If

> "Peace hath her victories
> No less renown'd than war,"

its defeats also are more terrible and crushing, and far more enduring in their disastrous results. The discovery of Da Gama made the whole of Western Asia a desert, and impoverished all the countries of the Mediterranean for nearly three centuries.

The Settlement of the Old World by the Human Race.

The early civilisation of the world was thus developed along the course of the Indian trade, which grew up in consequence of the facilities the coast-line of Southern Europe and Asia presents for intercommunication, and the direct inducements to commerce offered by the prodigal diversity of the natural productions to be found along it. The earliest civilisations arose in those countries—Arabia, Egypt, Chaldæa, Assyria, Babylonia and Phœnicia—which are situated about the point where it is interrupted by the Isthmus of Suez, the inhabitants of which naturally became the land-transit agents of a trade, of which the Arabians and Phœnicians were at last the general sea carriers. Science is only now beginning to conjecture whence and how these countries were peopled by the human race. We know only that, when the Aryan races first began, between B.C.

3000–2000, their westward migrations from their primeval home in High Asia, there were yellow Turanian races everywhere behind them and on their right, and black Turanian races everywhere on their left, and that the Semitic race was already in possession of the mountains of Kurdistan and Armenia, and settled in Mesopotamia, Syria, Canaan, and Arabia. Few now pretend to doubt the common origin of mankind ; and the genealogies of Genesis are recognised to be in the strictest accordance with the results of the latest ethnological science. They present indeed a real geographical picture of the world as it was known to the Hebrews during the period between their bondage in Egypt and the Captivity. If therefore we broadly accept the Bible account of the creation of man, and take into consideration the present localisation of races on the globe, and the fact that the distribution of land and water on its surface is constantly changing, and that nowhere in the known continents of the world do we find a truly aboriginal, autochthonous race, we shall have little difficulty in also accepting the hypothesis that the human race first appeared on a continent, named Lemuria by Sclater, since sunk somewhere in the Indian Ocean, which once united Africa to Southern India and the Malayan peninsula, and from which it is quite possible the whole world was peopled ; Eastern and Central and Northern Asia by way of Burma and the gorges of the Brahmaputra ; Semitic Arabia and Western Asia, and Northern Africa from the mountains of Kurdistan [Ararat] and Armenia ; and Aryan Asia and Europe from the valleys of the Hindu Kush and Western Himalayas. The mountains of Armenia, the Elburz, Hindu Kush, and Western Himalayas may be generally identified with the earthly Paradise of the Semitic and Aryan races. It was one race which wandered forth from Lemuria to the utmost ends of the earth, and under the influence of diversified physical circumstances became many races, and reached at last its highest intellectual development in the Semitic and Aryan races. The higher civilisations seem always to have originated in the contact or mixing of different races. The contact and ultimate mingling of the Aryan with Turnaian races produced the simple, intellectual civilisation of India. On the other hand, the mingling of the Semitic with Turanian races, under later Aryan domination, produced the imposing material civilisation of Assyria ; while the elaborately symbolical religious civilisation of Egypt would seem to have been the result of the mixture of a Semitic element with the original Turanian race of the higher Nile valley, and probably of an Aryan influence received indirectly through Assyria and India. The consummate artistic civilisation of Greece was the effect of the contact of a pure Aryan race with the already advanced civilisations of Phœnicia and Egypt. Everywhere the keen, bright, energetic Aryan race excited the other races to a higher civilisation, and only the civilisations in which the Aryan element is pure or predominant have proved progressive; those in which it was overwhelmed by the Turanian races having always been unprogressive, as in India, Egypt, and Assyria.

The development of civilisation in its higher forms is, in fact, in

the order of the Aryan exodus. The emigrants who had, between B.C. 3000 and 2000, made their way into India first settled on the Upper Indus [Vedas], where they appear to have quarrelled among themselves [Mahabharata], when some of them moved on to the Ganges and ultimately descended into the Deccan [Ramayana]. Others turned westward, and, following the southern slopes of the Hindu Kush and Elburz, and constantly joined by fresh emigrants from High Asia, first settled Media [the modern province of Azerbijan], where they came into contact with the Semitic populations which had already occupied Mesopotamia, Arabia, and Syria to the shores of the Mediterranean Sea, and afterwards Persia.

As other tribes pressed forward, Armenia, Pontus, Paphlagonia and Bithynia were occupied, and, crossing the Bosphorus, the "earth-born Pelasgians" planted their colonies in Thrace, Macedonia, Thessaly and Epirus, in the islands of the Ægean Sea, in the Peloponnesus, and in Italy. A parallel emigration of Aryas and Semites would seem to have advanced in successive waves along a more southerly route, through the Cilician and Pamphylian mountains [Mount Taurus] into "sheep-feeding Phrygia," and the plains of Lydia, "distant Lycia," and Caria, and across the Ægean to Rhodes and Crete. Later the Hellenes, probably a predominant tribe of the Pelasgi, spread from Thessaly over the whole of Greece. In Central Europe the Celts came first, over the Caucasus and round the head of the Black Sea, and followed by the Teutons were pushed on into Gaul and Britain, Northern Italy and Spain. Calais, formerly written indifferently Caleys and Waleys, indicates the spot whence the surplus population of one of these Celtic settlements first crossed over to Britain. Wales is the "Pays de Galles": and Galicia in Austria, and Wallachia in Roumania, are said to have been the settlements of the Celtic horde which, three hundred years before Christ, pillaged Rome and Delphi, and, crossing the Bosphorus back into Asia, gave its name to Galatia.* The Sclavonians, who had advanced from beyond the Caspian and the Sea of Aral far towards Central Europe, were displaced eastward by the Teutons, of which race, also, were most of the tribes whose repeated irruptions at last broke up the fabric of the Roman Empire. But they were Aryas, whose destiny it was to purge civilisation, and not destroy it as did the later Turanian conquerors of the Eastern Empire.

As Rome fell the nations of modern Europe rose, developing with their rise a wider prosperity and, in many respects, a broader and more even civilisation than Greece and Rome ever knew; till in the 16th and 17th centuries they began to overflow the bounds of Europe, and to go forth to subdue India and the Eastern Archipelago, and to colonise America and Australasia, where now, at last, along all the shores of the Pacific

* Galata, a suburb of Constantinople, regarded by some as a vestige of the passage of this horde, is thought by others to be the Arabic *kilah*, a fort, found in Alcala in Spain, Calata in Sicily, and Khelat the capital of the Indian province of Baluchistan. See Taylor's "Words and Places."

Ocean, they are again brought face to face with that same dominant yellow Turanian race which has dogged their steps from the first day that they began their westward emigration from the high table-lands of Central Asia, which has held Constantinople against them and the whole pressure of the Sclavonic Aryas for 400 years, and which, some warning prophets threaten us, may yet subvert Aryan civilisation throughout the world as it has in India and Persia and over all Western Asia.

Five thousand years ago we see the Aryas first strike their tents on this momentous westward march, advancing always until they reach the shores of the outer Ocean stream; and after halting there for two thousand years, once more setting forward on a fresh migration, this time across the vast waters of the Atlantic, to search out that commerce of India, the tradition of which, probably, never altogether lost by them, would attract them even more than the actual commerce then in the hands of the Venetians.

Historical Dates.

More clearly to appreciate the relative force of the influences which have determined the character of Hindu and Indian art, it is necessary to review in somewhat greater detail the history of the states and nations of Southern and Western Asia, and the Mediterranean, with which India is connected, and this may perhaps be most conveniently done by a rapid enumeration of some leading dates. It will be recognised that the earlier of them are approximate only, and that many must be purely conjectural, and are given simply because it is often advisable to fix a time-mark. There is little connected, or even consistent, history before B.C. 1000, and few dates anterior to B.C. 500 can be accurately determined. Even stone monuments sometimes bear testimony rather to the falsehood of those who set them up than to the truth, which should prevail in history. Indeed, the longer they were likely to endure, the more inducement was there for falsifying them.

The Phœnicians are said to have first appeared on the shores of the Mediterranean from the Persian Gulf about B.C. 3000. Of the contemporary Egyptian and Babylonian kingdoms, which were the earliest political organisations, the date of the first native Egyptian dynasty is fixed about B.C. 2500, and of the Semitic Shepherd kings (Hyksos) B.C. 1750, and the restored (18th) native dynasty B.C. 1500. The commencement of the first, or Turanian period of the Babylonian kingdom, has also been fixed about B.C. 2300; and that of the Semitic period at B.C. 2000; Nineveh is said to have been founded B.C. 2200; and Babylon was captured by the Assyrians B.C. 1300, which is the date assigned for the commencement of the Assyrian Empire. Media was conquered by the Assyrians about B.C. 710, but was constantly in revolt, and B.C. 625 Cyaxares razed Nineveh to the ground, and reduced Assyria to a Median province. Babylon revolted under Nabopolassar B.C. 610, and was taken by Cyrus (who had already subjugated Media) B.C. 538; and the Persian Empire, which

Cyrus founded B.C. 559–529, was the first universal empire. Thothmes III. of the 18th Egyptian dynasty, and Rameses I. of the 19th, both led expeditions into Mesopotamia. Rameses the Great (II.), the grandson of Rameses I., and known also by the name of Sesostris, made the first canal between the Red Sea and Nile, which Pharaoh Necho, and Darius, and Ptolemy Philadelphus each afterwards attempted to re-open. About B.C. 1020, "Hadad being but a little child," having escaped from the slaughter of his countrymen, the Edomites, by King David, "fled unto Pharaoh, King of Egypt;" and about B.C. 1000, Jeroboam "fled " into Egypt unto Shishak, King of Egypt, and was in Egypt " until the death of Solomon." Solomon kept the peace with all his neighbours, Phœnicia, Edom, Egypt, and Assyria, even though carrying on the closest commercial competition with them; but B.C. 971, in the fifth year of Rehoboam, Shishak invaded Judah, and pillaged Jerusalem. About B.C. 730, Sabaco, the So of the Bible, made a treaty with Hoshea, which, involving the refusal of the King of Israel to pay the tribute to Assyria exacted by Tiglath Pileser and Shalmaneser, led to the taking of Samaria by Sargon, and the captivity of the ten tribes, B.C. 721. During the reign of Tehrah, the Tirhaka of the Bible, Sennacherib attempted to invade Egypt, when Tehrah advanced into Syria and defeated the Assyrians. During the reign of Psammetichus, B.C. 671–617, there was an extraordinary development of the commerce and prosperity of Egypt, consequent on his wise policy in throwing its ports open to free trade; and, under his son Necho, a Phœnician fleet accomplished the circumnavigation of Africa twenty-one centuries before the glorious enterprise of Bartholomeo Diaz and Vasco Da Gama. Necho also invaded Syria, and, being opposed by Josiah, King of Judah, slew him at Megiddo, and returning victorious from Carchemish took Jehoahaz captive into Egypt, leaving his brother Jehoiakim king in his stead. Four years later Nebuchadnezzar retook from Necho all that he had conquered, from the river of Egypt to the Euphrates. His son was the Pharaoh Hophra of the Bible, with whom Zedekiah, who had been set up as King of Judah by Nebuchadnezzar, made a treaty, in the hope of throwing off the yoke of Babylon. Pharaoh Hophra besieged and took Gaza and Sidon, and obliged the Babylonians, "the Chaldæans that besieged Jerusalem," to retire; but, on his having immediately to withdraw his own army, Nebuchadnezzar returned, and capturing Jerusalem, B.C. 606, led Judah away captive into Babylonia, whence, after seventy years, they were restored by Cyrus B.C. 536. Nebuchadnezzar sacked Tyre B.C. 586, and invaded Egypt. Cambyses conquered Egypt B.C. 526, and Xerxes subdued the revolt of Egypt B.C. 414. It successfully revolted under Amyrtæus against the Persians B.C. 411, was again reduced by Ochus, B.C. 350; and finally conquered by Alexander the Great, B.C. 332.

Of the four great tribes of the Hellenes, the Æolians, advancing from Thessaly, had occupied a great part of central Greece, as far as the Isthmus of Corinth, and of the western

coast of Peloponnesus ; the Achæans established themselves in Mycenæ, Argos, and Sparta, and the Ionians chiefly in Attica and Doris. The Dorians were originally restricted to Doris ; but, just as the Hellenes had become the predominant tribe over the Leleges, Caucones, and other Pelasgian tribes, so the Dorians became the predominant tribe over all the other Hellenes ; and when they entered the Peloponnesus, about B.C. 1000, and overthrew the ancient Achæan monarchies of Homer's epics, many of the Ionians sailed away to Asia Minor, and founded colonies at Miletus, Ephesus, and other places on the coast of Lydia, while the fugitive Achæans founded the Æolic colonies in Lesbos, and along the coast of Mysia. Smyrna was originally an Æolic colony, but afterwards became an Ionian city. Subsequently, the Dorians established colonies in Rhodes and Cos, and founded the cities of Halicarnassus and Cnidus, on the opposite coast of Caria ; and later still the Ionian [Phocæan] colonies were extended throughout the Mediterranean as far as Marseilles and Nimes, the Milesians encircling the Black Sea with their commercial establishments. Herodotus [Bk. I., ch. 163] says that the Phocœans of Ionia (originally from Phocis), were the first of the Greeks who made long voyages, and it was they who first made the Greeks acquainted with the Adriatic, and with Tyrrhenia, with Iberia and the city of Tartessus, (a colony of Tyre, the name of which signifies in the Phœnician tongue "the Younger Brother,") afterwards called Gadira, and now Cadiz.

Crœsus, the King of Lydia, made himself master of the Ionian cities, B.C. 550, and was himself subdued by Cyrus, and Lydia made a province of the Persian Empire, B.C. 546. The Ionian cities were not disposed to submit, but were unable to make common cause against their enemy. Some were abandoned, and the rest, one by one, yielded, sacrificing their liberties and prosperity, as Bias told them, to their mutual jealousies. Thus having subjugated both Phœnicia and the Ionian colonies, Persia at once became a great naval power, threatening the rising commercial supremacy of Athens in the Mediterranean. When, therefore, Miletus revolted, B.C. 500, the Athenians immediately sent 20 ships to the assistance of Aristagoras, and the Eretrians two, and their troops uniting with the revolted Ionians burnt Sardis. At the battle of Lade, B.C. 496, the whole navy of the Ionians, 353 ships, was destroyed by the Phœnician navy ; and then, having first reconquered the cities on the Ionian coast, the Persians determined to take vengeance on Athens and Eretria for their share in the burning of Sardis. The first expedition, under Mardonius, against Greece, B.C. 493, failed shamefully. The second, under Darius, B.C. 490, was defeated at Marathon. For the third, B.C. 480, Xerxes collected an overwhelming force, and it was only after Thermopylæ had been lost, and Athens burnt, and Salamis and Platæa won, that Greece was saved by the courage and energy of Athens, and the patriotism of the minor States of the Peloponnesus, which had become accustomed to act together under Sparta. But for this Greece would have perished like the Ionian colonies.

When Joshua, about B.C. 1450, led the children of Israel into Canaan or Phœnicia, Sidon was already "great Zidon," and Tyre, "the strong city of Tyre." He was opposed by a confederacy of the native states, led by the king of Hazor, whom he overthrew with great slaughter, and chased to the borders of Sidon [previously mentioned, Genesis x., 19, and xlix., 13], until he left none remaining; when he turned back and took Hazor, and slew the King thereof, "for Hazor aforetime was the head of all these kingdoms;" "and Joshua took all the land, the hills, "and all the south country, and all the land of Goshen, and "the valley, and the plain, * * * from the Mount Halak that "goeth up to Seir, even unto Baal-gad in the valley of Lebanon "under Mount Hermon" [Joshua, ch. ix.]. Subsequently Israel became tributary to the Philistines until the time of King David.

A year before the fall of Troy [B.C. 1183] the Sidonians also were defeated by the Philistines, and forced to seek a refuge in Tyre; and it is from about this time that the history of the Phœnicians ceases to be mythical and gradually becomes authentic. From Abibal, the father of Hiram, to the foundation of Carthage, we have a regular succession of reigns and dates. The splendid reign of Hiram commenced about B.C. 1000 and lasted 34 years. His son reigned seven years and his grandson nine, when he was put to death by a usurper who reigned 12 years, and was then deposed in favour of the legitimate heir, Hiram's great-grandson, who reigned 12 years. He was succeeded by a brother who, after reigning nine years, was murdered by another brother, who, after a few months, was in turn assassinated by Ithobaal, a priest of Astarte, the "Ethbaal, King of the Zidonians" of the Bible, and father of Jezebel, the wife of Ahab, who sought to restore the worship of Baal and Ashtoreth and of "the groves" in Israel [1 Kings xvi., 31]. He reigned 32 years, and was succeeded by Badezor, his son, who reigned six years, and he by his son Mutto, who reigned 32 years; and was followed by his son Pygmalion, the father of Elissa or Dido, the founder and Queen of Carthage, about B.C. 878–793: the date of the foundation of Rome being fixed at B.C. 753. This was the great period of the maritime ascendancy of Tyre in the Mediterranean. About the end of the eighth century B.C., however, it became a fixed object of the Assyrians to obtain possession of Tyre, a policy which was pursued also by the Babylonians and Persians. Shalmaneser endeavoured, without effect, to reduce it by blockade; and its siege by Nebuchadnezzar, extending over 13 years, is one of the most memorable in history, and proved a terrible blow to the greatness and power of the Phœnicians.

Phœnicia was the fifth of the twenty satrapies into which the empire of Darius was divided, but its relations with the Persians would appear to have been those of an honourable alliance rather than of absolute subjection, since, while the Tyrians assisted Cambyses against the Egyptians, and Darius and Xerxes against the Greeks, they refused to make war on the Carthaginians, "their own children;" and Cambyses could not force them, "because upon the Phœnicians all his sea service depended;"

" and so it was that the Carthaginians escaped, and were not " enslaved by the Persians" [Herod. III., 19].

It was the Phœnicians who first adventuring from inlet to inlet along the coast of Asia Minor with the precious freights of their eastern traffic, and from island to island across the hitherto untrampled floor of the blue Ægean, at last found themselves in Hellas, where the fair beauty of the women, when they were not to be enticed away to Sidon, tempted many a gaberlunyie Arab to remain: and thus the commerce and the arts of the East were introduced into Greece, and the civilization of the West began. The legends of Io, Europa, Medea, and Helen [Herod. I., 1–4], of the Argonautic Expedition, and of the wanderings of Cadmus and Harmonia, and of Dido, are all mythical fragments of the early commercial and colonial history of the Phœnicians and the Hellenes in the Mediterranean. From Canaan, the Phœnicians, originally from the Persian Gulf, were early beckoned onward by the mountains of Cyprus, which long preserved its Phœnician name of Kittim or Chittim, in that of Citium, which, with Paphos and Gorgos, were the chief seats of the worship of Astarte, Io, or Venus Urania, the great goddess of the Sidonians. Rhodes also was early colonised by them, being mentioned in Genesis x, 4 (*circa* B.C. 1500), under the name of Dodanin, or as some read it Rodanin, along with Javan (Greece), Elishah (the coasts of Asia Minor), and Tarshish, (here probably Tarsus, but generally identified with Tartessus, in Spain.) They also established their market-havens [" *banders*," or " *chipping*-havens," Copenhagen], factories or agencies, and settlements or colonies in Cicilia, Lycia, Caria, and Bithynia, in the Cyclades, Chios, "olive planted Samos," and Tenedos, where the Tyrian Hercules, Melcarth [*malik* "Lord," and *cartha* "city"], was worshipped under the name of Melicertes; and in Imbros, Thasos and Lemnos, where the local myth of the forges of Hephæstus was of Phœnician origin. Cadmus and his Arabs are said to have crossed from Chalcis in Eubœa into Bœotia, and the name of Onca, by which Minerva was worshipped in Thebes, is pure Phœnician. Under the myth of the flight of Dædalus, a name of Hephæstus, from Crete to Italy [Cumæ] and Sicily, we have the story of the Phœnician colonization of Sicily. They early occupied Malta [in Phœnician *Melita*, "the Place of Refuge"], and the other little islands leading to their settlements on the opposite Lybian coast, Utica [*i.e.*, *Uti-Cartha* "the Ancient City"], Hippo ["walled], and Carthage [*Cartha-hadtha*, "the New Town," as in the Kirjath of the Bible]. Corsica in Phœnician means "the wooded." Sardinia was originally colonised both from Tyre and Carthage, and Tartessus, afterwards Gadira [an "enclosure"] by the Tyrians, as the emporium of their trade in tin with Andalusia. The name of Spain, from which we derive the words Spinach and Spaniel, is itself derived from the Phœnician *span*, a "marten." Medina Sidonia, as the name given to it by the Saracen Arabs denotes, was a colony of Phœnician or Canaanitish Arabs, which was settled in Spain nearly 3,000 years before the establishment of the Western

Caliphate. "The Pillars of Hercules," the name given to the mountain of Calpe or Gibraltar [*jibel el Tarik*, "Tarik's Hill," of the Saracens] on the Spanish side of the *fretum Gaditanum*, and to Abila or Ceuta [*jebel-el-Mina*] on the Moorish, were so named from the temple of Melcarth, which marked the furthest western limits of the geographical knowledge of the Greeks down to the time of the Persian wars. But far beyond the Pillars of Hercules the Phœnicians had a station at Cerne on the Hesperidian coast of Africa; and the Carthaginian Hanno certainly reached the Gaboon country, and knew the untamable *gorilla* of Du Chaillu by its native name, even if he did not complete, as his Phœnician predecessors under the orders of Pharaoh Necho had done, the circumnavigation of the African continent. The Phœnicians gave its name to the Tagus, the "River of Fish," the word having the same root as the name of their "Fish God" Dagon. They traded to the Cornish coast for tin, and to the Baltic for amber. The frequency with which the names Phœnice and Phœnicus are found in classical lands, as in Egypt, Crete, Lycia, Lydia, Laconia, and Sicily bears witness to their presence everywhere in ancient times throughout the Mediterranean basin; while the name of the Cassiterides, derived from the Sanscrit word for the tin, which they first received from the Indian Archipelago, probably long before they quitted the Persian Gulf for the narrow coast of Canaan, and the fact that the Spanish town of Malaga near Gibraltar, and the Strait of Malacca, near Singapore, are so called from the same Phœnician word *malacca*, meaning "salt," prove how far reaching was the maritime and commercial enterprise of a people, whose history now survives almost only in the magic of a few geographical names, and the charm of the immortal fables of Greek mythology.

From its position Carthage commanded the whole western basin of the Mediterranean, and, when Tyre began to decline, Carthage, to which city the Tyrian refugees from Nebuchadnezzar fled, was in the zenith of her commercial prosperity and greatness. On the eve of Salamis indeed, the Mediterranean might be described as literally a Phœnician lake. While the Persians were advancing upon Athens, the Carthaginians, in concert with Xerxes, landed an army of 300,000 men under Hamilcar at Panormus, to simultaneously crush the Greeks in Sicily. The Persian (Phœnician and Cyprian) fleet was destroyed at Salamis, and the Carthaginian army utterly routed at Himera, with the loss of 150,000 men slain in the battle, nearly all the remainder surrendering immediately after. Twenty ships alone of all their armament escaped to Carthage with the fugitives; "and by a dramatic propriety," observes Mr. Bosweli Smith (in his book on "Carthage and the Carthaginians," just published), "which is not common in history, whatever it may be "in fiction, this double victory of Greek civilisation is said to "have taken place in the same year and on the very same day."

In her long struggle with Rome (B.C. 264—146) Carthage gradually lost resources, prestige, and one dependency after another, until at last Cato's inexorable "*Delenda est Carthago*" was fulfilled

to the very letter. Indeed, if Rome was to be saved, Carthage must needs be blotted out. It was not, however, through any failure of her population, or of their enterprising spirit, or of the skill and genius of her generals, that Carthage finally fell. It was entirely in consequence of the narrow commercial policy and personal animosities of her party leaders. During the Punic wars, almost to the end, the material advantages were with the Carthaginians; and over and over again Rome was brought to the verge of ruin, and the empire of Europe, as of Africa, lay in their grasp. But at every crisis of the melancholy history, in spite of their superior material resources, they were always paralysed by the fatal rivalries of their political factions; and it was thus that, from one humiliation to another, they step by step succumbed before the persistent policy and military organisation of the irresistible moral power of Rome; until the once mighty city of Carthage was literally ploughed into the desert sands out of which it had arisen like a bright exhalation of the morning.

Alexander the Great destroyed Tyre, and made himself master of Egypt B.C. 332, and took Babylon and finally subjugated Persia B.C. 331. He invaded India B.C. 327, and to this expedition we owe all our real knowledge of Indian history in ancient times. Before Alexander's invasion we have only the Vedas, dating from about B.C. 1400, the Code of Menu, B.C. 900–300, the sacred legends of the Ramayana, B.C. 400–350, and the Mahabharata, B.C. 500–250, to depend upon. Even the later Puranas, composed during the revival of Brahminism, between the decline of Buddhism and the Mahommedan conquest, which gives us the dynastic history of India from the time of Chandragupta, the Sandrocottus of the Greeks, treat principally of mythology and doctrine. Neither by Homer, Pindar, nor Euripides, are India or its people mentioned by name. Æschylus mentions "the wandering Indians," and Sophocles "Indian gold;" but although they knew its name they really knew nothing of the country, and it was not until the Persian war that the Greeks became aware of the existence of the enormous peninsula lying east and southward of the Indus. It is more than probable, however, that Homer confounded India with Africa under the general name of Æthiopia, while by later Greek writers sometimes Æthiopia is called India. Alexander believed that he would find the sources of the Nile in India. The first Greek who speaks of India by name is Hecatæus of Miletus, B.C. 549–486. The knowledge of Herodotus was limited to the satrapies of Darius, the twentieth of which included the part of India subject to Persia. In the Bible the first and only mention of India by that name is in the Book of Esther [*circa* B.C. 450, ch. i. 1, and ch. viii. 9] wherein we are told that Ahasuerus reigned "from "India even unto Ethiopa, over an hundred and seven and "twenty provinces." This Ahasuerus was Xerxes, and the feast he held "in Shushan the palace," in the third year of his reign, was to arrange the invasion of Greece; and it was to console himself for the defeats of Salamis, Platæa and Mycale, that he took Esther into his "house royal," and made her Queen instead of

Vashti, in the seventh year of his reign. It is evident that India only became generally known during the course of the Persian wars with Greece, and most probably it was during the wars of Cyrus that its name was first heard in the West. Ctesias, B.C. 400, wrote 23 books on Persia and one on India, all of which are lost except the fragments in Photius, to whom also, and to Diodorus, we owe the extracts which they have preserved from the work of Agatharcides, B.C. 146, on the Erythrean Sea.

All our real knowledge of India dates from Alexander's invasion of the Punjab, where he crossed the Indus at Attock in April B.C. 327, the first authentic date in Indian history. A number of Alexander's officers wrote descriptions of different parts of his route, and thus the ancients became possessed of the separate narratives, most of which have since perished, of Beton, Diognetus, Nearchus, Onesicritus, Aristobulus, and Callisthenes. Onesicritus is the first western writer to mention Ceylon, which was actually discovered for Europe by Almeyda, the first Portuguese viceroy of India, A.D. 1507. Subsequent to Alexander, in the early part of the third century B.C., the west coast of India was visited by Patrocles, the admiral of Seleucus, who also sent Megasthenes as his ambassador to Sandrocottus, and Daimachus to his successor Allitrochades at Palibothra or Pataliputra, the modern Patna. Ptolemy Philadelphus also, sent Dionysius on an expedition overland through Persia to India, soon after the time that Megasthenes was at Patna; and Ptolemy Euergetes, B.C. 145–116, sent Eudoxius on a voyage of discovery to the western coast of India. It is to the information collected by these officers of Alexander, Seleucus, and the Ptolemies, condensed, extracted, and reduced to a consistent shape by Diodorus, Strabo, Pliny, and Arrian, during the first century before and the first century after Christ, that we owe most of our knowledge of ancient India. Arrian, the author of the Periplus of the Erythrean Sea, almost a contemporary of Arrian the author of the "Indica" and the "Anabasis Alexandri," gives us a minute account of the sea-borne trade of India and of the coasts of the Erythrean Sea generally. Alexander's expedition and the embassies of Seleucus carried our knowledge of India from the Punjab to the mouths of the Indus and the valley of the Ganges; "the Periplus of the Erythrean Sea" extended it to the whole Malabar coast, and the Coromandel, as far as Masulipatam. Eratosthenes, the Alexandrian geographer, B.C. 276–161, describes India fully. Hipparchus, B.C. 150, the astronomer, follows Megasthenes, Daimachus, and Patrocles, and with Ptolemy, A.D. 139–170, our knowledge of India from classical sources ends. The Egyptian merchant, afterwards monk, Cosmas, called Indicopleustes, who traded about A.D. 535–550 in the Red Sea, gives a very definite account of the commerce between India and Egypt and Ceylon in his day, and the Chinese travellers, Fa Hian, who visited India A.D. 399–414, and Houang-Tsang A.D. 629–645, and the two Arabians who visited India and China in the 9th century, and whose travels were published in Renaudot's "Anciennes Relations," A.D. 1718, have added largely to our knowledge of India. But still the history

of Strabo is really the best general account we have of India until the travels of Marco Polo (b. 1254, d. 1324) and Ibn Batuta of Tangiers in 1341, and of Stevens and Fitch, and Bernier and Tavernier, and others in the 16th and 17th centuries. Vansleb's "Present State of Egypt," a narrative of his travels in that country in 1672–73, the English translation of which was published in 1678, gives as minute account of the trade of Egypt, at that critical period in the commercial history of India and the East, as Cosmas Indicopleustes and Arrian give respectively for the sixth, and first and second centuries after Christ. The India of Strabo is the India of the Maurya dynasty of Magadha, or Bahar, B.C. 325–118, the most brilliant and best known of the early Indian dynasties, to which Sandrocottus belonged, whose grandson, Asoka, established Buddhism as the State religion of India, B.C. 250, at which date the most intimate relations existed between India and Syria and Egypt, and the arts and literature and science of India reached their highest perfection.

After Alexander's death the Seleucidæ succeeded to the monarchy of Syria, B.C. 306–312 to B.C. [Tigranes] 79–65. Bactriana and Parthia revolted from them, B.C. 250. The Parthian Empire was overthrown by the revived native, or Sassanian, dynasty of Persia, A.D. 226; and the Græco-Bactrian kingdom was destroyed by an eruption of the Scyths, congeners of the Parthians, Mongols, Tartars, and other Turks, about B.C. 90; and, from the overthrow of Bactriana, to the Portuguese, Dutch, English, and French conquests, no European power again acquired dominion in India. But India had been deeply influenced by Alexander's conquest: and Cosmas Indicopleustes states that in his time, A.D. 535–550, nearly every large town in India had its Christian church under the archbishop of Seleucia. It was about this date that Buddhism began to decline in India. The Maurya dynasty had been succeeded by the Sanga or Kanwa, and this by the Andhra, B.C. 31 to A.D. 429, after which Indian history once more almost disappears, until the advent of the Mahommedans, A.D. 639–750, and again, A.D. 1001, under Mahmud of Ghazni. For 600 years India was now devastated by a succession of Afghan and Mongol conquests, and for 200 years more was torn by the contentions of the Mahratta confederacy, until delivered by the rise of the British power in India, alike from Mahommedan oppression (1803), Mahratta anarchy (1819), and invasion panics (1839–42).

Even under the Parthians the commerce through the Euphrates Valley with India was uninterrupted, and, after Syria had submitted to Rome, B.C. 65, Palmyra continued free for 300 years, until Zenobia was defeated by Aurelian A.D. 272–273, and was the great emporium between Rome and the Parthian and afterwards Sassanian kingdoms and the East. Egypt, on the death of Alexander, fell to the Ptolemies, B.C. 323, B.C. 30. Arts, commerce, manufactures, agriculture, and navigation obtained a most extraordinary development under them. They more than revived the ancient glories of Thothmes, Rameses-Sesostris, Psammetichus, and Necho; Alexandria became the first mart in the world; and

when Egypt in its turn became a Roman province, it was governed direct as a prefecture by the Emperors, not by the Senate, and was never in strict propriety a Roman province at all. The Romans were jealous to guard its privileges, and preserve the trade the wise policy of the Ptolemies had drawn to it; and no Roman was even permitted to enter the country without the express permission of the Emperor.

The Roman Empire reached its greatest extent during the age of the Antonines, A.D. 96–180, and may be said to have included within its limits all the countries of the world within the Rhine and Danube, the Tigris and Euphrates, and the Great Desert of Africa. Behind the Rhine and the Danube were the Franks, and Germans, and Goths, and other Teutonic tribes, who were destined to overthrow the Roman Empire; and behind the Tigris and Euphrates were the Parthians and Persians, the successful rivals of Rome in Asia. Two centuries more and Odoacer had taken Rome, A.D. 476, and the fall of the Western Empire was complete. But Rome still ruled the Eastern Empire from Constantinople, and Rome and Persia still continued their struggles along the border lands of the Tigris and Euphrates for supremacy in Asia.

It was at this time, A.D. 622, that Mahommed began to teach the revolutionary religion of Islam, and within one hundred years from his death every nation and tribe of the old Roman and Persian Empires, and nearly the whole known world, were almost simultaneously assailed by the Saracen Arabs. Egypt and Syria were both conquered between A.D. 632 and 639; and Persia, when the Sassanian dynasty was overthrown, between A.D. 632 and 651. Twice the Saracens besieged Constantinople, and twice they were repulsed, in A.D. 673 and A.D. 716. They conquered Africa between A.D. 647 and 709, and in the latter year crossed the Straits of Gibraltar and conquered Spain. They then invaded and advanced into the very heart of France, until they were met and beaten at the great battle of Tours by Charles Martel, A.D. 732, and forced to recross the Pyrenees. Spain they held for 700 years. They completely dominated the Mediterranean, and it was their ambition and their threat to preach the unity of God in the city of Rome itself. They had, however, already exhausted their aggressive virtue. In A.D. 750 the Ommiad dynasty of Damascus was overthrown by the Abbassides, who established themselves at Damascus [A.D. 750–1258], and one of the Ommiades escaping to Spain there re-established the Ommiad dynasty of Cordova [A.D. 755–1051], and thus was Islam divided between the Eastern and Western Caliphates.

The Saracens were an inquisitive, energetic, and ingenious race, and, in contact with the Greeks of Byzantium and the Jews, now scattered through every country in Europe, and round the Mediterranean, grammarians and philosophers, great chemists and physicians, mathematicians and astronomers rapidly rose among them, with a highly cultivated literature, and a new architecture and decorative art. Manufactures, especially that of silks, which had been recently introduced from China by the Emperor Justinian,

were carried to the highest perfection, and Baghdad and Cordova became everywhere famous as seats, not only of the most prosperous commerce, but of the highest learning and refinement.

But soon the Mongols and other Turks began to press on the Eastern Caliphate and Empire. Persia was ravaged by Togrel Beg and the Seljukian Turks, A.D. 1038. Chingiz Khan devastated all Asia, A.D. 1206–27. His son Octai pushed on into Europe, through Poland, to the confines of Germany; and his grandson Batou, at the head of the Golden Horde, overran and permanently barbarised Russia. The Western Caliphate had already been overthrown, A.D. 1051, by the Moors, and when Baghdad fell to Hulaku Khan, the nephew of Chingiz Khan, A.D. 1258, the splendours of the Saracenic Empire of the Arabs were finally eclipsed.

While the Eastern Caliphate was in confusion the trade of the East by way of Alexandria had gradually fallen into the hands of the Venetians, and Constantinople had also become the emporium of a considerable eastern trade by way of Asia Minor and the Euxine; and, after the capture of Constantinople by the Crusaders, A.D. 1203, the Venetians, who were jealous of the commercial competition of Constantinople, and had always helped the Crusaders, both against the Saracens and the Greeks, obtained the grant of a portion of the Peloponnesus, with several of the best islands in the Archipelago, thus securing to themselves the monopoly of the trade by the Euxine. But, when the Greeks rose and expelled the Latin Emperor, they bestowed on the Genoese, who had helped them, the suburb of Perá as a reward, thus transferring the monopoly of the Euxine overland trade to the Genoese, and forcing the Venetians to revisit Alexandria in order to carry on their commerce in the productions of the East.

Step by step the Ottoman Turks advanced slowly but surely on the fore-doomed Eastern Empire. They took Adrianople A.D. 1361. All the Greek possessions in Asia were lost by A.D. 1396. Bajazet laid siege to Constantinople A.D. 1402, but was called off to oppose an invasion of Tamerlane, a descendant of Chingiz Khan, and the progenitor of the Mogol Emperors of Delhi, and it was not until A.D. 1453 that the city fell to the assault of Mahomet II. The Turks conquered Egypt A.D. 1617, and took Baghdad for the last time A.D. 1638; and, ever since then, have remained the masters of three positions of imperial command, which would have given any other race the dominion of the world. For more than two centuries they have held possession of all the overland routes to India, by Alexandria and the Red Sea, by Baghdad and the Persian Gulf, and by the Euxine, Bayazid, and Persia, and in Constantinople have occupied a position which absolutely safeguards them all, but they have held them only to obstruct. The Eastern Question in its widest sense is, indeed, the question whether the civilisation of Europe, which was so strongly established by the Greeks in Persia and India, and has for a thousand years been cut off from

those countries by repeated irruptions of savage hordes, is to be for ever barred in its free course eastward along all the great historical overland routes between Europe and Asia.

The Crusades [A.D. 1096–1291] were not altogether disinterested efforts to deliver the Holy Places at Jerusalem from the hands of the Moslem infidel. They were also largely influenced, at least the later Crusades, by the spirit of commercial enterprise. They were, in this character, an unsuccessful attempt to reopen direct communications with India. But the energy of Europe was not to be baffled. The fortunes of Venice, the universal mart of the splendid traffic of the East, excited the Spaniards and the Portuguese to seek out India for themselves across the vast Atlantic Ocean, and, in seeking it, the Spaniards found America, the West Indies [A.D. 1492], on the way; while the Portuguese, by sailing round the Cape of Good Hope, discovered the true India [A.D. 1497] of Byzantine and Venetian commerce, and of the legendary histories and romances of Alexander. The Turks, beset by the Portuguese behind them, and the Austrians and Hungarians before, would have been fast driven back across the Oxus and Jaxartes again, but that popular emigration from Europe was attracted to America. Thus the regeneration of Greece, Palestine, Syria, Egypt, and Persia, was delayed for 200 years; but Seneca's famous line was fulfilled, "Nec sit Terris ultima Thule," and the ever energetic Aryas hastened forward with the setting sun to people a new Atlantis.

> "Westward the course of Empire takes its way;
> The first four acts already past,
> A fifth shall close the drama with the day;
> Time's noblest off-spring is the last."

The discovery of Bartholomeo Diaz and Da Gama, although not mortal, was the first blow struck at the Turkish power. Deprived of the trade with India, their naval supremacy in the Mediterranean was undermined, and they were never really able to recover from the effects of the battle of Lepanto, A.D. 1571, when the combined fleets of Spain, Venice, Genoa, Malta, and Pius V., commanded by Don John of Austria, defeated the whole maritime force of Turkey. The Portuguese discovery also had another beneficial effect. While it impoverished all the Mediterranean countries until the establishment of the "Peninsular and Oriental Company" and Waghorn's new "Overland Route" to India, the Atlantic countries of Western Europe were proportionally enriched, for, even before they began to participate in it directly, they, rather than Lisbon, reaped the profits of the Portuguese trade with India, and thus the triumph of religious and political freedom in Europe was made secure.

The Eastern and the Western Empire had passed away, and the wars of the sixteenth and seventeenth centuries had established the independence of the states which have since exercised a preponderating influence in Europe, when the Dutch and English, following up the maritime discoveries of Spain and

Portugal, began those obscure movements of colonisation, commerce, and conquest in the new world and the old, beyond seas, in the far East, which, in two hundred years, have given Europe the dominion of America and the Indies, and the lead in the trade and civilisation of Southern Asia, from Constantinople to Pekin, a position of advantage not be overlooked when the thoughts of statesmen and of nations are perplexed by fear of the things which are coming on the world.

THE ANTIQUITY OF THE INDIAN TRADE.

The earliest, most valuable, and fullest notices of the Indian trade are in the Bible; and the collection of the vegetable, animal, and mineral productions of India sent by the British Government to the present exhibition illustrates in a very interesting manner the proofs the Bible affords of the immense antiquity of the trade. Moses, about B.C. 1500, in Genesis ii. 11, 12, describing the first head, Pison, of the river of Eden, says, "That is it "which compasseth the whole land of Havilah, where there is "gold * * there is bdellium and the onyx stone." Bdellium is the gum resin of the *Balsamodendron Mukul* and *B. pubescens* of Stocks, both natives of Scinde; and, if the Hebrew word *bdolach*, translated by Bdellium in this passage, really means Musk, as Lassen argues from the description of "bdellium" [*bdolach*] in Numbers xi. 7, and from the affinity of the Hebrew word *bdolach* with the Sanscrit word *madalaka*, which he thought meant *musk*, but which I believe to mean Bdellium, the *mukul* and *gugul* of the Arabs and Hindus, all the same, as Bdellium is, so is Musk peculiarly an Indian product, the Musk deer being a native of the Himalayas and Western China. The connexion of the "onyx" in this passage with Bdellium recalls Pliny's description of Bactrian [Indian] Bdellium:—"It is shining and dry, and covered with "numerous white spots resembling the finger nails." Such Bdellium would appear to be the βδέλλη ὄνυξ of Damocritus, an obscure medical writer quoted by Saracenus in his *Scholia in Dioscoridem*, and of Galen as quoted by Salmasius in his *Plinianæ Exercitationes*. Salmasius distinctly states, 200 years before Stocks' discovery, that from these Greek words μαδελκὸν and μαλαχὴ the Arabic *molochil* and *mukkul* are derived. Of course we now know that these Greek words are derived from the Sanscrit, through the Arabic and Phœnician; which, however, only strengthens the argument against Lassen's identification, and conclusively confirms the correctness of the identification of *bdolach* with Bdellium in the authorised version of the English Bible. The "onyx" in the passage is the Hebrew *shohem* and not the Hebrew *shecheleth*, and although there is nothing in the context here, or elsewhere where *shohem* is mentioned [Ex. xxviii. 9, 20; 1 Chron. xxix, 2; Ezek. xxviii. 13] to help us to determine its signification, and there is generally the greatest difficulty in identifying the precious stones mentioned in the Bible, there can be little doubt, taking all the passages, in which *shohem* is mentioned, together, that the Onyx is meant.

From Ex. xxx. 22–38, we find that myrrh, and "sweet cinnamon," "and sweet calamus," and cassia were used in the preparation of "the holy anointing oil" for the service of the Jews' Tabernacle, and stacte, and onycha, and galbanum, "with pure frankincense," in the preparation of "the holy perfume." Here "onycha" is the Hebrew *schecheleth*, the "odoriferous shell," the *operculum* of a species of *Strombus* or Wing Shell, formerly well known in

Europe under the name of *Blatta Byzantina*, which is procured both in the Mediterranean and Red Sea, and is occasionally to be seen at the Custom House in Bombay, where it is imported to burn with frankincense in the temples, not so much on account of any pleasing odour of its own, as to bring out the odours of other perfumes. Galbanum [*chelbonah*] is a product of Syria and Khorassan. Stacte or Storax [*nataf*] was in classical times the product of *Styrax officinale*, a native of Palestine, Syria, Greece, and the Levant, but at present is obtained in Europe only from *Liquidambar orientale*, a native of Cyprus and Anatolia. Myrrh [*mor*, from the Arabic, Psalms xlv. 8; Prov. vii. 17; Song of Solomon i. 13; v. 5; Esth. ii. 12; Matt. ii. 11; Mark xv. 23; John xix. 39; and *lot* Gen. xxxvii. 25; xliii. 11] and frankincense [*lebonah* from Arabic *luban* Ex. xxx. 34; Song of Sol. iii. 6; iv. 14; Isaiah xliii. 23; lx. 6; lxvi. 3; 2 Chron. xxvi. 16, 18, 19; Lev. xvi. 12, 13; Jer. vi. 20; xvii. 26] are both products of the south of Arabia; Cinnamon [*kinnamon*, also Prov. vii. 17; Song of Sol. iv. 14; and, κινάμωμον, Rev. xviii. 13] of Ceylon; while "sweet calamus" [*keneh bosem*; the "sweet cane," *kaneh hotteb*, of Jer. vi. 20; and calamus, *kaneh*, of Song of Sol. iv. 14; and Ezek. xxvii. 19] the *Andropogon Calamus-aromaticus* of Royle, is exclusively an Indian plant, the Roosa grass of Anglo-Indians, closely allied to *A. muricatus*, the fragrant roots of which are made into *Cuscus* fans and *Cuscus* tatties. The *Calamus aromaticus* of the older pharmacologists is the root of *Acorus Calamus*, the Sweet Flag. The Hebrew word, in Exodus xxx. 24, translated Cassia, is *kiddah* (in Ps. xlv. 8, it is *ketzioth*); and here, undoubtedly, Cassia lignea is meant, a product of India and China.

In Numbers xxiv. 6, Balaam compares the camp of Israel to "a garden by a river side, as the trees of lign-aloes which "the Lord hath planted, and as cedar trees beside the waters." The better kind of Lign-Aloes [Hebrew *ahalim*, *ahaloth*; Ps. xlv. 8.; Prov. vii. 17; Song of Sol. iv. 14, and ἀλόη; John xix. 39.] is produced by the leguminous tree *Aloexylon Agallochum*, a native of Cochin China, and the inferior by *Aquillaria Agallocha*, a native of India beyond the Ganges, the Malayan name of which is the root of most of the synonyms of this most precious of all perfumes, viz., the Sanscrit *agaru*, the Hebrew *ahalim* and *ahaloth*, Portuguese *Poa d'agila*, English Eagle wood, and Aloes, and Aloe wood, and the old commercial and pharmacological names Lignum Aquilæ, Agallachum, and Agallage. It is also called Calambac, from *Kalambok*, the Malayan name specifically for the wood of *Aloexylon Agallochum*. Balaam had probably never seen Lign Aloe trees, but he pictures them from the renown of their perfume, the result really of disease, as in glory like unto the cedars of Lebanon.

In the Song of Solomon (circa B.C. 1000) iv. 13, 14, mention is made, besides myrrh, aloes, cinnamon, frankincense, and calamus, of camphire, saffron, and spikenard. Here, and also in i. 14, camphire, the Hebrew *copher*, is the Egyptian *hennah*, *Lawsonia inermis*, a native of the East Indies, but cultivated from the

beginning of history in India, Egypt, North Africa, Syria, and the Levant. It is Pliny's "Cyprus in Egypt," and the women of Egypt and other eastern countries tinge their hands and feet with its ruddy dye, whence probably proceeds the designation of Aurora as "rosy-fingered," [ῥοδοδάκτυλος ἠώς]. In Egypt, on one of the nights before the wedding, *hennah* is applied with linen bandages to the hands and feet of the bride until the next morning, when they appear of that celestial rosy red which is love's proper hue, and this night, in the order of the marriage ceremonials, is called "the night of the *hennah*." Saffron is the stigmata of *Crocus sativus* in Hebrew *karkam*, the *karkum* and *zafran* ["yellow"] of the Arabs, the Sanscrit *kunkuma* and the κρόκος of the Greeks, a native of Cashmere; and Spikenard [Song of Sol. i. 12, and νάρδος, Mark xiv. 3, John xii. 3, 7], the root of *Nardostachys Jatamansi*, exclusively a native of Nepal and Bhotan at great elevations; and Costus, the Hebrew *ketzioth* [Ps. xlv. 8 translated by "Cassia" in the English Bible, and sometimes by "Orris root," so largely used by the Greeks and Romans in perfumery, and for which Macedonia, and Elis, and Corinth were so famous], and Sanscrit *Koot*, the root of the *Aucklandia Costus* of Falconer, exclusively a native of Cashmere: and these three famous products of the Himalayas, with Bdellium, the Vine, Pomegranate, Lign Aloes, Salep, and Hemp, and Musk, and the Balas ruby, Lapis Lazuli, and Turquoise have probably been known from the earliest associations of the Aryas with India, whence the Saffron *Crocus* and Hemp plant have followed their migrations everywhere throughout the temperate zone of the globe. Sir William Jones was the first to identify Spikenard with the root of *N. Jatamansi*. The word *nard* he found to be Persian, and the Persians, as the overland carriers of *Jatamansi* between India, and Kirman, and Gerrha, and Mesopotamia, had communicated their name for it to the Hebrews [*nerd*], and Greeks [νάρδος], and Romans [*nardum*]. Spikenard is *Spica Nardi*. It is strange that the identification was so long overlooked, for Avicenna uses the word *sumbul* as the synonym of νάρδος; and Persian books give among the synonyms of *sumbul*, Arabic, *sunbul*; Greek, *narden*; Latin, *nardoom*; and Hindi, *jatamansi* and *balchar*.

The *algum* trees "out of Lebanon," of 2 Chron. ii. 8 and ix. 11, and *almug* trees "from Ophir" of 1 Kings, x. 11, 12 [both references being of about B.C. 500], have been generally identified with the true Sandalwood, *Santalum album*, of the mountains of the Indian peninsula and Eastern Archipelago, because one of its Sanscrit names is evidently the same word as the Hebrew *algum*, or *almug*. But considering the use to which Algum or Almug wood was put by Solomon, for flooring and pillars, and to make musical instruments, I believe that it was probably not Sandalwood, but some hard, close-grained wood like *shisham* or *sissoo* [*Dalbergia* sps.], well known as "Bombay Blackwood," or the Red Saunders Wood, *Pterocarpus Santalinus*, of the Coromandel coast, Palghat, and Ceylon, of which most of the musical instruments in India are made. Nevertheless, Sandalwood is used in India for the pillars and doors of temples. The

famous gates of the temple Somnath, carried off to Afghanistan by Mahmud of Ghazni A.D. 1025, and restored to India by Lord Ellenborough in 1842, were found, on examination, not to be, as was generally said, of Sandalwood, but Deodar. They are still lying in the fort of Agra. Sandalwood is possibly the ξύλα σαγάλινα of the Periplus of the Erythrean Sea, and is certainly the τζανδάνα of Cosmas Indicopleustes. It is mentioned in the earliest writings. Ebony, mentioned in Ezekiel [circa B.C. 600, ch. xxvii, 15, *hobnim*,] is produced in India by *Diospyros melanoxylon*, and in Ceylon and the Moluccas by *D. Ebenum*. The tree which produces African Ebony is unknown.

The word "cotton" is not used in the English translation of the Bible, but in the passage of Esther [circa B.C. 450] ch. i. 6:— "where were white, *green*, and blue hangings;" the Hebrew word, translated "green," is *karpas*, identical with the Sanscrit *karpasa*, and Hindi *kapas*, cotton (in the pod), an aboriginal Indian production. The passage should be read, "Where were white and "blue (striped) cotton hangings," like the *sattrangis* made all over Hindustan at the present day. *Karpasa* is the origin of the Greek κάρπασος, and Latin *carbasus*, flax, having probably the same root as καρπός, fruit, and *carpo*, I pick, pluck, gather (*i.e.*, the fruit, the cotton pods), and as καρπὸς and *carpus*, the wrist—the hands, with which the Aryan race gathered and wove cotton from the dawn of history, and carried the weaving of cotton, wool, hemp, and flax with them into all lands. Cotton is the Arabic *kutn*, and Egyptian *kotn*.

The Egyptians are known to have cultivated and woven Cotton from the earliest times. They used also Cassia, with "the purest bruised myrrh," and "every sort of spicery except frankincense" in embalming their dead [Rawlinson's Herodotus, ii. 86]. The sacred Indian Lotus also, *Nelumbium speciosum*, while everywhere represented on the later Egyptian sculptures, is never seen on the earlier, and is now nowhere found in Egypt. Whether Nepenthe, the φάρμακον νηπενθὲς of Homer [Od. iv. 221–229] be Opium (the μηκώνιον of Theophrastus) or *hashish*, the extract (of which no Greek or Roman writer on drugs makes any mention) of hemp, it must have been originally obtained from India, the Opium Poppy, *Papaver somniferum*, and the *hashish* Hemp, *Cannabis sativa*, var. *indica*, both being cultivated Indian varieties of plants, of which the Hemp is also originally a native of the Himalayas, Hindu Kush, and Caucasus. The Greek κάνναβις and Latin *cannabis* are both identical with the Sanscrit *kanam*, as well as with the German *hanf* and English hemp. More directly from *cannabis* comes canvas, made of hemp or flax, and canvass, to discuss, *i.e.*, sift a question, metaphorically from the use of hempen sieves or sifters. From *hashish*, a herb, comes assassin, through *hashishin*, *i.e.*, "hemp eaters" [Hemp being *par excellence* the herb, as Opium, ὀπός, is the juice, Bark, (Chinchona) the bark, and *Musa*, (Plantain) the taste, flavour, whet, relish, or *gustum*], the infamous sect of assassins formed in Persia and Syria in the 11th century, who used to intoxicate the *fedavi*, or "devoted ones," before sending them forth on their murderous

errands, with *hashish*. The phrase "to run amuck" [Pope] comes similarly from the *amuki* of Malabar, young men, among the Nairs, "devoted" to defend the King's life by their own [Yule, "Marco Polo," ii. 284], through the *a-muk* of the Malays, who under the influence of Opium sometimes become so wild that they rush forth into the streets, yelling "*a-muk! a-muk!*" and stabbing at all they meet.

The phrase, "Open Sesame!" is from the Indian Oil Seed, *til*, or *Sesamum indicum*, the cultivation of which was carried in the earliest ages into Mesopotamia and Egypt, where it became known under the name of *Semsen*; and "Open Sesame!" is equivalent to "Bring in the candles," "Light the gas;" bring light, which opens everything, which neither wheat nor barley could give Cassim Baba, but only the Oil Seed *Sesamum*.

Several other exclusively Indian vegetable productions, or of the Eastern Archipelago, are mentioned by the earliest Greek and Latin writers on drugs, which, although not mentioned in the Bible and Homer, it is desirable to enumerate on account of the light which they throw upon the intimacy and antiquity of the intercourse between Asia and Europe.

The CITRON, *Citrus Medica*, the *μῆλον μηδικὸν* of Theophrastus, a native of the Himalayas, and cultivated apparently from the time of the earliest Aryan settlements in Media, whence it derives its Greek and specific scientific name. Media also gives its name to Medic, or Lucerne grass, *Medicago sativa*, which was introduced from Media into the Balkan peninsula during the Persian invasions of Greece under Mardonius, and Darius, and Xerxes; as *haryali* grass, *Cynodon Dactylon* was introduced by the British-Persian Expedition of 1856–57 from India into Fars and Khusistan. Citrus wood, so extravagantly prized by the Romans for furniture, is the Thyine wood, *ξύλον θύινον* of the Book of the Revelation xviii, 12, the *Callitrus quadrivalvis* or jointed *Arbor Vitæ* of botanists, which yields also the resin Sandarach.

PEACHES and APRICOTS are natives of Persia. Apricots also are wild throughout the central mountain range extending across Asia from the Pacific to the Mediterranean, and reappear along the Atlas Mountains on the shores of the Atlantic. The Peach is the *μηλέα περσικὴ* of Theophrastus and Dioscorides, and the *Persica*, whence Peach, of Pliny. The Apricot, the *μηλέα ἀρμενιακὴ* of Dioscorides, and *malus Armeniaca* of Pliny, is the *πραικοκκία*, and *præcocia, i.e., early* Peach; whence the Arabic *al-burquq*, Spanish *albaricoque*, Italian *albicocco*, French *abricot*, and English Albricock (old form) and Apricot.

RUSOT, the *λύκιον ἰνδικὸν* of Dioscorides, is the extract of *Berberis Lycium* and *B. aristata*, both natives of the Himalayas. The esteem in which it was held by the Greeks and Romans is shewn by the classical vases which yet remain, in which Lycium was kept, bearing the name of the seller of the extract.

INDIGO, old English Indico, the *Indicum* of Pliny, and *ἰνδικὸν βαφικὸν* of Dioscorides, is the prepared juice of *Indigofera*

tinctoria, the Sanscrit name of which, *nil*, appears through the Portuguese *anil* in "aniline."

GUM LAC and LAKE are thought to be mentioned by Ctesias. Lac is the resinous exudation produced on certain Indian trees by the *Coccus Lacca* or Lac insect, and Lake, the dye soaked out of the resin, that is, soaked out of the female insect imbedded in it. The name Lac has been given to it by the Hindus because of the *hundred thousand*—the multitude—of these small insects found in it, and from *lac*, a hundred thousand, thus come Gum Lac, Lake, and Lacquer.

GUM DRAGON. This is certainly the κιννάβαρις of Dioscorides and Indian *cinnabaris* of Pliny. Dragon's Blood, or Gum Dragon, is obtained from the *Calamus Draco*, one of the Rattan Palms of the Eastern Archipelago, and *Dracæna Draco*, a liliaceous tree of the Canary Islands and Madeira; and *Pterocarpus Draco*, a leguminous tree of the same genus as the Indian Kino tree, is believed to be the source of the Gum Dragon of Socotra, the *dam-ul-akhawein* of the Arabs. It was probably the Dragon's Blood of the Canary Islands, which the Greeks and Romans knew, or first knew, for we have complete evidence from the Periplus of the Erythrean Sea that about the first century A.D., they knew also that of Dioscorida, the classical name of Socotra, corrupted, as the name Socotra also is, from the Sanscrit *dvipa-sukadara*, "the abode of bliss," which, contracted into *diuscatra*, became Dioscorida among the Greeks and Socotra among the Arabs. The μακάρων νῆσοι, "the islands of the Blessed" of Greek fable, were supposed to be somewhere in the Atlantic Ocean, and when the Canary Islands were discovered, the Romans at once named them the *Fortunatæ Insulæ*. Also Pliny, Book xxix, ch. 8, distinguishes it as Indian Cinnabar, when he speaks of the fatal mistakes often made by physicians in giving "*cinnabaris nativa*," or "*minium*," for it to their unfortunate patients. This reference has been altogether overlooked by those who deny that the Greeks and Romans knew the Gum Dragon of the eastern trade. From *miniaria*, Minium mines, comes the word mine itself.

CASTOR OIL. The plant is the κίκι of Herodotus and Dioscorides, and κρότων of Hippocrates, Theophrastus, and Dioscorides; supposed also by some to be the *kikayon* "Jonah's Gourd" of the Bible, and hence called *Palma Christi*. St. Jerome and St. Augustine are said to have disputed this identification so hotly that from the force of argument they passed to the argument of force, and actually exchanged blows on the subject. It is exclusively indigenous to the East Indies.

BLACK PEPPER, exclusively indigenous to Travancore and Malabar, the Sanscrit *maricha*, and Persian *pilpil*, the origin of all its western synonyms. It is the πέπερι στρογγύλον of Theophrastus, the πέπερι μέλαν of Dioscorides, and *piper* of Pliny, and *Piper nigrum* of botanists.

LONG PEPPER, *Chavica Roxburghii*, a native of the Eastern Archipelago, is the πέπερι μακρὸν of Dioscorides and *piper longum* of Pliny.

CUBEBS, the berries of *Piper Cubeba*, a native of the Eastern Archipelago, is thought by some to be the μυρτίδανον of Hippo-

crates; but the first who unequivocally mention it are Masudi of Baghdad, about A.D. 915–920, and Edrisi about A.D. 1153. It was used as a spice down to the middle ages "but the importation " had long ceased, when its medicinal uses became known during " the British occupation of Java." [Yule, "Marco Polo," ii. 326.]

Cardamoms also are first unequivocally mentioned by Edrisi. Theophrastus and Dioscorides both mention a καρδάμωμον, and Dioscorides an ἄμωμον, and Pliny an *amomum* and a *cardamomum*, but it is impossible to distinguish what they mean. There must needs be great confusion, unless their natural characters are very marked, in identifying the numerous pungent berries and dried buds in use in India as condiments, many of which are seldom seen in commerce, as Cassia buds, *nagkiser*, the flower buds of *Calysaccion longiflorum*, *tejbul*, the seeds of *Xanthoxyon hastile*, and many others; and Pliny always makes any confusion more confounded, from his habit apparently of leaving hired clerks to compile his extracts from previous writers, just in the all-devouring, lazy, and uncritical way in which I have seen learned Hindus conducting their philological and antiquarian researches.

Cloves were certainly known to the Greeks and Romans. They are the dried flower buds of the myrtle bloom *Eugenia Caryophyllata*, a native exclusively of the Moluccas, and are without doubt the *garyophyllon* of Pliny and καρυόφυλλον [etymologically "nut-leaf,"] of Cosmas Indicopleustes and Paulus Æginetа, A.D. 600–700, although Sprengel says they are first mentioned by Simeon Seth, A.D. 1000–1100. The passage in Pliny is, "est " etiamnum in India piperis grani simile, quod vocatur garyo- " phyllon, grandius, fragiliusque . . . . advehitur odoris gratia." The objection is that the clove is not *larger* than a peppercorn but *longer*. But both Cicero and Juvenal use the words *grandis epistola* for a long letter; and the Indian Bazaar *Yonanee*, *i.e.*, Greek synonym, for Cloves, is *kurphyllon*.

Turmeric, *Curcuma longa*, is the κύπειρος ἰνδικὸς of Dioscorides and "*Cypria herba indica*" of Pliny.

Ginger, *Zingiber officinale*, is the ζιγγίβερις of Dioscorides and *zingiber* of Pliny, derived through the Arabic or Persian *zingibil* from the Sanscrit *sringavera*.

Sweet Flag, the root of *Acorus Calamus*, a plant indigenous to all the countries of the north temperate zone, or Cestus belt, in the old world and new, is the ἄκορον of Dioscorides, the Arabic *akaron*, and from the earliest times a medicine of great fame in India, under the Sanscrit name of *vaka*, and Hindi *bach*. The κάλαμος ἀρωματικὸς of Dioscorides, and κάλαμος of Theophrastus, and "calamus" and "sweet cane" of the Bible, formerly identified with the Sweet Flag, were identified by Royle, as already stated, with the Indian Roosa-Grass, *Andropogon Calamus aromaticus*.

Salep, the tubers of several species of *Orchis*, natives of Central Europe and the slopes of the Taurus, Caucasus, Hindu Kush, and Himalayan mountains, which, through the influence of the doctrine of signatures, have ever held a fabulous reputation throughout the East for their restorative virtues; and that this reputation was extended at a very early age from the East to the West we have sufficient testimony in the name they bear.

RHUBARB is the ῥᾶ or ῥῆον mentioned by Dioscorides as brought from beyond the Bosphorus, and the *rachoma* of Pliny, which he says was brought from beyond Pontus. It is a native of south-eastern Thibet and the western and north-western frontiers of China, and is said to be mentioned by Chinese writers B.C. 2700! The Rha, which came into Europe by the ancient caravan routes from Northern China by Bokhara and Asia Minor, was naturally called *Rha-ponticum*, and that by Russia and the Danube *Rha-barbarum*. The designations Turkey, Russian, East Indian, Canton Rhubarb merely indicate the commercial channels through which Rhubarb has been derived in modern times. It is a good illustration of the obstructions which are still put in the way of the trade of India with Thibet and Western China, that if the Viceroy and Governour-General needs a Rhubarb pill, instead of getting it at once through the Himalayan passes, he receives it round about by way of Kiachta, St. Petersburg, London, and the Atlantic and Indian Oceans. The Rhubarb now obtained from Hankau is the root of *Rheum officinale*, of Baillon, a native of Mongolia, but undoubtedly the true plant, the source of the best Turkey, or Russian, Muscovite or Kiachta Rhubarb, is *Rheum palmatum*, the *Sharo-moto* of the Mongols, and *Djemtsa* of the Tangutans

The writer of the Book of Job (circa B.C. 1500) ch. xxviii, 15–19, mentions silver and gold, "the precious onyx," the sapphire, rubies, coral, pearls, "the topaz of Ethiopia," and in xxxix, 13, "the goodly wings of the peacock, and ostrich feathers." True coral is undoubtedly here meant by *ramoth*, the Hebrew word used also in Ezek. xxvii, 16, obtained from the Red Sea or Persian Gulf; and true pearls (*gabish*), either of the Persian Gulf or Ceylon. It is impossible to identify what is meant by the words we have translated as rubies [Prov. iii, 15; viii, 11; xxxi, 10; and Lament. iv, 7], and sapphires [Ex. xxiv, 10; xxviii, 18; Ezek. xxviii, 13]. By *sappir* possibly Lapis Lazuli is meant, found in many places in Central Asia, and particularly in the mines at Lajward, in Badakshan, whence its several names Lajwardi, Lazuli, L'Azure, and Azure; called also Ultramarine, because brought into Europe from beyond the sea. The rubies may be either of Ceylon or Balas rubies, which derive their name from Badakshan, Balakhsh, Balas. [Yule's "Marco Polo" 1, 149–52.] By *sappir* may also be meant Turquoises, or Turques, as called in old times, from Turkey. Ostriches are several times mentioned in the Bible by different Hebrew names, often translated by "owl" in the English version, and correctly by "ostriches" in Lament. iv, 3. In the above passage from Job the Hebrew word *renanim*, translated "peacocks," should have been ostriches, and the word *notseh*, translated "ostriches," should have been feathers—"gavest thou goodly feathers unto the ostriches." The peacocks mentioned in 1 Kings x, 22, and 2 Chron. ix, 21, along with ivory and apes, are true Indian peacocks, as is proved by the Hebrew word used for them, *tukkiyyim* being identical with the Sanscrit word *tokki* for peacocks. The Hebrew word *tukkyyim* has been also thought

to refer to Indian parrots, and whether this be so or not, the singular *tukki* possibly reappears in ψιττακὸς and σιττάκη. The Hebrew word *koph* here used for apes is also the Sanscrit *kapi*.

The gems on Aaron's breastplate enumerated in Ex. xxviii, 17–20, are in the English version named as the

Sardius, Topaz, Carbuncle,
Emerald, Sapphire, Diamond,
Ligure, Agate, Amethyst,
Beryl, Onyx, and Jasper.

It would be vain to discuss their identity, and in connexion with India it is only necessary to say that the diamond, which in the old world is exclusively an Indian production, cannot be the stone meant by the Hebrew *yahalom* [see also Ex. xxxix., 11; Ezek. xxviii, 13] and *shamar* translated "diamond" in Jer. xvii, 1; for the diamond was not known in the Mediterranean countries until after the invasion of India by Alexander the Great.

Iron is frequently mentioned in the Bible under the Hebrew name of *paldah*, which is the Arabic *fulad*, and indicates Indian iron. Tin is also mentioned, but it is impossible to say from its Hebrew name [*bedil*, Numbers xxxi., 22; Ezek. xxvii., 12; Zech. iv., 10; Isiah i., 25], whether the tin of the Eastern Archipelago or of Spain and Cornwall is meant. But Homer mentions tin, by its Sanscrit name, *kastira*, κασσίτερος [Il. xi., 25, 34; xviii., 474, 565, 574, 612; xx., 271; xxi., 592; and xxiii., 503, 561]; and the Phœnicians, who first learned the name from the trade through the Arabs with India, afterwards gave the name of Cassiterides to the Scilly Islands and Cornwall, where it still survives in Cassiter Street, Bodmin. Homer's ἕρματα τρίγληνα μορόεντα [Il. xiv., 183; Od. xviii., 298], "tripple-gemmed earrings" are supposed to be pearl earrings; and Theophrastus and the Latin writers call a pearl by its Sanscrit name, *maracata*, or μαργαρίτης and *margarita*, whence the French Marguerite, the Daisy, the pearl of green fields.

These facts prove the origin of the Indian trade with the West to be pre-historic; and it originated, through Persia, Media, Mesopotamia, Syria, and Asia Minor, with the exodus of the Aryan race from Central Asia. Probably all the main caravan routes in Asia from China northwards through Russia into Europe, and from India through Persia to the shores of the Mediterranean, follow in the general lines of the original migrations of the Aryan race westward, and of the yellow Turanian race eastward and northward, in search of food and settlements. The evidence we have of the slowness of the development of the trade with India and the East also affords a proof of its pre-historic age. The diamond was not known in Europe until after Alexander's conquests, nor Chinese silks before the time of Julius Cæsar; and of the following remarkable Indian or Eastern natural productions the greater part were first introduced into Europe by the Saracens.

Oranges and Lemons.—The Orange is derived from the wild *Citrus Aurantium*, a native of Gurwhal, Sikkim, and Khasia, and the Lemon, Lime, and probably Citron also from the wild

Citrus Limonum, a native of Sikkim and Kumaon. The word Orange is simply the Sanscrit *narunga*, Hindi *narungi*, and Arabic *narung*; and Lemon, the Sanscrit *nimbuka*, Hindi *nimbu* and *limbu*, and Arabic *limun*. The Persian and Arabian writers on drugs derive the Persian and Arabic names for the Citron, *uturuj* and *turunj*, from the Syriac *atrogha*.

PLANTAINS, *Musa Paradisiaca*, have nothing to do with *Musa* the physician of Augustus, or the Muses, the generic name *Musa* being simply the Arabic *muza*, taste.

The NUTMEG, *Myristica fragrans*, a native of the Moluccas, and MACE, derived from its kernel, were both unknown to the ancients; and Nutmeg is first unequivocally mentioned by Masudi, who visited India A.D. 916–920.

GAMBOGE, the gum resin of *Garcinia* Morella, a native of Cambogia, Siam, Cochin China, and Southern India, and Ceylon, was first introduced into Europe by the East India Company, 1615, from Cambogia. G. *pictoria*, and G. *Travancorica*, both of Southern India, also yield good Gamboge.

GAMBIER and CATECHU, *Terra Japonica*, were introduced into European commerce during last century. Gambier is the extract of the leaves of *Nauclea Gambir*, and Catechu or *Cutch* of the wood of *Acacia Catcchu*, and kernels of *Areca Catechu*, and this substance is generally called *Terra Japonica* from its once being supposed to be Japan earth.

GUM BENJAMIN, or BENZOIN, the resin of *Styrax Benzoin*, of Java, Sumatra, and Siam, is first mentioned by Ibn Batuta, A.D. 1325–49, under the name of *luban djawi* (Java Olibanum, or Frankincense), given to it by the Arab traders, and of which Benjamin and Benzoin are corruptions.

ROSE MALLOES, the Liquid Storax of *Liquidambar Altingia*, a magnificent tree of the Eastern Archipelago, derives its English name also from a corruption of the Javanese name, *rasamala*, of this exquisite perfume. In the same way the Jackass Copal of Zanzibar is so called from the Arabic *shikasi*, that is, "fresh," Copal, from the tree, which they thus distinguish from the infinitely superior half-mineralised Copal which is dug out of the ground once covered by extinct Copal forests.

CAMPHOR, produced from *Cinnamomum Camphora*, the Camphor Laurel of China and Japan, and *Dryabalanops aromatica* a native of the Eastern Archipelago, is first mentioned by Aëtius, of Diarbekr, A.D. 545, and derives its name from the Sanscrit *karpura*, through the Arabic *kafur*. Aëtius is also the first to mention Musk unequivocally, and is thought to allude to Nutmegs by his *nuces Indicæ*.

WOOD OIL, or Gurjun Balsam, obtained from various species of *Dipterocarpus*, natives of Chittagong, Tennaserim, Burma, Siam, the Eastern Archipelago, the Philippine Islands, Andaman Islands, and Ceylon, has only recently become an article of commerce.

ELEMI, the resin of an unknown tree of the Philippines, was formerly thought to be the ἔναιμον of the Greeks and *enhæmon* of Pliny, a word from which undoubtedly the word Elemi is

derived, as also the word Anime. But the *enhæmon* of the ancients Hanbury has identified with *luban meyeti*, the lemon-scented Frankincense yielded by *Boswellia Frereana*. Elemi is also yielded by other trees, natives of America and elsewhere.

KINO, the gum of *Pterocarpus Marsupium*, of Southern India and Ceylon, was first introduced into commerce within this century by the East India Company. Butea Kino is the product of *Butea frondosa*, the splendid *palas* tree of India, which gives its name to the plain on which the battle of Plassy (*palasi*) was fought.

SAPPAN, the wood of *Cæsalpinia Sappan* of the East Indies, formerly known as Brazil wood, from the colour, *braise*, or hot coals, of its wood. But when on the discovery of the Brazils a similar dyewood was found there, the name of the Indian wood was given to the new-found country and the new-found dye, and the Indian wood is now called by one of its two principal native names, the other being *bakam*. [Yule's "Marco Polo," ii., 315–16.]

BONDUC NUTS, the seeds of *Cæsalpinia Bonduc*, are first unequivocally mentioned by Ibn Baitar in the 13th century, under the name of *bunduk-hindi*, or Indian Filberts. The Saracens received filberts from Venice, and called them *bunduk*, after Venice, and these seeds being like filberts they called them also *bunduk*. Bullets and cross-bows, which they also received from Venice, they also called *bunduki*, or Venetian, and to this day bullets are called *bindiki* in Egypt; and the Hindi for a musket is *bunduk*.

TAMARINDS, from the Arabic *tamar hindi*, Indian date, are mentioned in the earliest Sanscrit writings, but among western writers are first named by Avicenna, Serapion, and Mesue. The tree *Tamarindus Indica* was once supposed to be exclusively a native of India, but is now considered to be indigenous to Central Africa also, where, however, it is not unlikely to have been introduced by the Arab immigration.

CASSIA FISTULA, the fruit of *Cathartocarpus Fistula*, first became known in Europe during the 13th century A.D.

SENNA, the leaf of *Cassia acutifolia*, and *Cassia angustifolia*, the name of which is said to be derived from Mt. Sinai, was first brought into medicinal use by the great Arabian physicians of the 9th and 10th centuries A.D.

STAR ANISE, the fruit of *Illicium anisatum* of Yunan and the south-western provinces of China, was first brought to England by sea A.D. 1588. It had previously been brought into Europe overland by way of Russia and was then called *Cardamomum Siberiense*. The fruit of *I. religiosum* is burnt as incense in the temples of Japan, and its branches are laid on the graves of the dead.

CUSCUS or Vetti-ver, the aromatic fibrous roots of *Andropogon muricatus*, used for Cuscus *tatties*, or screens, which, kept watered, diffuse a cool and fragrant perfume through Indian houses, and for fans and other ornamental small wares, is not mentioned by

any known writer. Cuscus is derived from the Persian *Khas*, and Vetti-ver is the Malyalim name.

Cocculus Indicus, the fruit of *Anamirta Cocculus*, is first mentioned by Ruellius, A.D. 1536, under the name of *Coccus Orientis*. It may be the *meizeragi* of the Arabs.

Nux Vomica, the seed of *Strychnos Nux-vomica*, is first unequivocally mentioned by Cordus A.D. 1540, although it has been supposed also to be the drug called *mechel* by the Arabs, and *Nux vomica* in the Latin translations of their works.

Sago was first brought to Europe by Marco Polo.

Soap Berries were first made generally known by the Dutch. They are the drupes of several Indian species of *Sapindus*, which, when bruised in hot water, form a detergent lather, which the natives use for washing the hair and silk. It gives the hair a very beautiful lustre. The ancients were not familiar with the use of soap except as a pomade, and used instead a number of substances from the mineral, vegetable, and even animal kingdom, and among vegetables the plant called στρυθιὸν by the Greeks, and *radicula*, and *Herba lanaria* by the Romans, and identified by some with the Gysophila *Struthium* of botanists, and by others with the *Saponaria officinalis*, both Cloveworts. The word "soap" in the English version of the Bible is the equivalent of the Hebrew *borith*, which is supposed to refer to the same plant as the στρυθιὸν of the Greeks.

Tea and Coffee.—Coffee was introduced into Europe at Venice about 1615, at Marseilles 1641, London 1652, and Paris 1657. In 1688, Ray observes that London might rival Grand Cairo in the number of its coffee-houses. It was in use in Persia A.D. 875, and Avicenna fully describes it *circa* A.D. 1000. Tea was introduced into Europe at the end of the 16th and beginning of the 17th century A.D. It is first mentioned (except of course by the Chinese) in an Arabian itinerary [Renaudot, "Anciennes Relations"] of the 9th century A.D.

Sugar was introduced into general use in Europe by the Saracens, and through the Crusades. It is incredible that it was not known to the ancients, as Salmasius, Sprengel, and Fee maintain. They knew honey and date sugar (the *jaggeri* of India) of course, but Salmasius asserts that the σάκχαρ, σάκχαρον, or σακχάριον, of the Greeks and the Latin *Saccharon* was not sugar but *tabashir*, the silicious deposit found in the joints of Bamboos, "beyond all controversy." One would think that Pliny's description left no room for doubt, yet Salmasius by changing a comma alters its whole meaning. Pliny says, "Saccharon et Arabia fert, sed laudatius India, "est autem mel in arundinibus collectum, gummium modo candi- "dum, dentibus fragile, amplissimum nucis avellanæ magnitudine, "ad medicinæ tantum usum." But, says Salmasius, "Ita hæc dis- "tinguenda, *collectum gummium modo*, non ut est vulgo, *gummium* "*modo candidum*. Hæc omnia prorsum quadrant in tabascir, vel "saccharum mambu."

Dioscorides says that σάκχαρον is a concrete honey, found in reeds in India and Arabia, in consistence like salt, and brittle between the teeth like salt, and dissolved in water it is agreeable

to the stomach. It is absurd to suppose that Dioscorides' description can apply to flint stones like Tabashir, or to anything but sugar: or Lucan's [A.D. 65] well known line—

Quique bibunt tenera dulces ab arundine succos,

to anything but the Sugar Cane. The Bamboo is certainly not a "tenera arundo." It is evident, however, that it was very little known to the ancients, and that Pliny, copying transparently from Dioscorides, probably confused it with Tabashir, as he confuses the peach (*Persica*) with the Persea. I would place a full stop after "India," as if Pliny, on mentioning sugar, at once dismissed a subject so familiar through date sugar and honey, and then went on to describe in detail so unfamiliar a substance as Tabashir—Est autem mel, &c.

Besides, all the European names for sugar are derived from the Sanscrit *sharkara* through the Arabic *shakar*, the Hindu name of sugar, but in no language in India of *tabashir*. Yet the popular names in India for sugar are for the coarser kinds *chini*, that is Chinese, and for the finer *misri*, that is Egyptian. Undoubtedly sugar was made from time immemorial in India, but probably not in a perfected state, but in the form of *gula*, by which Hindu name sugar is known throughout the Indian Archipelago. The Arabs are known to have first taught the Chinese to crystallise sugar, and they themselves carried its refining in Egypt, in the middle ages, to great perfection. The first undeniable mention of sugar by western writers is by Moses Choronensis in the 5th century A.D.: but if, in spite of the arguments of Salmasius, we accept the conclusion of common sense that the Greeks and Romans really knew cane sugar, we shall at once recognise much earlier allusions to it than even the descriptions of Pliny and Dioscorides. Nearchus, quoted by Strabo [xv. 1, 20], says that in India "reeds yield honey, although there are no bees." Eratosthenes, also quoted by Strabo, speaking of the plants of India, says: "The roots of plants, particularly of large reeds, possess a "sweetness which they have by nature and by coction; for the "water both from rains and rivers is warmed by the sun's rays." Varro also, B.C. 68, a writer on agricultural and rustic subjects, in a fragment preserved by Isidorus, evidently alludes to cane sugar. Arrian, in the "Periplus of the Red Sea," enumerates amongst the imports at Opone, one of the East African ports, "honey in reeds, called *saccharon*." Ælian, about the same time in his Natural History of Animals, speaks of a kind of honey, which was pressed from reeds that grew among the Prasii, a people that lived near the Ganges. Alexander Aphrodisiensis, A.D. 212, says, "that what the Indians call sugar, was a concretion of "honey in reeds, resembling grains of salt, of a white colour, and "brittle." This is simply the description of Dioscorides, which, while it confirms the conclusion that Dioscorides knew cane sugar, proves also that even down to the third century A.D. it was still very little known. Moses of Chorene, [Geogr. p. 364] describes the sugar cane as he saw it growing in his time on the banks of the Euphrates. The next mention of sugar is by the Arab writers, Abusadi in the ninth century, quoted by Renandot, Abulfeda,

Edresi, and Ebn Alvam of Cordova, quoted by Sprengel; and by the historians of the Crusades. They found the plant everywhere in Syria, Sicily, and Africa, (introduced by the Arabs), and describe it under the name of *Cannameles* and *Callamelum*. About A.D. 1420, the Portugese carried the cultivation of the cane from Sicily, to Madeira, and the Spaniards shortly afterwards to the Canary Islands. In 1506 it was carried to St. Domingo. The Dutch first introduced the manufacture of sugar into Brazil. The English did not make it at Barbadoes until 1663. Thus the Arabs spread its cultivation and manufacture throughout the Mediteranean countries, and the Spaniards, Portugese, Dutch, English, and French throughout tropical America. Sugar-candy is the Arab *shakarkhand*, and Barley sugar the French *Sucre brulé*. Caramel is said to be derived from carob-sugar [*Ceratonia Siliqua, Algaroba* bean, or St. John's Bread, Locust], mediæval writers enumerating three kinds of sugar, *mele di ape, melc di canna*, and *mele di carrubo*. But possibly Caramel is really a corruption of *Cannameles*.

We often see the Aloe, Cactus, Maize, and even the Pine-apple, introduced by artists in their pictures of ancient life and history. They are all American plants. The ancients of course knew only the Aloes of Socotra, which is produced by a very different species from the American Aloe, always figured by these artists, simply because it has spread in modern times with the Cactus and Maize all through the Mediterranean countries and India. Tobacco and Chilies, the Earth-nut, Cashew-nut, Guava, and Custard apples now found everywhere in India, and popularly supposed to be natives of India, are also all natives of America. Most of them were introduced by the Portuguese, who with the Arabs must rank amongst the greatest benefactors of mankind, in diffusing the fruits and grains of different countries throughout the world. India and Africa owe the Maize and Tapioca entirely to the Portuguese. The introduction of the Custard apple in the Ajunta Cave paintings is an extraordinary example of anachronisms in pictures. These paintings are, I believe, dated by Mr. Fergusson not later than the 7th or 8th century A.D. The Custard apple could not have been introduced into India until the beginning of the 16th century A.D., yet the fruit represented in the paintings is undoubtedly the Custard apple, and it is represented over and over again. The probable solution of the enigma is that it is a misrepresentation of the Jack fruit [*Artocarpus integrifolia*], which is so profusely portrayed on the Bharhut sculptures.

There is an unidentified fruit represented on the sculptures of Assyria which has been conjectured to be the Pine-apple. It is figured in Rawlinson's "Ancient Monarchies," Ed. 1864, vol. ii. 912. Whatever it may be, it certainly cannot be the Pine-apple, which has not been known in the old world for more than a century. I believe it to be a branch of dates conventionally represented, as on the date *Hom*.

The persistence of the classical names of vegetable productions, derived through the Arabian writers, in the East is most

remarkable. In the most outland bazaars of Western India we find:—

Opium - -	under the name of		*afium.*
Cherries - -	„	„	*jirasya.*
Liquorice - -	„	„	*asalasus.*
Caraways - -	„	„	*carwiya.*
Cumin - -	„	„	*kimun.*
Camomile, [ἀνθεμίς]	„	„	*atnamis.*
Mandragora -	„	„	*mirdangiya.*
Hyssop - -	„	„	*zufi yiabas.*
Lavandula Stœchas	„	„	*ustakhudas.*
Salvia - -	„	„	*salbia.*
Plantago, [ψύλλιον]	„	„	*fusliun.*
Laurel, [δάφνη] -	„	„	*zafni.*
Mezereum -	„	„	*maziryun.*
Hemp, [κάνναβις] -	„	„	*kinnub.*
Scolopendrium -	„	„	*iskulikundriun.*
Dryopteris -	„	„	*dunditaras.*
Pteris - -	„	„	*sarkhas* and *bitaras.*
Polypodium -	„	„	*bulukinbun.*
Polytrichum -	„	„	*bulutingin.*

In Bombay the name πετροσέλινον has been transferred from Parsley to the seeds of *Pangros pabularia*, *fiturasulium*, but in Bengal the native butlers still call Parsley *Peter-silly*, but through the Dutch, not the Arabs. Sometimes in the case of substances having two Latin or Greek names, one is corrupted and the other translated. Thus, *Behen album* becomes *safaid bahman*, White Behen, and *Behen rubrum*, *Lal-bahman*, Red Behen, and literally white and red Brahmin. These surprises, of daily, of almost hourly occurrence, make one of the charms of life in India.

The Vine, Pomegranate, and *Soma*, although not directly connected with the development of the Indian trade, are three famous Eastern plants, the history of which cannot be overlooked in noticing a collection of Indian vegetable productions. The Pomegranate, the *Punica Granatum* of botanists, is a native of North-western India, whence it was carried by the earliest Aryan emigrations into Media and Syria, and afterwards by the Phœnicians and Carthaginians, from whom its Latin name, *Punica Granatum*, was derived, just as the Greek and Latin name of the Date Palm, φοῖνιξ, Phœnix, was derived from the Phœnicians, into all the countries of the Mediterranean. Later the Saracens and the Portuguese naturalised it throughout the northern sub-tropical zone in the old world and the new. It is constantly represented on the sculptures of Assyria and Egypt, with grapes and peaches, and is frequently mentioned in the Bible [Ex. xxviii. 33, 34; xxxix. 24–26; Numb. xiii. 23; xx. 5; Deut. viii. 8; 1 Kings, vii. 18; Song of Sol. iv. 3, 13;], its Hebrew name being *rimmon*, from which the Arabic *rumman* is derived, and the name also of several places in Palestine. Rhodes derives its name from ῥόδον, the ancient Greek name of the flower, afterwards called βαλαύστιον. Its vermilion blossoms, and handsome fruit, were sacred to Venus,

and to the Syrian God Rimmon. The Vine [Gen. ix. 20; Numb. xiii. 23; Song of Sol. i. 14; Isa. xvi. 8–10; Jer. xlviii. 32, 33; Ezek. xxvii. 18; Hos. xiv. 7] is indigenous to the Caucasus, from the slopes of which it must have spread with the migrations of the Semitic and Aryan races into all the dry, serene countries of the Mediterranean Sea, the lands of the Almond and Fig, Cypress and Pomegranate,—

> "Where the pale Citrons grow,
> The golden fruits in darker foliage glow,
> Soft blows the wind that breathes from that blue sky,
> Still stands the Laurel and the Myrtle high."

The *Soma*, *Sarcostigma brevistigma*, the renowned *som* of the Vedas, and *hom* of the Zendavesta, is indigenous to the Punjab and Bolan pass, Candeish, and the Ghats of Western India and Coromandel coast; and from the sacred rites and rejoicings which accompanied the drinking of its fermented sap in Vedic times, and which are still celebrated among the Brahmins of India, it evidently was the first intoxicant discovered by the Aryan race. The division between the Indian and Persian Aryas was the result of a dispute over the use of *soma* as a religious service, particularly in the ceremony which symbolised the intoxication of the Gods, which the Persians resolutely resisted. In the Caucasus mountains and Armenia the use of *soma* gradually passed into the use of wine [Gen. ix. 21], a fact which suggests an explanation of the Indian origin of Bacchus, and of the Dionysiac rites of ancient Greece. In the valley of the Tigris and Euphrates, the sap of the Date palm, particularly, was substituted for that of the *som*, or *hom*, as an intoxicating drink. There is a verse in the Rig Veda, ix., celebrating the virtues of *soma*, a finer Bacchic burst than is to be met with among the most enthusiastic of the poets who have sung of Wine:—"The purifying *soma*, like the sea, "rolling its waves through my heart, has poured forth songs, and "hymns, and praise."

THE ROUTES OF INDIAN COMMERCE.

The Caravan Routes.

The earliest trade between the East and West was carried on by caravans, and, long after the sea routes by the Red Sea and Persian Gulf began to be used, the land trade continued to be more important than the sea-borne. The earliest of these caravan routes were those between Egypt, Arabia, and Assyria, and the first notices we have of them are in the Bible. In Gen. ii. 11,-12, we are told, of the land of Havilah, that there was gold there, and bdellium and the onyx stone. Havilah is in Arabia Felix to the north of Ophir, and the passage simply indicates the route through which the Bdellium or Musk of India was received in Egypt in the time of Moses. The passage, Psalm xlv. 8, "All thy gar-" ments smell of myrrh, aloes, and cassia, out of the ivory palaces, " whereby they have made thee glad," is generally supposed to allude to the tablets and alabastra, or scent bottles, in which perfumes were kept in ancient times. But it may also be translated "Out of the ivory palaces of the Minæans," a people of Arabia Felix, who, like their neighbours, the Sabæans, and the Gerrhæans on the Persian Gulf, were the chief carriers of the Indian trade, and renowned in all ancient times for their fabulous opulence and luxury. In Gen. xxxvii. 25, we read that the sons of Israel sat down in Dothan to eat bread, "and they lifted up their eyes, " and looked, and behold a company of Ishmaelites came from " Gilead with their camels, bearing spicery (Gum Tragacanth), " and balm (produced by *Balsamodendron Opobalsamum* and " *Gileadense*), and myrrh, going to carry it down to Egypt," and that as the "Midianites, merchantmen" passed by, "his brethren" " sold Joseph to the Ishmaelites," who were probably travelling by the immemorial caravan route, through Canaan and Edom and Midian, from Chaldæa into Egypt, the route by which Israel afterwards sent his sons into Egypt with balm and honey, spices and myrrh, nuts and almonds, for a present to "the man," their brother, who was now Governor over the land. Many beautiful and sublime scripture images are taken from this trade, as in Isaiah lxiii. 1, " Who is this that cometh from Edom with dyed garments from Bozrah?" and in the Song of Solomon iii. 6, "Who is this " that cometh out of the wilderness like pillars of smoke, per-" fumed with myrrh and frankincense, with all powders of " the merchant? * * * they all hold swords, being expert " in war, every man hath his sword upon his thigh, because of " fear in the night;" passages giving also a vivid picture of a Mecca caravan of the present day, and of the dangers besetting it, with its rich merchandise of China, India, and Persia.

As we learn from the account of the wars, both of Moses and of Gideon with the Midianites, they were a very wealthy Arab people, living partly by predatory incursions into the neighbouring territories, and partly by carrying on a caravan trade, across

the intervening deserts, with the powerful states of Egypt and Chaldæa.

There was an immemorial commerce between India and the nations of the Mediterrancan, and of the three principal routes it in different ages followed, that by Kirman, Gerrha, and Petra was probably the oldest of all. There was no other route between India and Europe where so small a space of sea had to be traversed, and the coast of Arabia is visible over the Straits of Ormuz from Kirman. The produce of India came to Kirman and Ormuz, and was thence carried across the Persian Gulf to Gerrha, the emporium of the pearl fishery still carried on among the Bahrein islands, the ancient Tylos and Aradus, which, with Muscat, were the original seats of those seafaring Arabs, who afterwards established themselves in Phœnicia, and carried their settlements from port to port along the eastern, southern, and western shores of the Mediterranean from Tyre and Sidon to the coasts of Mauretania, and Andalusia. The Indian caravan routes extended across the peninsula from Masalia, now Masulipatam, by Tagara, now Dowlatabad (Deoghir), and Barygaza, now Baroach, to Pattala, now Tatta, on the Indus. Pattala was in communication with the great port of Barbarike, at the mouth of the Indus, and with Taxila in the Punjab, the Takhsasila of the Hindus, and evidently represented by the vast ruins surrounding the modern Manikyala. It was near this city that Alexander crossed the Indus, at the ford where the Emperor Akbar, A.D. 1581, built the fortress of Attock, "the Limit" or "Barrier;" and it was a place of great importance, as the point at which all the caravan routes in India and leading into India converged: for the route from Pattala was here joined by one from Palibothra, the modern Patna, the continuation of a line from China across the Himalayas; and here, also, the different lines from Seres or China, through the Cashmere valley, and from Sarmatia [now Russia], Media, and Mesopotamia, through the Bamian and Kyber passes first entered India. There was another route from Carmania (Kirman) through the Bolan pass, connected with the route between Taxila and Pattala. The Indian caravan traders appear to have known nine routes through Afghanistan and Baluchistan to Herat and Candahar, where they fell in with the roads leading to Ecbatana, or to Persepolis and Shushan, according as their destination was the northern portion of Mesopotamia and Asia Minor, or the southern. Besides Barbarike, Barygaza, Musiris and Masalia became great places of export, when once the sea was opened to the trade of India.

The caravan trade which the Arabian merchants of Gerrha and Sabæa collected at Petra, the Edomites, or Idumæans, or Nabatæans, as they are later called, carried thence into Egypt and Canaan, and the Phœnician Arabs distributed round the shores of the Mediterranean. Their chief cities, Sidon and Tyre and Tarsus, rapidly became great. Sidon and Tarsus must have first risen into notice. Homer does not mention Tyre, but he constantly alludes to, and describes the metal work, jewelry, and other art wares of Sidon [Il. vi. 290–291; xxiii. 743; Od. iv. 84, 618; xiii. 285; xv. 118, 424.] In the xvi. Book of the Odyssey he

gives an exact description, of inestimable value, of the first meetings of the Greek farmers with the Phœnician merchants on the coasts and among the islands of ancient Greece; and of the manner in which the Phœnicians conducted their early trade in the Ægean Sea.

> " Freighted, it seems, with toys of every sort,
> A ship of Sidon anchored in our port,
> What time it chanced the palace entertained,
> Skilled in rich works, a woman of their land.
> * * * * *
> *A year they traffick, and a year they load.*
> Their stores complete, and ready now to weigh,
> A spy was sent their summons to convey."
> " *An artist to my father's palace came*
> *With gold and amber chains, elaborate frame:*
> *Each female eye the glittering links employ,*
> *They turn, review, and cheapen every toy.*
> He took the occasion, as they stood intent,
> Gave her the sign and to his vessel went.
> She straight pursued, and seized my willing arm;
> I follow'd, smiling, innocent of harm.
> * * * * *
> Arriving then, where tilting on the tides,
> Prepar'd to launch, the freighted vessel rides,
> Aboard they heave us, mount their decks, and sweep
> With level oar along the glassy deep."

The rape of Io by the Phœnicians, those of Europa and Medea by the Greeks, and that of Helen in the next generation, all clearly shew that from the beginning the famous merchant princes of Tyre and Sidon were notorious among their neighbours for piracy. The prophet Joel, in the 8th cent. B.C., the great period of the maritime ascendency of the Phœnicians in the Mediterranean, long before Herodotus, and only a little later than Homer, bears testimony to the same fact, when [chap. iii., v. 3 to 8], in denouncing God's judgments against the enemies of Judah and Jerusalem, he writes: "And they have cast lots for " my people, and have given a boy for an harlot, and sold a girl " for wine that they might drink. Yea, and what have ye to do " with me, O Tyre and Sidon, and all the coast of Palestine? " * * * The children also of Judah and Jerusalem have ye sold " unto the Grecians, * * * and I will sell your sons and your " daughters into the hand of the children of Judah, and they " shall sell them to the Sabœans, to a people far off, for the Lord " hath spoken it." This quotation proves also how greatly the system of barter prevailed in this primitive commerce of the Phœnicians and Greeks, a practice which Homer has described with great minuteness, Il. vii. 467–475:—

> " And now the fleet, arrived from Lemnos sands,
> With Bacchus' blessings cheer'd the generous bands.
> Of fragrant wine the rich Eunœus sent
> A thousand measures to the royal tent;
> Eunœus, whom Hypsipyle of yore
> To Jason, shepherd of his people, bore.
> The rest they purchas'd at their proper cost,
> And well the plenteous freight supply'd the host:
> Each, in exchange, proportion'd treasures gave:
> Some brass, or iron; some an ox, or slave."

The Phœnicians of Tarsus finding abundance of wood close at hand in Mount Taurus, the excellence of their ships gave them for a long time the pre-eminence in the navigation of the Mediterranean, and passed into a proverb. This seems to be the simple explanation of the expressions "ships of Tarshish" and "navy of Tarshish" so often occurring in the Bible, which still puzzle many people, who suppose that ships trading with Tarshish in Spain are meant. Milton's picture of "a ship of Tarsus" may be fitly hung beside Homer's of "a ship of Sidon:

> "A stately ship
> Of Tarsus, bound for th' isles
> Of Javan or Gadire,
> With all her bravery on, and tackle trim,
> Sails fill'd, and streamers waving;
> An amber scent of odorous perfume
> Her harbinger."

Homer's description of the first attempts of the Greeks to trade in the Mediterranean is another proof how commerce, in its beginnings, is little better than piracy; indeed it is very slowly that men discover that it is more profitable to get what they want by peaceful means than by violence and robbery and war; and still longer does it take them to learn the value of honest dealing in trade. In the xvii. Book of the Odyssey the Greeks, who were not then so civilised as the Sidonians, are described as running up the mouths of the Nile, landing, ravaging the villages and towns of the Delta, within reach, and rapidly retreating to their ships with their booty.

> "By Egypt's silver flood, our ships we moor;
> Our spies commission'd straight the coast explore,
> But impotent of mind with lawless will
> The country ravage, and the natives kill.
> The spreading clamour to their city flies,
> And horse and foot in mingled tumult rise.
> * * * * *
> Jove thunder'd on their side: our guilty head
> We turn'd to flight."

Thus the Greeks began, as the Arabs before them, plundering where they dared, and, where this was impossible, trafficking, until they were gradually changed from wandering pirates into wealthy merchants, and public-spirited and patriotic citizens, and Athens became the mother of arts and eloquence.

Four hundred years after the time of Homer, Miletus, the Queen of the Ionian cities, had become the rival of Tyre, and with her colonies at Cyzicus, Sinope, Tanais, Olbia, and Miletopolis, the modern Cherson, monopolised the Asiatic trade through Asia Minor and the Black Sea. Though Miletus was destroyed on the suppression of the Ionian revolt, it rapidly regained a considerable portion of its old importance, until the conquests of Alexander the Great and the foundation of Alexandria, ruined its commerce for ever.

The Persian Gulf Route.

The first reference we have to the trade by the Persian Gulf is in the Bible, in 2 Chron. viii. 4, where it is written

that Solomon built "Tadmor in the wilderness, and all the "store cities which he built in Hamath," by which he hoped to divert a portion of the Persian Gulf trade to Jerusalem. It was through this trade that Nineveh and Babylon, Seleucia, Ctesiphon, Al Modayn, Bussora, and Baghdad, in succession, rose to empire in the valley of the Tigris and Euphrates; and it was this trade which chiefly contributed to the power of Tyre when at the height of her greatness and fame. From the cities of the Tigris and Euphrates, the produce of China, India, Persia, and Arabia, was carried by Tadmor and by Hamath and Damascus, into Canaan, and Edom, and Egypt. This line supplied also Tyre and Sidon, to which there was a more northerly route also by Emesa and Heliopolis or Baalbec. Another line led north-west by Chalcis and Berœa, and through the valley of the Orontes to Haleb, or Aleppo, and Antioch, and Seleucia, now Suadeia, and thence, over Mount Taurus through Asia Minor, to the cities on the Ionian coast. These were also in communication with Assyria by a more easterly route, connected with that leading between the Black Sea and the Caspian Sea, over the Caucasus into Sarmatia, which again was quite distinct from that leading from Sarmatia beyond the Sea of Aral to Bactriana and India. The trade of Tyre is described by Ezekiel with the greatest accuracy, and is the fullest account we possess of the commerce of the old world about B.C. 600. Tyre is represented, in chapter xxvi., as rejoicing against Jerusalem.—"Aha, she is broken that was "the gates of the people, she is turned unto me: I shall be "replenished now she is laid waste." "Therefore," says Ezekiel, "thus saith the Lord God; Behold, I am against thee, O Tyrus, "and will cause many nations to come up against thee, as the "sea causeth his waves to come up, and they shall destroy "the walls of Tyrus, and break down her towers. I will also "scrape her dust from her, and make her like the top of a rock. "It shall be a place for the spreading of nets in the midst of "the sea:" and then, in the next chapter, the prophet goes on to describe the trade of Tyre, a description which freshens one in reading it like a walk in the face of the sea breeze on the Cannebiere, among the shipping round the old port of Marseilles. Among other imports are enumerated ivory, and ebony, "emeralds," purple, and broidered work, fine linen, and coral, and agate, bright iron, cassia, and calamus, precious cloths for chariots, precious stones and gold: and Haran, and Canneh, and Eden (Aden); the merchants of Sheba, Asshur, and Chilmad were her merchants "in all sorts of things, in blue clothes and broi-"dered works, and in chests of rich apparel bound with cords, "and made of cedar, among thy merchandise." This is completely an Indian trade, as is still more clearly seen in the literal translation of the chapter by Michaelis. The trade of Babylon, as described in the Book of the Revelation, ch. xviii, about A.D. 100, is the same trade still between Bombay, the Persian Gulf, and East African coast—"the merchandise of gold and silver, and precious "stones, and of pearls, and fine linen, and purple, and silk, and

" scarlet, and all thyine wood, and all manner of vessels of ivory,
" and all manner of vessels of most precious wood, and of brass,
" and iron, and marble, and cinnamon, and odours, and ointments,
" and frankincense, and wine, and oil, and fine flour, and wheat,
" and beasts, and sheep, and horses, and chariots, and slaves."

After the destruction of Tyre and Jerusalem by Nebuchadnezzar, and the subjugation of Egypt by Cambyses, Babylon monopolised the trade of India; but, when the Medo-Babylonian Empire was overthrown by Cyrus, the trade returned to Tyre, and Tyre again rose to greatness, until a second time destroyed by Alexander; and again, through the encouragement of the Euphrates valley trade by the Seleucidæ the Parthian Arsacidæ, and Persian Sassanidæ, and of the Red Sea trade by the Ptolemies, Tyre recovered itself, until destroyed a third time by the Crusaders A.D. 1124. Babylon was succeeded by Seleucia under the Seleucidæ, and by Ctesiphon under the Parthians, and Al-Modayn, as the twin cities were now called, under the Sassanidæ. Abulfeda's account of the sack of *Al-Modayn* by the Saracens simply repeats the account given in the Book of the Revelation of the merchandise of Babylon,—purple, and royal apparel, and broidered garments, costly furniture, and hangings, and carpets, silk, and precious stones, and gold, and silver, and camphor, and frankincense, and spices. Under the Saracens, Bussora, founded by the Caliph Omar, A.D. 635, and Baghdad, founded by Al Mansour, about A.D. 762, almost rivalled the fame of Babylon and Nineveh. When the Caliphs fell, these towns were repeatedly taken and retaken by the Turks and Persians and gradually fell into decay; and when the Portuguese occupied Ormuz A.D. 1508, the Persian Gulf Indo-European transit trade was finally extinguished. But, by this route, India had been in communication with Europe for more than three thousand years, and through the Greek colonies on the Ionian coast and the Milesian colonies in the Black Sea, their intercourse by the Persian Gulf was far more close and continuous than by the Red Sea; and from the time of the Persian invasions of Greece and Alexander's conquests, to the first attacks of the Saracens on the Eastern Empire, the intercourse between Europe and India, through Egypt, through Syria and Mesopotamia, and through Asia Minor, and by Bayazid through Persia, was most intimate and familiar. The importance of the Persian Gulf route in ancient times is very significantly shewn by the fact that the Greeks and Romans should have continued, even after the voyage of Scylax, and down to the time of Ptolemy Euergetes and Claudius Cæsar, to believe that by sea India could be reached only by way of the Euphrates valley and Persian Gulf. Its importance is not understood so fully in Europe as in India. From Europe India seems far off indeed, but Europe appears much closer from India, as, in fact, the next peninsula beyond Arabia; the valley of Mesopotamia seems, through the Straits of Ormuz, to be at the very doors of India; and it is felt, that in a commercial, political, and æsthetical sense, the Tigris and Euphrates flow into Bombay Harbour and the other ports of Western India. We shall never

understand the arts of India properly if we overlook these patent physical and historical facts, which have become obscured only through the Portuguese discovery of the Cape route, and the neglect of the Tigris and Euphrates valley route under Turkish rule.

The Armenians, moreover, continued the local trade they had always carried on, from the earliest ages, between Persia and India; and at present there are not less than five thousand Armenians, in India, engaged in this trade.

The Red Sea Route.

The earliest notices of the Red Sea route are in the Bible, 1 Kings, ix. 26–28:—"And King Solomon made a navy of ships in "Ezion-geber, which is beside Eloth, on the shore of the Red Sea, "in the land of Edom; and Hiram sent in the navy his servants, "shipmen that had knowledge of the sea, with the servants of "Solomon; and they came to Ophir, and fetched from thence "gold." And 1 Kings, x. 11, 22:—"And the navy also of "Hiram, that brought gold from Ophir, brought in from Ophir "great plenty of almug trees, and precious stones." "Once in "three years came the navy of Tarshish (as we might say, 'the "Indiamen'), bringing gold and silver, and ivory, and apes and "peacocks." In 2 Chron. ii. 8; viii. 17, 18; and ix. 10, 11, 21, we have similar notices of this trade. The ships of Solomon and Hiram did not sail direct to India; it was a thousand years more before the Arabians first learned to strike direct across the Indian Ocean by the monsoons between India and Arabia.

Solomon and Hiram were nearly contemporary with Homer, and we have seen from Homer that the Phœnician trade of the Mediterranean was at that time a coasting trade, and how a year was spent in one place trafficking and loading. Solomon's ships would take a year in reaching Ophir, which is placed south of Havilah, and in fact near Aden, and a year in trafficking and loading there, with almug wood, and apes and peacocks from India, and ivory from Africa, and gold, "the gold of Ophir" and "Havilah," from Nubia, which derives its name from *noub*, gold, and is "the Land of Gold," compassed by the River Gihon, or Nile. Indian gold also was doubtless included in the gold of Ophir, that is, transmitted by the merchants of Ophir, and even in "the gold of Havilah," for it was celebrated from the earliest times, and from its Sanskrit name *sona* comes the German and English name of the sun. In India the moon is called *chand*, and silver *chandi*, and so with us nitrate of silver is "lunar caustic." The "Gold of Parvaim" [2 Chron., iii. 6], with which Solomon's Temple was "garnished," would certainly include Indian gold, if Parvaim is really the Sanscrit *purva* or "East," signifying the countries of the East generally.

Solomon's object in establishing a port at Ezion-geber was to share with Elath (Elana) and Edom (Petra) the profits of the Indian trade, and, through his alliance with Hiram, he shared also the profits of its transit through Judah and Israel, the merchandise of the East having previously always been shipped to Tyre

from Rhinocolura, the frontier town at the mouth of the brook *e Arish*, "the river of Egypt," which marked the boundary between Egypt and Canaan. These friendly arrangements between Solomon and Hiram would in fact seem to have been established on the basis of a formal commercial treaty. Solomon agreed to furnish Hiram [2 Chron. ii., 10] with 640,000 pecks of "beaten wheat," 640,000 pecks of barley, 1,500,000 gallons of wine, and 1,500,000 of olive oil; and also to cede to him [1 Kings, ix. 11, 13] "twenty cities in the land of Galilee," "Galilee of the Gentiles," or "strangers," one of the richest and most beautiful districts of Palestine; of which we are told, that when Hiram came out of Tyre to see them, they pleased him not: "And he "said, What manner of cities are these that thou hast given me, "my brother? And he called the land Cabul [*i.e.*, 'dirty' or "'shabby'] until this day." In return Hiram sent Solomon "six talents of gold," and master craftsmen, "to cut timber on "Lebanon," and to prepare it for the "great and wonderful" temple which he was building, and pilots to assist him in the direct trade he desired to open with Ophir. In these transactions we perceive the relations that would naturally grow up between a manufacturing and maritime, and a pastoral and agricultural people; out of which also, as has been shewn, the first intercourse of the Phœnicians with the Greeks arose. Hiram's letter to Solomon affords us almost as vivid a description of such a commerce as the contemporary story of Eumæus in the Odyssey, and in greater detail: "Then Huram the King of Tyre answered in writing, "which he sent to Solomon. And now I have sent a cunning "man, endued with understanding, of Huram my father's, the son "of a woman of the daughters of Dan, and his father was a man "of Tyre, skilful to work in gold, and in silver, in brass, in iron, "in stone, and in timber, in purple, in blue, and in fine linen, "and in crimson; also to grave any manner of graving, and to "find out every device which shall be put to him, with thy cun-"ning men and with the cunning men of my Lord David thy "father. Now, therefore, the wheat, and the barley, the oil, "and the wine, which my lord hath spoken of, let him send "unto his servants, and we will cut wood out of Lebanon as "much as thou shalt need; and we will bring it to thee in "flotes by sea to Joppa; and thou shalt carry it up to Jeru-"salem." These arrangements, however, did not long survive the death of Solomon. "The ships in Ezion-geber," we read, "were broken, that they were not able to go to Tarshish," in the reign of Jehoshaphat, circa B.C. 896–889; but the rivalry between Jerusalem and Edom, or "Mount Seir," continued to find striking expression in the Bible throughout the whole period of prophetic development among the Hebrews, as in Isaiah xxxiv. 5, 6: "For my sword shall be bathed in heaven: "behold, it shall come down upon Idumea. . . . . For "the Lord hath a sacrifice in Bozrah, and a great slaughter "in the land of Idumea." And Jeremiah, xlix. 13–22, "Bozrah shall become a desolation, a reproach, a waste, and "a curse. . . . Thy terribleness hath deceived thee, and the pride

" of thine heart, O thou that dwellest in the clefts of the rock, " that holdest the height of the hill: though thou shouldest make " thy nest as high as the eagle, I will bring thee down from " thence, saith the Lord. Also Edom shall be a desolation: " every one that goeth by it shall be astonished, and shall hiss at " all the plagues thereof. . . . The earth is moved at the noise of " their fall, at the cry the noise thereof was heard in the Red " Sea." And in Ezekiel, xxv. 13, 14; and xxxv. 15, " As thou " didst rejoice at the inheritance of the house of Israel, because " it was desolate, so will I do unto thee: thou shalt be desolate, " O mount Seir, and all Idumea, even all of it;" and Amos i. 10–12, " I will send a fire on the wall of Tyrus, which shall " devour the palaces thereof. . . . I will send a fire upon Teman, " which shall devour the palaces of Bozrah."

Rameses-Sesostris, who cut the canal between Memphis, Bubastis and the Red Sea, also sent an expedition against the Idumæans, whose country, Nabatæa, as it was called in later times, was believed by the classical writers to be the source of all the precious commodities of India and the East, as Ophir was supposed to be by the writers of the Old Testament. The Canal was cut to divert the trade of the Red Sea exclusively to Egypt. Necho, who sent a Phœnician expedition round Africa, began to reopen the canal, and, 70 years later, Darius, son of Hystaspes, who sent the expedition of Scylax from the Indus into the Red Sea, tried to complete Necho's project, but was forced to abandon it. Ptolemy Philadelphus reopened it for 37 miles from Bubastis to the Bitter Lakes, when it was stopped short owing to the supposition that it was several feet below the Red Sea, and if completed, would inundate the delta of the Nile with salt water. The Arabs themselves always preferred to land their Indian goods for Egypt as far south on the African coast as possible, in order to avoid the strong head winds which blow down the Red Sea for nine months in the year, and with which little vessels could not safely contend. Thus in the most ancient times, they landed them on the coast at Cosseir, and thence transported them to Thebes, reputed the oldest city in the world, the fame of whose splendour, as the capital of Egypt, and chief seat of the worship of Ammon,—" great city of Zeus," " Diospolis Magna,"—had already reached the Greeks in the time of Homer. Ptolemy Philadelphus built the new port of the Troglodytic Berenice (which gave its name to varnish), 200 miles south of Cosseir, and thence the bales of Indian merchandise were transported, past the Smaragdus mountains, from which the *Smaragdus*, or emerald, took its name, to Coptus, on the Nile, 20 miles below Thebes. By another route they were brought to Myos Hormos (" Harbour of the Mussel," so called from the Pearl-mussel found there), at the mouth of the Gulf of Suez, and transported thence, between the Alabastrites and Porphyrites Montes, which give their names respectively to alabaster and porphyry, to Arsinoe, on the Nile; and, by a third route, they were sent by Arsinoe or Cleopatra (also built by Philadelphus), now Suez, at the head of the Gulf of that name, across the desert to a

station on the Nile north of Memphis, which afterwards became Grand Cairo. Ptolemy Philadelphus built also the lighthouse on the island of Pharos, and, desiring to extend the trade of Egypt, and stimulated by the fame of the voyage of Nearchus from the Indus to the head of the Persian Gulf, sent Dionysius through Persia into India, where he arrived soon after the time that the embassy of Megasthenes from Seleucus was there, and wrote the report on that country already noticed.

Carthage had grown great in the trade with Egypt, and, while she was carrying on her deadly struggle of a hundred years (B.C. 264–146) for the empire of the world with Rome, Rhodes in its turn rose to greatness, and it was during this period that, owing to the confusion into which the Persian Gulf route was thrown through the quarrels of the successors of Alexander in Syria, Egypt for a time commanded the monopoly of the trade with India, and reached the height of her commercial prosperity under the Ptolemies. But the trade was still a coasting trade, as we may infer from Virgil's account of the wanderings of Æneas before he reached Latium, and as is still more plainly shewn by St. Paul's memorable voyage to Rome [Acts xxvii.–xxviii.] St. Paul, with his fellow-prisoners, was put, at Cæsarea, into a ship of Adramyttium, now *Adramyti*, the Thebe of Homer, a city on the Ionian coast, formerly of great trade. The next day they touched at Sidon, and when they had launched from thence, sailing under Cyprus, because the winds were contrary, they came to Myra, a city of Lycia. And there the centurion, finding a ship of Alexandria sailing into Italy, put St. Paul and the other prisoners therein. And when they had sailed slowly for many days, the wind not suffering them to enter Cnidus—between Cos and Rhodes—running under the lee of Crete, they made, with difficulty, the port called "The Fair Havens," a few miles to the west of Lasea, a town the ruins of which were discovered in 1856. But, "because the haven was not commodious to winter in," they "loosed thence" and made for Phenice, still further westward on the south coast of Crete; and, while running past the little island of Clauda, were caught by the tempestuous north-east wind, Euroclydon, and after being tossed about "in Adria" for a fortnight were driven on the island of Melita, now Malta. Here St. Paul and his companions were transferred to a ship of Alexandria, "which had wintered in the isle, whose sign "was Castor and Pollux," bound for Italy. After three months they sailed from Melita, and, landing at Syracuse, stayed there three days, and thence sailed to Rhegium, and the next day to Puteoli, in the Bay of Naples, the great landing-place for passengers from Africa and the East, whence they went on by Appii Forum, and the Tres Tabernæ, where their friends came out to meet them, to Rome. The Castor and Pollux, after landing also all its costlier merchandise at Puteoli, probably continued its voyage to Rome, calling, with its cargo of Egyptian corn and piece goods, at all the intermediate ports between the Bay of Naples and the Tiber.

That the trade of Egypt with India was still carried on between port and port round the coasts of Arabia, and thence along the coast

of Persia to Barbarike, Barygaza and Musiris, is proved also by the astonishment created at Alexandria when, during the reign of Ptolemy Euergetes [B.C. 145–116], a man was found on the Egyptian coast of the Red Sea in a boat by himself, speaking in an unknown language, who was afterwards discovered to be an Indian, whose ship had been wrecked. The dangers of this primitive navigation are attested by the name given to a prominent headland on the south-east coast of Arabia of *ras-el-Kabir-Hindi* —"The Cape of the Indians' Grave;" and to the Strait of *Bab-el-mandeb*, "The Gate of Tears." This castaway, on being taken to Alexandria, offered to pilot an Egyptian ship back to India by the voyage he had himself made, and Eudoxus was sent on this voyage of discovery, and reached India and returned safely to Egypt with a cargo of spices and precious stones. But it was only in the reign of Claudius Cæsar, A.D. 41–55, when Egypt was completely under Roman rule, that the Red Sea route to India became really known, through the discovery of the Monsoons, by Hippalus, about A.D. 47. After this discovery the Egyptian merchants fixed the departure of their Indian ships from Arsinoe, Myos Hormos and Berenice, at the time of the heliacal rising of the Dog Star, about the middle of July, and, in about 30 days, reached Ocelis, near Aden, or Kane, the modern Maculla, whence, trusting to the south-west monsoon, they sailed confidently across the "black waters" of the Arabian Sea [the "Erythrean Sea"], and reached the Malabar coast in 30 or 40 days more, or about the middle of September, when the rejoicings of "Cocoa-nut Day" still proclaim that, with the close of the south-west monsoon, the navigation of the Arabian Sea is again open to the outward-bound native craft of Western India.

The Egyptian ships left India on the return voyage at the end of December, and were back at Berenice by the north-east monsoon in about 70 days; and from Alexandria to the Malabar coast and back the exchange between the productions of Europe and Asia was effected in less than a year. It was by this course that the trade by the Red Sea was now conducted for nearly 1,500 years, until the establishment of the Portuguese, Dutch and English trade with India, and so great was it that Pliny calculates the value of the gold and silver sent every year from Egypt to India, in exchange for Chinese and Indian goods, which were sold among the nations of the Mediterranean at over 4,000,000*l.*; "in no year does India drain our empire of less than five hundred "and fifty millions of sesterces, giving back her own wares in "exchange, which are sold among us at fully one hundred times "their prime cost." [Pliny, vi. 26.]

Arrian, in the Periplus of the Erythrean Sea, has described this trade in detail. I shall give only the exports and imports of the principal ports, following generally Vincent's translation.

African Ports.

At Adooli—Massouah Bay.

Exports.

Ivory, and Rhinoceros Horns.

Imports.

"Cloth with the nap on, of Egyptian manufacture, for the Barbarian" (a word derived originally from Berbera on the Somauli coast) "market."

Made-up Apparel, the manufacture of Arsinoe, or Suez.

Piece Goods, dyed, in imitation of stuffs of a superior quality.

Linen.

Striped Cloths and fringed, [δικρόσσια].

"Glass, and Glass Vases, in imitation of Murrhine Vases," that is the Agate Cups of Cambay and Broach.

Some Alloy of Gold, cut into pieces so as to pass for money.

Brass, Iron, Hatchets, Adzes, Knives, Daggers, Brass Bowls, Roman Denarii.

Wine of Laodicea (not the great Laodicea [Revelation iii. 17] near Colossæ in Phrygia, but the Syrian port the present Latakia south of Antioch) and Italy.

Oil in great quantity.

Gold and Silver Plate, made up in the fashion of the country.

Coats, and Cloaks, and Coverlids.

"Indian Steel [σιδηρος 'Ινδικός]; Indian Cottons [ὀθόνιον 'Ινδικόν], wide and plain," of the sort (Bruce, iii. 62) still imported into Abyssinia from Surat.

Cotton for stuffing couches and mattresses.

"Sashes [περιζώματα] in great request," as they still are.

"Cotton Cloths of the colour of the Mallow flower," made nowhere but in India.

Fine Muslins [σινδόνες] and Gum Lac, yielding Lake.

The Muslin and Mallow-colored Cottons, and the Gum Lac, here are Indian, as well as the goods specified as such by Arrian; while it is interesting to observe that Egypt competed by its imitations of glass, and made-up apparel, with the genuine Indian manufactures, just as Manchester and Birmingham do now; and the Egyptians were cunning in all the tricks, such as "sizing" of these imitation manufactures, for, among the piece goods imported at Barbarike, Arrian notices "a large assortment of plain cloth, "and some of fraudulent (bastard, base) manufacture": ἱματισμὸς ἁπλοῦς ἱκανὸς, καὶ νόθος, οὐ πολύς.

At **Abalites** and **Malao, Bay of Zeyla.**

Exports.

Aromata, Ivory, Tortoise Shell, Myrrh, Frankincense, Cinnamon, and Cassia, Κάγκαμον ["*Decamalli* Gum" of Bombay Bazaar ?], Μάκερ [not Mace], and Slaves.

Imports.

Flint Glass, Διοσπολιτικὴ ὄμφαξ, (some sort of Sauce, apparently rob of grapes,) "Barbarine Cloths," Corn, Wine, Tin (κασσίτερος).

"Brass and Copper prepared to imitate Gold."

Iron, and Specie, but not much.

It was in reliance on this list of exports that I sought the botanical sources of the Frankincense of commerce in the Somali country, and through Colonel Playfair's zealous and disinterested cooperation, they were found there. See my paper "On the Genus Boswellia," Lin. Soc. Trans. Vol. xxvii. (1871).

At **Mosullon, Berbera.**

Exports.

Inferior Cinnamon, Aromata and fragrant gums [εὐώδεα], Tortoise-shell, Incense [μοκρότον], Frankincense, Myrrh, Ivory.

Imports.

Glass, Iron, Silver plate, &c., as at the previous ports.

At **Tabai,** south of "Aromata Promontorium," Cape Guardafui.

Imports.

As at the previous ports.

Exports.

Cassia, Cinnamon, Aromata, Frankincense.

At **Opone,** south of Tabai.

Imports.

Corn, Rice Ghee [βούτυρον], Sesamum Oil [ἔλαιον Σησάμινον], Cotton woven and for stuffing, Sashes, Sugar [μέλι τὸ καλάμων, τὸ λεγόμενον Σάκχαρι].

Exports.

Cinnamon, Aromata, Tortoise-shell, and Slaves of a superior sort, and chiefly for the Egyptian market.

All these imports are from India, and exactly such as are exported in native boats from Bombay and Surat to the East Coast of Africa at the present day.

At **Rhapta,** north of Zanzibar.

Imports.

Javelins of Moosa in Arabia, Hatchets, Bills, Knives, Awls, Glass.

Exports.

Ivory, Rhinoceros Horn, Tortoise-shell, and Cowries? [ναύκλιος ὀλίγος].

Arabian Ports.

At **Moosa** near **Mocha.**

Imports.

Purple Cloth [πορφύρα], "Made-up apparel in the Arabian fashion," Saffron, Turmeric, Muslins. Quilts, Sashes, Specie, Wine, and Corn.

Exports.

Myrrh of the choicest quality [σμύρνα ἐκλεκτική], Στακτὴ ἀβειρμιναΐα [some sort of perfume of Minæa], Λύγδος [Loadstone, *i.e.*, Lydian stone], "with all the articles that are imported from "Adooli, on the opposite coast." Arrian also mentions Dragons' Blood, κιννάβαρι, as a product of Dioscorida, Socotra. Nothing is said of Coffee. The word *abir* in India is used like the word *atar* for any mixed perfume; and the *obir* of Bombay is compounded of sandalwood, violets, orange flowers, rosewater, musk, and spikenard.

At **Kane, Moculla.**

Imports from Egypt.

Wheat, Wine, Cloths for the Arabian market, Adulterated Cloths (already noted under Adooli) in great quantity, Brass, Tin, Coral, Storax. Also "Wrought Plate," "Specie for the King," Horses, Carved Images, Cloth of a superior quality.

Exports.

Frankincense, Aloes (from Socotra). It was here that Carter found the Arabian Frankincense plant named after him, *Boswellia Carterii.*

INDIA.

At **Omana,** in Gedrosia, Beluchistan.

Imports.

Brass, Sandalwood, or perhaps Teak, *sag* [ξύλων Σαγαλίνων], Horn, Ebony in round pieces [φαλάγγων Ἐβενίνων], Φαλάγγων Σησαμίνων (Bombay Blackwood ? in planks).

Exports.

Pearls, to Arabia, and Barugaza, Purple, Cloth, Wine, Dates in large quantity, Gold, Slaves.

At **Barbarike,** at the Mouth of the Indus, corresponding with the modern Karachi.

Imports.

Apparel, very fine Cottons, Topazes, Coral, Storax, Frankincense, Glass Vessels, Plate, Specie, Wine.

Exports.

Costus, Bedellium, *Rusot* (λύκιον), Spikenard, Emeralds, Sapphires, Furs and Silks from China, Indigo (Ἰνδικὸν μέλαν).

At **Barugaza, Baroach.**

Imports.

Italian, Laodicean, and Arabian Wine, Brass, Tin, Lead, Coral, Topazes, Storax, Sweet Lotus, White Glass, Perfumes, Stibium for tinging the eyes, Cloths, and Sashes.

Exports.

From up country, Saffron, Spikenard, Costus, Bdellium Myrrh, *Rusot*, Ivory, Onyx, Cottons of all sorts, mallow-coloured Cotton, Silk Thread, and Long Pepper (from down the coast; also Murrhine, *i.e.*, Cambay Stones, and Baroach Agate Vases).

At **Nelkunda,** near **Musirs** (Mangalore).

Imports.

Specie in large quantity, Topazes, Fine Cloths and Plain Cloths, Stibium, Coral, Glass, Brass, Tin, Lead, Wine, "as profitable here as at Barugaza," Cinnabar, Arsenic, and Wheat, "not for sale, but for the use of the crew."

Exports.

Pepper, "which is the staple of the country," "the best Pearl" (brought from Ceylon), Ivory, Silk (from China), Spikenard from the Ganges, Betel, Diamonds, Rubies, Tortoiseshell "from the Golden Chersonese and the islands (Laccadive and Maldive) off Limurike (Malabar)."

Arrian observes, "There is a great resort of shipping to this port for Pepper and Betel."

At **Masalia, Masulipatam.**

Here he simply mentions that "a great quantity of the finest Muslins are made."

More than three centuries had passed away, and while the masses of barbarians were crushing into the Western Empire, and later, while the Saracens were establishing themselves in Damascus, Cairo, Baghdad, and Cordova, Constantinople became the *entrepôt* of the trade of the East, which came to it not only through Egypt and Mesopotamia, but from Central Asia and India through Persia by Bayazid and Trebizond, and through Russia by Olbia and Cherson. Lying between two great continents and two inland seas, and the Danube, and the Nile, and Euphrates, Constantinople is the natural emporium of the trade of Europe and Asia, and commands absolutely, in the hands of a powerful government, which its position alone should ensure it, all the overland communications between the East and the West by Egypt, by Mesopotamia, and by the Danube and Persia. Had the barbarians come into Europe in a peaceful immigration, and gradually renewed the vigour of the colossal Roman Empire, that empire might have continued to the present day, with all the Indo-Germanic nations of Europe and Asia included within its limits, in one undivided Aryan family, ruling from Constantinople, as the crowning city of the Old World. For a time it seemed as if the fortune of Constantinople would indeed prove equal to its unparalleled position. The introduction of the manufacture of silk into Europe, and the rapid development of Saracen civilisation, gave a

great stimulus to the commerce of the Mediterranean; but with the extension of the military dominion of the Ottoman Turks over the whole area of the Eastern Empire, the Indian trade was again thrown into a disorder which now proved incurable.

During the Crusades the splendours of the Indian trade had for a brief while been revived by Venice.

> "Once she did hold the gorgeous East in fee,
> And was the safeguard of the West; the worth
> Of Venice did not fall below her birth—
> Venice, the eldest child of Liberty."

But at last the systematic determination of Prince Henry the Navigator to discover a way to India round by Africa was crowned with success, and the trade of the East was permanently diverted from the Mediterranean nations to pour its wealth into the cities of Portugal, the Netherlands, Germany, and England. Vansleb has left us a record of the commerce of Alexandria in 1672–73, after the trade with India round the Cape had been thoroughly established, and that of the Mediterranean had already begun to decline. He says:—"The Trade of the *French* Mer-"chants with this City is the greatest that they have in all the "Eastern Parts, for there is no place in *Turkie* where so many "*French* ships come as into this *Haven*. From the beginning of "the Year 1672 to the month of *June* there was no less than "nineteen *French* ships that came hither, and in the month of "*June* I reckoned fourteen. This is a considerable number, but "not to be compared with the number of Vessels that visited this "Haven heretofore, for Monsieur *Lucasole*, that did the Office of "Chancellor of the *French* Nation, told me that he remembered "there have been at *Alexandria* in one Year ninety-four *French* "ships."

Then he gives a list of the imports and exports of Egypt.

Exports from Egypt.

Gums.—Benjoin, Bdellion, Arabic, Adragant [Tragacanth], Lack, Turick, Myrrh of Ethiopia, Frankincense in tears; Storax.

Juices.—Aloë Cicotrin, Aloë Epatick, Opium, Indigo named Serquis, Indigo of Bagdat, Indigo of Balluder, Cassanad, Sugars in great loaves, Sugars in little loaves, Sugar-Candy, Sugar-Soltani; Sorbet.

Wood.—Sandal-wood, Citron-wood, Turbit-wood, Ebene-wood; Brasil-wood.

Rinds.—Cinnamon of Conchi, Cinnamon of Malabari, Cinnamon of Zeilani.

Fruits and Seeds.—Cassia, Coco of Levant, Coriander, Coffee, Dates, Mirabolans Kebus, Mirabolans sirnamed Balludri, Mirabolans sirnamed Citrin, Nutmegs, Nuts to vomit [Nux-Vomica], Cardamom, Ben, a fruit of the Indies [*Moringa pterygosperma, Saigut* of Bombay], Tamarindis, Coloquinte, Pepper, Cloves.

Herbs.—Flax or Hemp of Menuf, Flax or Hemp of Squinanti, Black Flax, Flax or Hemp of Fium, Hemp of Forsett,

Hemp of Oleb of the Bezantins [Russian Hemp from Olbia?] Sené.

Flowers.—Spikenard; Saffron of Nambrosea; Saffron of Said; Cotton; Cotton in Thread; Cotton in Ramo or Branches.

Roots.—Hermodats; Roots of Sine [Sené or Senna?]; Ginger; Citronart; Rhubarb; Salsepareille.

Teeth.—Elephants' Teeth.

Wool.—Unwashed and Washed.

Feathers.—Austrich; Austrich of the Tails; Austrich of the Back, Sharp [?], Sharp of the Wings.

Fish and other Sea Commodities.—Lizard, green; Pearl shell; Salt Fish.

Mummies.

Salts.—Ammoniac [so called from Temple of Jupiter Ammon, *i.e.*, of Jupiter in the Sands]; Nitre [so called from Nitria]; Rock Alum.

Linen.—Blue Linen; Blue of Alexandria, of Menuf; Great Blue of Inbab; Little Blue of Cairo, of Alexandria, of Col; Painted Linen (Chintzes?); Battanones; Magrabenes; Messalines; Lizarde; Cambrasine.

Stuffs.—Wrought Stuffs of Cairo, of Damietta, of Alexandria; Girdles of Rosetta (Arrian's sashes?); ordinary Girdles; Fine Handkerchiefs; ordinary Handkerchiefs; other ordinary Handkerchiefs.

Bladders.—Musk.

Carpets.—Fine Carpets, 2 piasters or 1½ the ell; Coarse Carpets, ½ a piaster the ell.

Imports from Europe.

Minerals.—Agarick; White Arsenick; Yellow Arsenick; Archifù; Orpiment; Antimony; Sublimated; Quick-silver; Vitriol; Vermillion; Cinaber; Salsepareille; Fine Cine.

Flowers and Herbs.—Nardum Celticum; Spiknard.

Iron, Steel, Copper, Lead, and Pewter.—Copper Thread; Beaten Brass; White Iron or Tin; Steel of Venice; Lead; Pewter.

Seeds.—Cochenelle.

Paper.

Silk Stuffs.—Sattin of Florence.

Clothes.—Of London; of Bucioche; of the Holy Bridge of Rome; of Holland-fashion; Scarlet; Caps of Marseilles; other Caps; Caps of perfect make.

Corrals, &c. &c.—Of Messina; Taraille; Corrals wrought; White Tartre; Red Tartre; Brasil; Rock Alum.

This is almost the Indian trade of the present day, and exactly the trade which the Portuguese and Dutch and French found going on along the coasts of India; and so it remained until the extinction of the English East India Company's monopoly exposed the natives of India to the stark competition of Manchester and Birmingham.

The following list of eastern commodities in which the English Company traded, is taken from their sales and account books, and

other manuscript records preserved in the India Office, and well represents the commerce between Europe and the East round the Cape of Good Hope during the seventeenth and eighteenth centuries—A.D. 1671–1734. The spelling of the original documents is preserved :—

Accoris ; Acchar in jars ; Aggats ; Ambergreece.
Alloes Socotrina ; Alloes Epatica.
Ammoniacum ; Assafœtida.
Auri pigmentum.
Benjamin ; Bezoar Stones ; Borax or Tincal ; Buffaloe hydes ; Bulgar [*i.e.*, Russian] hydes.
Cabinets ; Camphire ; Canes and Rattans ; Carmania Shells [query, Shawls] ; Carmania wool ; Cambogium.
Cardamoms ; Cassia Fistula ; Cassia Lignum ; Catechu.
Charran oyl (?).
China Fans, Images, and Pictures.
China-root ; China Ware [in immense quantities] ; Cinnamon ; Cinnamon de Matte ; Cinnamon Tramboon.
Civet ; Cloves ; Clove Bark ; Cocculus Indicus ; Coffee.
Cordivants and all sorts of leather.
Cotton Yarns ; Cornelian Rings ; Corrall ; Couries.
Cubebs ; Cypris Longa [Cypris Roots] ; Cytern.
Dates ; Diamonds ; and all Precious Stones.
Draconis Sanguis.
Earth Red ; Ebony Wood ; Errendy Yarn [Wild Silk].
Estrich Feathers.
Floretta Yarn [Floss-silk ?]
Folio Indico [Malabathrum].
Galbanum ; Gallingall ; Goa Stones (?) ; Gold.
Gum Arabick ; Gum Sarcaball [Sarcocolla ?] ; Green-Ginger.
Hard Wax.
Indico ; Indico of Lahore, and flat ; Iron.
Jappan Copper ; Jappan Ware.
Kagnes Cambojium.
Lacks of all sorts ; Lacquered Ware ; Lapis Lazula ; Lapis Tutia ; Long Pepper.
Mace ; Mangoes ; "Match" (?) ; Merabolams ; [also spelled Mirabolans] ; Myrrhe [also Mirrh] ; Musk.
Nuts Conduca [Bonduc ?] ; Nutmegs ; Nux Vomica.
Olibanum ; Opium ; Opoponax ; Orpiment ; [Ostriches Feathers, *see* Estrich Feathers ; Oyl of Mace.
Pepper ; Pertian Yarne [Persian ?] ; Pound Cuttroon (?)
Quilts.
Red Saunders [also as Reed Wood].
Rice ; Roman Vitriol (?) ; Rubarb [and Rhubarb].
Sago ; St. Helena hides ; Salamoniack ; Safflower ; Salgem ; Saltpetre ; Sandalwood ; Sal Prunella ; Sappan ; Scamony ; Sealing-wax ; Sena.
Silk (Raw, Bengal, and China).
Skreens, Spices, and other oyles.
Spicknard (and Spikenard) ; Sugar and Sugar Candy ; Suttadas (?).

Tea [Thea in list of 1671]; Tamarine; Tincall, [*see* Borax]; Tortois Shells; Turbeth; Tumerick; Tutenague (?); [and Tutenage].
Vermillion.
Wax [*see* Hard Wax]; Wormseed;
and piece goods of upwards of 200 leading denominations. Atlases [Sattins], Baftas, Canvas, Chintzes, Diapers, Dimities, Ginghams, Gauzes, Longcloths, Mulmuls [Muslins], Quilts, Sailcloths, Taffaties, and Muckmuls [Velvets], all of which are given in detail under the section on Cotton Goods.

The devotion of Waghorn, and the genius and heroic enterprise of De Lesseps, are destined to restore to Egypt and Italy and Greece the greatness of their ancient trade with India; and, owing to the development of trade with the eastern coast of Africa, the Suez Canal will now always remain the great channel of commercial intercourse between the East and West. But, stimulated by the immense discoveries of gold and silver in the present generation, and the use of steam carriage and electricity, modern commerce is returning to all its overland routes between Europe and Asia. It is not deserting the more modern way by the Cape of Good Hope, but is simply flowing into every channel that is opened to it, and the next generation will probably see all the old cities of the Tigris and Euphrates valley again rising from the dust and oblivion of ages; and Petra, Jerusalem, Palmyra, Tyre, and Sidon, Aleppo, Antioch, and Tarsus, once more participating in the returning prosperity of Egypt and Mesopotamia. Not in all cases the same cities, but new ones corresponding with them in situation and greatness. Owing moreover to the intrusion of Europe into Asia, through the conquests of Russia, the area of the transit lands between these continents is being extended further eastward; and, as commerce seeks the shortest routes, and always finds them at last in spite of every obstacle, a new line of communication is sure to be formed between Southern Asia and Europe nearer to India than either the Suez Canal or the Tigris and Euphrates valley. A great overland trade must again spring up in the tracks of the old caravan route between India and Russia, having its emporium possibly at Merv; again must commerce flow between India and the Black Sea, by Bayazid, Erzerum, and Trebizond; and when the use of the Persian Gulf route is revived Mahammerah will probably eclipse the fame of Baghdad and ancient Babylon. The shortest line, however, between almost any part of Europe and India leads through Russia, the Caspian Sea, and Persia. From Astrakhan to Bandar Abbas is a perpendicular line of some 1,400 miles, of which one half lies through the Caspian Sea: it is barely 200 longer to Karachi. As sure as the fall of a plummet will the commerce of the future between India and Europe gravitate to this new line. From Bandar Abbas it will run through Kirman, by Yezd, Julfa, Ispahan, Kashan, Kum, Teheran, Kazviu, and Resht, and along the western shore of the Caspian, to Baku and Astrakhan, whence it will branch off to every part of Europe.

THE MASTER HAND CRAFTS OF INDIA.

The present collection of Indian handicraft consists principally of the presents made to the Prince of Wales during his recent visit to India. It is therefore primarily not a systematic collection of Indian handicraft, but of objects of Indian art suitable for presents. Many things, therefore, indeed whole classes of some of the most interesting and instructive of the traditional industries of India, which we have been accustomed to see at previous Exhibitions, are absent from the present Exhibition. But, on the other hand, many objects are now shewn of the highest artistic value, but which are so costly, and have required so long a time for their production, that there would never have been an opportunity of seeing them out of India, except among the rich and rare offerings of its greatest Chiefs and Princes to the heir to the British Throne and Empire. Her Majesty's Commissioners for the Paris Exhibition have, however, been enabled to exhibit some of the classes of Indian handicrafts not represented in the collection of the Prince's presents, partly by purchases made under their own orders in India, particularly of pottery, one of the purest traditional arts practised in that country, and still more largely through the cooperation of the leading London importers of Indian hand-wrought goods,—the house of Vincent Robinson & Co., Messrs. Farmer & Rogers, and Messrs. Watson & Bontor, who, with the Maharajah of Cashmere, together contribute the most extensive and most instructive series of Indian tissues, stuffs, broidered work, and carpets ever displayed in Europe.

The Government of India has also sent a complete collection of the natural productions of India, which have been so admirably arranged by Mr. Simmonds that it is not necessary to say anything more about it than I have already done in drawing attention to the light it throws on the antiquity and historical development of Indian commerce. The collection of woods, and other forest productions made under the direction of Dr. Brandis, the Director-General of Forests, is of the highest scientific, as well as commercial, interest. I have added, as Appendix B, a special memorandum on Chinchona cultivation in India.

It is impossible in describing Indian handicrafts to follow the classification adopted at European Universal Exhibitions of Art and Industry, based as it is on the broad distinction that must be drawn between art and industry, when industrial productions are no longer hand-wrought, but "turned out," as it is aptly phrased, by machines. Thus, the very word manufacture has come at last in Europe to lose well nigh all trace of its true etymological meaning, and is now generally used for the process of the conversion of raw materials into articles suitable for the use of man by machinery. Even sewing—such sewing—has come to be done by machines. Work thus executed, in which the invention

and hand of a cunning workman have had no share, must be classified apart, and under the most intricate and elaborate divisions. Machinery and mechanical processes cannot be applied to any artistic work, except the frank and avowed imitation or copying of great art works, not for the æsthetic enjoyment of such copies, which is almost universally impossible, but simply for the purpose of art instruction, although it is possible that not even this advantage is gained.

In India everything, as yet at least, is hand wrought, and everything, down to the cheapest toys and earthen vessels, is therefore more or less a work of art. On the other hand, it is impossible to rank the decorative art of India, which is a crystallised tradition, although perfect in form, with the ever living, progressive arts of Europe, wherein the inventive and creative genius of the true poet, acting on his own spontaneous inspirations, asserts itself, and which constitute the Fine Arts, as they are called. The spirit of fine art is everywhere latent in India, but it has yet to be quickened into creative operation. It has slept ever since the Aryan genius of the people would seem to have exhausted itself in the production of the Ramayana and Mahabharata. But the Indian workman, from the humblest potter to the most cunning embroiderer in blue and purple, and scarlet [Ex. xxxviii. 23], is a true artist, although he seldom rises above the traditions of his art.

It is very necessary also to bear in mind that we have in India several distinct and indigenous varieties of decorative art; the savage arts of the original black and yellow Turanian tribes of the peninsula, now found only in the hills, or in the most inaccessible parts of the plains; and Hindu art, derived from the contact and subsequent mixture of the Aryan immigrants with the local Turanian races; and, lastly, the art which resulted from the influences of Arabian and Persian arts in India, which is peculiarly distinguished as Indian art. Indian collections are now also, unfortunately, becoming, at every succeeding exhibition, more and more overcrowded with mongrel articles, the result of the influences on Indian art of English society, missionary schools, schools of art, and international exhibitions, and, above all, of the irresistible energy of the mechanical productiveness of Manchester and Birmingham, and Paris and Vienna. No collection from India has ever shewn this great and growing evil so flagrantly as that of the Prince's presents. It was desired to do the Prince the utmost honour, and the native chiefs and princes, in many instances despising their own arts, had literal copies executed, in solid silver, of the latest Birmingham patterns in teapots (which came originally from India) and paper weights, and centre pieces, as the most acceptable gifts they could lay before the Prince. It was fortunate that they did so, for an evil which has been made so conspicuous will be checked. The natives have, indeed, a great genius for imitation. Thus Nearchus [Strabo, xv. 1, 67], producing proofs of their skill in works of art, says that, when they saw sponges in use among the Macedonians, they imitated them by sewing hairs,

thin threads, and strings inextricably through flocks of wool, and, after the wool was well felted together, drew out the hair and threads and strings, when a perfect sponge remained, which they dyed with bright colours. That is exactly what a native, under a happy inspiration, would do. There quickly also appeared among Alexander's Indian camp followers manufacturers of brushes for scrubbing the body, and of vessels for oil, which they saw the Greeks using.

Terry, in his "Voyage to the East Indies," 1655, in describing the people of India, writes:—"The natives there show very much "ingenuity in their curious manufactures, as in their silk stuffs, "which they most artificially weave, some of them very neatly "mingled either with silver or gold, or both; as also in making "excellent quilts of their stained cloth, or of fresh-coloured "taffata lined with their pintadoes [prints or chintz], or of their "satin lined with taffata, betwixt which they put cotton wool, "and work them together with silk. . . . They make likewise "excellent carpets of their cotton wool, in mingled colours, some "of them three yards broad and of a great length. Some other "richer carpets they make all of silk, so artificially mixed as "that they lively represent those flowers and figures made in "them. The ground of some others of their very rich carpets is "silver or gold, about which are such silken flowers and figures "most excellently and orderly disposed throughout the whole "work. Their skill is likewise exquisite in making of cabinets, "boxes, trunks, and standishes, curiously wrought within and "without; inlaid with elephants' teeth or mother-of-pearl, ebony, "tortoiseshell, or wire. They make excellent cups and other "things of agate or cornelian, and curious they are in cutting of "all manner of stones, diamonds as well as others. They paint "staves or beadsteads, chests or boxes, fruit dishes or large "chargers extremely neat, which, when they be not inlaid as "before, they cover the wood, first being handsomely turned, "with a thick gum, then put their paint on most artificially made "of liquid silver or gold or other lively colours which they use, "and after make it much more beautiful with a very clear varnish "put upon it. They are also excellent at limning, and will copy "out any picture they see to the life. . . . The truth is, that the "natives of that monarchy are the best apes for imitation in the "world, so full of ingenuity that they will make any new thing "by pattern, how hard soever it seem to be done, and therefore "it is no marvel if the natives there make boots, cloaths, linen, "bands, cuffs of our English fashion, which are all very much "different from their fashions and habits, and yet make them all "exceedingly neat."

We therefore incur a great responsibility when we deliberately undertake to improve such a people in the practice of their own arts, and hitherto the results of our attempts to do so have been anything but encouraging. The Cashmere trade in shawls has been ruined through the quickness with which the weavers have adopted the "improved shawl patterns" which the French agents of the Paris import houses have set before them, and presently we

shall see what the effect of the teaching of our Schools of Art has been on Indian pottery, the noblest pottery in the world until we began to meddle with it. The great dread of course is of the general introduction of machinery into India; that, just as we are beginning in Europe to understand what things may be done by machinery and what must be done by hand work, if art is of the slightest consideration in the matter, in India, owing to the operation of certain economic causes, machinery may be gradually introduced for the manufacture of its great traditional handicrafts, resulting in an industrial revolution which, if not directed by an intelligent and instructed public opinion, and the general prevalence of refined taste, will inevitably throw the decorative art of India into the same confusion of principles, and of their practical application to the objects of daily necessity, in the use of which we should have delight, which has for three generations been the destruction of decorative art and of middle-class taste, in England and North-western Europe, and the United States of America. We therefore incur a great responsibility in attempting to interfere in the direct art education of a people who already possess the tradition of a system of decoration founded on perfect principles, which they have learned through centuries of practice to apply with unerring truth.

The social and moral evils of the introduction of machinery into India are likely to be still greater. At present the industries of India are carried on all over the country, although weaving is everywhere languishing in its fast failing competition with Manchester, and the Presidency Mills. But in every Indian village all the traditional handicrafts are to be still found at work.

Outside the entrance, on an exposed rise of ground, the hereditary potter sits by his wheel moulding the swift revolving clay by the natural curves of his hands. At the back of the houses, which form the low irregular street, there are two or three looms at work, in blue, and scarlet and gold, the frames hung between the acacia trees, the yellow flowers of which drop fast on the webs as they are being woven. In the street the brass and copper smiths are hammering away at their pots and pans; and further down, in the verandah of the rich man's house, is the jeweller working rupees and gold mohrs into fair jewelry,—gold and silver earrings, and round tires like the moon, bracelets and tablets and nose rings, and tinkling ornaments for the feet, taking his designs from the fruits and flowers around him, or from the traditional forms represented in the paintings and carvings of the great temple, which rises over the grove of mangoes and palms at the end of the street above the lotus-covered village tank. At half-past three or four in the afternoon, the whole street is lighted up by the moving robes of the women going down to draw water from the tank, each with two or three water jars on her head: and so going and returning in single file, the scene glows like Titian's canvas, and moves like the stately procession of the Panathenaic frieze. Later the men drive in the mild grey kine from the moaning jungle, the looms are folded up, the coppersmiths are silent

the elders gather in the gate, the lights begin to glimmer in the fast-falling darkness, the feasting and the music begin, and the songs are sung late into the night from the Ramayana or Mahabharata. The next morning with sunrise, after their simple ablutions and adorations performed in the open air before their houses, the same day begins again. This is the daily life going on all over Western India in the village communities of the Deccan, among a people happy in their simple manners and frugal way of life, and in the culture derived from the grand epics of a religion in which they live and move and have their daily being, and in which the highest expression of their literature, art, and civilisation has been stereotyped for 2,000 years.

But of late these handicraftsmen, for the sake of whose works the whole world has been ceaselessly pouring its bullion for 3,000 years into India, and who, for all the marvellous tissues and embroidery they have wrought, have polluted no rivers, deformed no pleasing prospects, nor poisoned any air; whose skill and individuality the training of countless generations has developed to the highest perfection, these hereditary handicraftsmen are being everywhere gathered from their democratic village communities in hundreds and thousands to the colossal mills of Bombay, to drudge in gangs at manufacturing piece goods, in competition with Manchester, in the production of which they are no more intellectually and morally concerned than the grinder of a barrel organ in the tunes it turns out.

I do not mean to depreciate the proper functions of machines in modern civilisation, but machinery should be the servant and never the master of men. It cannot minister to the beauty and pleasure of life, and can only be the slave of its drudgery. It should be kept rigorously in its place, in India as well as England. When in England machinery is no longer allowed, by the force of cultivated taste and opinion, to intrude into the domain of art manufactures (as they are called by a *present* contradiction of terms), which belongs exclusively to the trained mind and cunning hand of individual workmen, wealth will become more equally diffused throughout society, and the working classes, through the elevating influence of their daily work, and the growing respect for their talent and skill and culture, will at once rise in social, civil, and political position, raising the whole country, to the highest classes, with them; and Europe will learn to taste of some of that measureless content and happiness in life which is found even to-day in the pagan East, and was once found in pagan Greece and Rome.

Gold and Silver Plate.

The first objects among the Prince's presents which strike the visitor on entering the Indian Court are the cases of gold and silver plate. A silver-gilt service for *pan* and *atar* (betel leaf and perfumes), from Mysore, is a good example of pure Hindu work, and the elaborately chased goblets (*sarai*) and rose-water sprinklers, some in ruddy gold, and others parcel-gilt, are almost

perfect examples of the exquisite goldsmith's work of Cashmere and Lucknow; the work of Cashmere being distinguished by the introduction of the shawl pattern cone in the chasing. This "ruddy gold" also is only seen in Cashmere and Burmese work. All over India, elsewhere, gold is stained deep yellow, except in Scinde, where the jewellers often give it a singular and very artistic tinge of olive-brown. By the side of these elegant and comely vessels of silver and gold are to be found some of the most glaring illustrations of the debasement of Hindu and Indian art under European influences in the whole collection. The obtrusive gold vase from Mysore was probably modelled after a spurious [George IV.] Adam's vase. There are two gold chargers and a tea service, which are mere copies of the worst Birmingham patterns, and a pair of mounted bison's horns, a monstrous product of the attempt to combine Indian with European designs in decorative art. In a tea service from Madras the Prince of Wales' Plumes and the Royal Arms of England are mixed up, not in their heraldic, but in their naturalistic forms, with the strictly conventionalised *swami* work of that Presidency, in which the ornamentation consists of figures of Hindu gods in high relief, either beaten out from the surface [*repoussé*], or fixed on to it, whether by soldering, or wedging, or screwing them in. The Greeks called the art of working metal in relief τορευτικὴ, and the artists in such work in Rome went by the name of *crustarii*, from the *crustæ*, or small ornaments in relief, with which they encrusted their wonderful productions; while the larger reliefs, which were fastened on to them in such a way that they could be removed at pleasure, as can be done with the larger of these Madras *swami* figures, were called *emblemata*. Nothing could be worse than the tea tray and tea pot, and sugar and milk bowls, in this Madras tea service. The cups and saucers are unobjectionable perhaps, while the spoons, which are Hindu in character, are decidedly pleasing. The silver desert service from the same Presidency is so elegant in design and so finished in workmanship, that no incongruity is seen in the application of native ornamentation to European forms. The hammered *repoussé* silver work of Cutch, Lucknow, and Dacca is all of foreign origin, the former Dutch, and the latter Saracenic and Italian; but it is nearly always good, as in almost all the examples in the Prince's collection. The centre-piece of Cutch (Dutch) work must, however, be excepted. It represents a conventionalised Pine-apple, the body of which conceals a liqueur bottle, the crown being shaped to hold flowers, and four griffins support the whole. It is a strange object, of German origin probably, though Dutch descent, but thoroughly naturalised in India, and the genuine design of an Hindu artist, although good neither in form nor decoration. The fine Cutch work exhibited by Lord Northbrook, is by Umersi Mauji, a silversmith of Buj. Lord Northbrook also exhibits a case of Burmese *repoussé* silver of the highest excellence in design and workmanship. From Hyderabad, in the Deccan, there is a parcel-gilt vase, an example of the pierced work (the *opus interrasile* of the Romans), of the Nizam's domi-

nions. The shape is Indian, but is not happy, being an imperfect combination of Hindu and Saracenic forms. A very noble example of this grand work was exhibited some years ago by Sir Seymour FitzGerald in the Indian Court at the Annual International Exhibition at South Kensington.

There are three cases entirely filled with the chased parcel-gilt work of Cashmere. Its airy shapes and exquisite tracery, graven through the gilding to the dead white silver below, softening the lustre of the gold to a pearly radiance, give a most charming effect to this refined and graceful work. It is an art imported by the Mogols, but influenced by the natural superiority of the people of the valley of Cashmere to all other Orientals in the elaboration of decorative details of good design, whether in metal work, hammered and cut, enamelling, or weaving. The candelabrum from Srinagar, both in form and decoration, is evidently derived through Persia from a Turkish original. The arts of Cashmere have also been largely influenced by the characteristic architecture of the valley, as the local arts of Madras have been developed from its architecture.

The Indian goldsmith has sometimes to execute his work on the grandest scale, reminding one of the gold work done for Solomon's Temple and household. If a Hindu has to undergo purification, one of the rites is to step through the *yoni*, the mystic symbol of female power. This is often done by sitting for an instant in the scar of any tree bearing a similitude to the sacred *yoni*. Sometimes the scar forms a true matrix, and may even penetrate the trunk of the tree, when the Hindu will step into and out of it again, or, which is holiest, pass right through it, in sign of his regeneration. I once saw an unending succession of Hindu pilgrims being "born again" in this way, hopping through the trunk of a great tree faster than they could be counted, rather as if they were "May-gaming" than going through the performance of a purificatory rite. But when the two Brahmins, whom Ragunatha Rao [Ragoba], the Mahratta Peishwa, sent to England in 1780, returned to India they were compelled to pass through a *yoni* made of the finest gold before they could be readmitted into caste. Ragoba himself, on his defeat and expulsion from his capital, had a cow of gold made, and was passed through it, in the hope of bettering his fortune. The king of Travancore about the same time, wishing to atone for all the blood he had spilt in his wars, was persuaded by the Brahmins that it was necessary for him to be born again, when a cow of gold was made of immense value, through which the king, after lying in it for a certain time, was passed, regenerated, and freed from all the crimes of his former life.

Metal Work, in Brass, and Copper, and Tin.

Vessels of brass and copper, dishes and bowls, *lotas*, candlesticks, images of the gods, and other mythological *emblemata*, sacrificial spoons, censers, and temple bells, and other sacred and domestic utensils are made all over India; and of the same

patterns as we find in representations of them on the oldest sculptures and cave paintings. The *lota* is the globular bowl, sometimes melon-shaped, with a low narrow neck, universally used in ceremonial and other ablutions, and its name is the same word as *lotus*, the water lily, and the Latin *lotus*—washed, and English lotion—a wash. It is found plain, and chased or graven, and encrusted. Very good brass work is made at Ahmednagger and Ahmedabad in Western India, and at Benares in Northern India; but that of Madura and Tanjore in the Madras Presidency is superior to all, and in its bold forms and elaborately inwrought ornamentation recalls the description Homer gives of the work of Sidon in bowls of antique frame. Some are simply etched, and others deeply cut in mythological designs, and others are diapered all over with *crustæ* of the leaf pattern, seen in Assyrian sculptures, copper on brass, or silver on copper, producing an effect often of quite regal grandeur. Castellani possesses the finest specimen known of silver encrusted on brown waxy copper. In the Prince's collection are several small Tanjore and Madura *lotas*, but none of superior excellence. The most interesting of all Indian *lotas* is one in the India Museum, of about A.D. 200–300, discovered by Major Hay in 1857 at Gundlah in Kulu, where a landslip exposed an ancient Buddhist cell, in which this *lota* with others had been lying buried for 1,500 years. It is exactly of the shape now made, and is enchased all round with a representation of Buddha, as Prince Siddhartha, before his conversion, going on some high procession. An officer of state, on an elephant, goes before; the minstrels, two damsels, one playing on a flute and the other on a *vina*, follow after; in the midst is the Prince Siddhartha, in his chariot drawn by four prancing horses, and guarded by two horsemen behind it; all rendered with that gala air of dainty pride and enjoyment in the fleeting pleasures of the hour which is characteristic of the Hindus to the present day, as if life were indeed—

> "musical as is Apollo's lute,
> And a perpetual feast of nectared sweets,
> Where no crude surfeit reigns."

Benares is the first city in India for the multitude and excellence of its cast and sculptured mythological images and "*emblemata*," not only in brass and copper, but in gold and silver, ivory and wood, which it will be more convenient to consider as sculptures, under the head of Ivory and Wood Carving; but in the Prince's collection are eight little brass figures from Vizagapatam, which for skilful modelling and perfection of finish, and a certain irresistible grotesqueness of expression, are the finest I have ever seen. They look as if the artist had been inspired by a study of Gustave Doré's illustrations of Don Quixote. The temple bells of India are well known for the depth and purity of their note. Besides the ordinary brass, a variety is used in India like that called by the ancients *æs candidum*, which is mixed with silver, and a still rarer, like the ancient *æs Corinthium*, which is mixed with gold. The dark "bronzes" in India are not of true bronze, a mixture of copper and tin, but of copper without alloy.

At Moradabad, in the North-West Provinces, tin is soldered on brass, and incised through to the brass in floriated patterns, which sometimes are simply marked by the yellow outline of the brass, and at others by filling in the ground with some black composition of *lac*, something after the manner of Niello work. Similar work, in the shawl pattern style, is sometimes seen from Cashmere, and the Earl of Northbrook exhibits a variety of it in two or three dishes, which is very rare in England. They are studded all over with little flowers, which shine like frosted silver out of a groundwork of blackened foliated scrolls, delicate as the finest Chantilly lace. It is very pretty and attractive.

Damascened Work.

Damascening is the art of encrusting one metal in another, not in *crustæ*, which are soldered on or wedged into the metal surface to which they are applied, but in the form of wire, which by undercutting and hammering is thoroughly incorporated with the metal which it is intended to ornament. Practically, damascening is limited to encrusting gold wire, and sometimes silver, on the surface of iron, or steel, or bronze. This system of ornamentation is peculiarly Oriental, and takes its name from Damascus, where it was carried to the highest perfection by the early goldsmiths. It is now practised with the greatest success in Persia and in Spain. In India damascening in gold is carried on in Cashmere, and at Gujerat and Sealkote in the Punjab, and in the Nizam's dominions, and is called *kuft* work; and damascening in silver is called *bidri*, from Bider, in the Nizam's Dominion, where it is principally produced. There is a cheap *kuft* work done by simply laying gold leaf on the steel plate, on which the ornamentation has been previously etched; the gold is easily made to adhere to the etching, and is then wiped off the rest of the surface. Except among the arms, to be presently noticed, there is very little *kuft* work in the Prince's collection. In the solitary separate example of it, the fern-like ornament, characteristic of the work of Sealkote and Gujerat, is applied to a sort of masonic emblem, a column with a ball on the top, labelled up and down its length with such words as "Fidelity," "Loyalty," &c., in modern English letters. Surely the force of British Philistinism in art could not possibly go further than this. Yet the articles in *bidri*, the highest art in India after enamelling, are even in worse taste, being copies in bronze of the lowest florid style of Italian alabaster vases, covered with Italian flower scroll patterns in beaten silver. The worst example of all is a washing basin and jug copied from a Staffordshire ware pattern. In *bidri* the metal ground is an amalgam of copper, lead, and tin, made black by dipping in a solution of sal ammoniac, saltpetre, salt, and blue vitriol. An inferior kind of *bidri* is made at Purneah in Bengal and other places. The art was originally imported from Persia by the Mahommedans.

Enamels.

Enamelling is the master art craft of the world, and the enamels of Jeypore rank before all others, and are of matchless perfection. There are three forms of enamelling followed.

In the first the enamel is simply applied to the metal as paint is applied to canvas; and in the second, translucent enamels are laid over a design which has been etched on, or hammered (*repoussé*) out of the metal. Both these are comparatively modern methods. The third form of enamelling by encrustation is very ancient, and is known under two varieties, namely, the *cloisonné*, in which the pattern is raised on the surface of the metal by means of strips of metal or wire welded on to it; and the *champ-levé*, in which the pattern is cut out of the metal itself. In both varieties the pattern is filled in with the enamel. In all forms of true enamelling the colouring glaze has to be fused on to the metal, There is indeed a fourth form of enamelling, practised by the Japanese. They paint in the pattern coarsely, as in the first form, and then outline it with strips of copper or gold, to imitate true *cloisonné* enamels. The Jeypore enamelling is *champlevé*. A large plate in the centre of the case is the largest specimen of it ever made. It took four years in the making, and is in itself a monument of the Indian enameller's art. Near it is a beautiful covered cup and saucer, similar to one belonging to Lady Mayo. The bowl of the spoon belonging to Lady Mayo's cup is cut out of a solid emerald, and as in all Hindu sacrificial spoons, from which it was designed, is in the same plane with the handle. It is perfect in design and finish, and is surely the choicest jewelled spoon in existence.

Another exquisite example of Jeypore enamelling is the little perfume box, or *atardan*, something like a patch box, with a cone-shaped cover, belonging to Mr. W. Anderson, in the South Kensington Museum, having a representation of Krishna, surrounded by cows and calves, and shepherdesses in a grove, with birds singing among the branches, all round the box; and of Krishna dancing with the fair shepherdesses, on a green ground of hills and valleys, dales and fields, all round the cover. It was surmounted with a yellow diamond, in perfect harmony with the colours of the green and white, blue, orange, and scarlet enamels, but the owner has replaced it by a perfectly inharmonious stone of the purest and most brilliant water. Of all the Prince's enamels the daintiest device is a native writing case, or *kulumdan*, shaped like an Indian gondola. The stern is figured like a peacock, the tail of which sweeps under half the length of the boat, irradiating it with blue and green enamels, brighter even than the natural iridescence of a peacock's tail. The canopy which covers the ink bottle is colored with green and blue, and ruby and coral red enamels. It is the mingled brilliances of its greens, and blues, and reds which, laid on pure gold, make the superlative excellence and beauty of Jeypore enamelling. Even Paris cannot paint gold with the ruby red and coral red, the emerald green, and turquoise and sapphire blues of the enamels of Jeypore, Lahore,

Benares, and Lucknow. In Lady Mayo's spoon the deep green enamel is as lustrous and transparent as the emerald which forms the bowl. Close to the gondola are some fine examples of old Jeypore enamelling. The handles of the yak's tails, and of the sandalwood and ivory horse wisps, and of the peacock's tails, which, like the yak's tails, are symbols of royalty throughout the East, are magnificent examples of the grandest of the art crafts of India, and truly regal treasures. The art is practised everywhere in India, but nowhere in such perfection as at Jeypore. It is probably a Turanian art. It was introduced into China, according to the Chinese, by the Yeuèchi, and was carried as early, if not earlier, into India. From Assyria it probably passed into Egypt, and through the Phœnicians to Europe. Sidon was as famed for its glass, as was Tyre for its purple; and the Sidonians were not only acquainted with glass blowing, but also with the art of enamelling in glass in imitation of the precious stones. Among the Prince's presents are several specimens of the charming Cashmere enamels, in which the ground of the usual shawl pattern ornamentation, cut in gold, is filled in with turquoise blue. Sometimes a dark green is intermixed with the blue, perfectly harmonised by the gold, and producing a severely artistic effect. The late Sir Digby Wyatt possessed a remarkably fine goblet in this style of Cashmere enamel.

At Pertabghar extremely effective and brilliant trinkets are made by melting a thick layer of enamel on gold, and, while the enamel is still hot, covering it with a network of thin gold, minutely cut into the shapes of elephants, tigers, peacocks, doves, and parrots, trees, and floriated scrolls, which are afterwards etched over with the graver, so as to bring out the most characteristic details of flower, foliage, bird and beast. Beautiful glass bracelets, or *bangles*, are made at Rampur, [hence nicknamed *Rampur maniharan*], near Meerut, and at Bellary and Mysore, in Madras. The glass phials for Ganger water, seen all over India, are made at Sawansa, in the Pertabghar district.

Arms.

The interest of the Prince's presents culminates in the arms. For variety, extent and gorgeousness, and ethnological and artistic value, such a collection of Indian arms has never been brought together before, not even in India itself, and it fairly defies description. No man was so poor but that he could present the Prince with a bow and arrow, or spear, or sword, or battle-axe, and, in fact, everyone who was brought before the Prince gave him an arm of some sort. The collection thus represents the armourer's art in every province of India, from the rude spears of the Nicobar islanders, to the costly damascened, sculptured, and jewelled swords and shields, and daggers and matchlocks of Cashmere, Lahore, Sealkote, Gujerat, Cutch, Hyderabad, Singapore, and Ceylon. Good arms are also made at Monghyr in Bengal, and at Kuduru and Vizianagram in Madras. Indian steel was celebrated from the earliest antiquity, and the blades of

Damascus, which maintained their pre-eminence, even after the blades of Toledo became celebrated, were in fact of Indian iron. Ctesias mentions two wonderful Indian blades which were presented to him by the King of Persia and his mother. The Ondanique of Marco Polo's Travels refers originally, as Col. Yule has shewn, to Indian steel, the word being a corruption of the Persian *Hundwaniy, i.e.*, "Indian steel." The same word found its way into Spanish, in the shapes of *Alhinde* and *Alfinde* first with the meaning of steel, and then of a steel mirror, and finally of the metal foil of a glass mirror. The Ondanique of Kirman, which Marco Polo mentions, was so called from its comparative excellence, and the swords of Kirman were eagerly sought after in the 15th and 16th centuries A.D., by the Turks, who gave great prices for them. We have seen that Arrian mentions Indian steel, σίδηρος Ἰνδικός, as imported into the Abyssinian ports; and Salmasius mentions that among the surviving Greek treatises was one περὶ βαφῆς Ἰνδικοῦ σιδήρου, "on the tempering of Indian steel."

Twenty miles east of Nirmul, and a few miles south of the Shisha hills, occurs the hornblende slate or schist from which the magnetic iron, used for ages in the manufacture of Damascus steel, and by the Persians for their sword blades is still obtained, The Dimdurti mines on the Godavery were also another source of Damascus steel, the mines here being mere holes dug through the thin granitic soil, from which the ore is detached by means of small iron crowbars. The iron ore is still further separated from its granitic or quartzy matrix by washing; and the sand thus obtained is still manufactured into Damascus steel at Kona Sumundrum near Dimdurti. The sand is melted with charcoal, with no flux, and is obtained at once in a perfectly tough and malleable state, and superior to any English iron or even the best Swedish. The Persian [Armenian] merchants, who in Voysey's day still frequented the iron furnaces of Kona Sumundrum, informed him that they had in vain attempted to imitate, in Persia, the steel formed from it. In the manufacture of the best steel ¾ of Sumundrum ore is used, and ¼ of Indore, which is a peroxide of iron.

The most striking object among the Prince's arms is a suit of armour made entirely of the horny scales of the Indian Armadillo, or Pangolin (*Manis pentadactyla*) encrusted with gold, and turquoises, and garnets. There is another splendid suit of Cashmere chain armour, fine almost as lace work. The style is essentially Persian and Circassian, and is identical with that of the armour worn in Europe in the 13th century. The damascened casque is surmounted with a plume of pearls. There are many other suits of armour with damascened breast plates, gauntlets, and greaves, which carry one back to the Crusades, and legendary history of modern Persia. Some of the sword blades are marvellously watered, several are sculptured in half relief with hunting scenes, and others are strangely shaped, teethed like a saw, and flaming (*flamboyant*); although for mingled cruelty and grotesqueness of appearance none match the battle-axes of the Sowrahs and Khonds.

Here are the *kukri* of the Gorkhas, the *adyakathi* of the Moplas, the *tiga* of the wild tribes of Central India, and the knife used in the Meriah sacrifice. We have also the great sword of Mahmud Chand Sultan Shah of the date of 1707, and the sword (No. 1439) of the famous Polygar Katabomma Naik, who defeated the English early in the present century, and most interesting of all the sword (No. 74) of Sivaji, the founder of the Mahratta dominion in India.

The rise of the Mahratta power was almost contemporary with our own appearance in India. The Mogol Emperors of Delhi were in the habit of taking the Hindu Princes and Chiefs into high employ, and amongst the Mahratta families in their service were the Bhonslas, whose tutelary deity was the goddess Bhowani of Tuljapur. It was of their family that the renowned Sivaji was born, at Sewnere, near Junir, about twenty miles south-west of Poona, in the very heart of the *mawuls* or valleys, which lie on the landward side of the Western Ghâts between Poona and Sattara. The hilly land between the Western Ghâts and the sea is called the Concan. This is the cradle of the Mahratta race, and it was with the hardy *mawulis*, or people of these inland and seaward valleys of the Western Ghats, that Sivaji laid the foundation of the Mahratta Empire, which at one time extended its sway over the whole Deccan. The Mahratta country indeed in its widest sense almost corresponds with the area of the Chalukyan style of temple architecture in India, as defined by Mr. Fergusson in the recent edition of his great work on "Hindu Architecture." It is the whole country between the Malabar and Coromandel coasts watered by the Nerbudda, Tapti, Godavery, Bhima, and Kistna. North of the Nerbudda lies Mr. Fergusson's area of Indo-Aryan architecture, and south of the Kistna the Dravidian. There is really no authentic history of Southern India, but to the Hindus Sivaji was not so much the destroyer of the hated Mohammedan supremacy in the Deccan as the restorer of the half mythical Hindu state of Salivahana, and hence the great power of his name all over India, which can be understood only by those who have some knowledge of the notions universally received by Hindus of their traditional history. As the British power grew in India, it was at last brought face to face with the Mahratta Confederacy, and between 1774 and 1818, we had to wage four harassing wars against them, signalised by the great battles of Assaye and Kirki, in which last their power was finally overthrown, although it was not until 1819 that their last fortress was taken. Their fortresses among the spurs of the Western Ghâts were their strength, and everyone of them has its legend keeping alive the spirit of nationality and patriotism among the hardy and romantic *mawulis*. Sivaji (nicknamed by Aurungzebe, "a mountain rat"), seized Tornea at the age of 19, and with the spoils built Raighur, where he was subsequently enthroned, and where he died. After building Raighur, he took Singhur and Purandhur, and it was from the Concan hill fort of Pertabghur, opposite Mahabaleshwur, that he issued, after receiving his mother's blessing and offering his vows to Bhowani, to perpetrate, by an act of the most detestable treachery, the assassination

of the generous and too confiding Bijapur General, Afzul Khan. He enticed him into a secret turning in the road leading down the hill side, and there, in pretending to embrace him, ripped his bowels open with the *wagnak* ("tiger-claw") concealed in his right hand, and then stabbed him to the heart with the *bichwa* ("scorpion" dagger) held in his left. He is the great national hero of the Mahratta Hindus, and his descendants are held in the highest reverence throughout the Deccan. Every relic of his, his sword, his daggers, and seal, all have been religiously preserved at Sattara and Kolhapur. Mr. Grant Duff in his "Notes of an Indian Journey" has described the worship of his famous sword, Bhowani, at Sattara. The sword in the Prince's collection is not this deified weapon, but the one that has always been kept, since Sivaji's death in 1680, at Kolhapur. The political value of the gift is simply incalculable. It was a family and national heirloom, which nothing but a sentiment of the profoundest loyalty could have moved the descendants of Sivaji to give up, and which has been sacredly guarded for the last 200 years at Kolhapur, as the palladium of their house and race, by the junior branch of the Bhonsla family.

All these historical weapons, the symbols of the latent hopes and aspirations of nations and once sovereign families, were literally forced on the Prince's acceptance in a spontaneous transport of loyalty, and their surrender may be fairly interpreted to mean that the people and princes of India are beginning to give up their vain regrets for the past, and, sensible of the present blessings of a civilised rule, desire to centre their hopes of the future in the good faith, and wisdom, and power of the British Government.

The barrel of a conspicuous matchlock in one of the centre cases is superbly damascened in gold, with a sort of poppy flower pattern, one flower nodding above another along the whole length of the barrel. It is the noblest example of damascening in the Prince's collection. Close to it is a Persian matchlock, the stock of which is carved in ivory, against a chocolate-stained background, with scenes of wild animal life, in which every group is a perfect cameo. The richer arms are resplendent with gold and enamelling, and gems, and are generally of uncontaminated Indian design. There is indeed but little room for the obtrusion of European design in Oriental arms.

There are, however, several swords and daggers which have been mounted in native design by English workmen, and the result is not less mischievous than when European designs are literally imitated by unsophisticated native handicraftsmen. The mechanical character of European manufactures requires a consistent general finish which is quite out of place in the bold and freehand compositions of the best native art work, in which finish is strictly subordinated to practical use and artistic effect; and, if a taste for mechanical perfection becomes prevalent with the spread of middle class English ideas among the princes and chiefs of India, Indian wrought arms and jewelry will soon become lost arts. The splendour of Indian arms and jewelry is

due to the lavish use of diamonds, rubies, emeralds, and other bright and colored stones. But, as their work is really manual, and grows up spontaneously, like a growing flower, under their hands, the native jewellers are able to use the most worthless gems on it, mere chips and scales of diamonds, often so thin that they will float on water, and flawed rubies and emeralds, which have no value as precious stones, but only as barbaric blobs of colour. The European jeweller can use with his machine-made work only the most costly gems, polished to the highest lustre, far too costly to be used except for their own effect and intrinsic value only, and it would be impossible to employ them merely to enhance the general decorative effect, as in India. There are examples in the Prince's collection of exquisite gold work in purely native design, but by English workmen; and the mechanical perfection of their work has forced them to use rose diamonds and brilliants, but necessarily so scantily that all effect of splendour is lost. Where in other examples worthless Indian stones have been set in machine-made English gold work, the effect is flat and mean beyond belief. If, therefore, Indian jewelry should become mechanical hard and glittery in character, it will at once cease to be artistic, and sink to the level of the vulgar and extravagant trinketry of Birmingham, Paris, and Vienna.

It will be seen that the battle-axes used by the wild tribes are identical in form with those found among the pre-historic remains of man in Europe, perhaps because they have all been instinctively modelled from the teeth of carnivorous animals. It is impossible also to overlook the strong resemblance of the forms of Persian and Arabian arms, and of Indian arms shewing Persian and Arabian influence, to those represented on the sculptures of Assyria and Babylonia, and in the hieroglyphic paintings of Egypt, as figured in Rawlinson's "Ancient Monarchies" and Wilkinson's "Ancient Egyptians." This is especially marked in the typical fiddle-shaped handles of the daggers. The Arabian arms, it will be noticed also, are distinguished by their fine filigrain work and the absence of gems, the Persian by their superb damascening, enamelling, and carving, and the rarity also of gems, only turquoises and pearls being generally used, except in the decoration of jade mountings; while the Indian are characterised by the high relief of the elaborately hammered and cut gold work, and the unsparing use of the precious gems adorning them. It is the special defect of Indian, particularly of Hindu art, to run into this excess and satiety of decorative details. It is the exclusive prerogative of Greek art to produce beauty without the use of ornament.

Jewelry.

Even a greater variety of style is seen in Indian jewelry than in arms. Mr. FitzGerald sent to the Annual International Exhibition of 1872 a collection of the grass ornaments worn by the wild *Thakurs* and *Katharis* of Matheran and the western Ghâts of Bombay, which had been made by Dr. J. Y. Smith, the accomplished Superintendent of this Hill Station; and by the

side of these grass collars, necklaces, bracelets, anklets, and girdles were exhibited also gold jewelry made of thick gold wire, twisted into the girdles, bracelets, anklets, necklaces, and collars, which are worn all over India, fashioned in gold exactly as the Matheran ornaments are fashioned in grass; the gold collars being identical with the "*torques*" (from *torqueo*, I twist), worn by the Gauls, which gave its name to the patrician Roman family of Torquatus, from Manlius having, about B.C. 361, earned immortal glory by slaying a gigantic Gaul, whose dead body he stripped of his torque, and placed it round his own neck. The Gaul, in the Roman statue of "the Dying Gladiator," is represented with a torque round his neck. These gold necklaces also are identical in character with the necklaces of chipped and knotted grass, which indicate the origin also of peculiar Burmese necklaces formed of slips of ruddy gold strung together and pendant from a chain which goes round the neck, and from which the jointed strings of gold hang down in front, like a golden veil. The details are often variously modified, the gold being wrought into flowers, or replaced by strings of pearl and gems, until all trace of its suggested origin is lost. By the side of Mr. FitzGerald's collection, I exhibited the "fig-leaf" worn by the women in the wilder parts of India, which in many places is their only clothing. First was shewn the actual "fig-leaf," the leaf of the Sacred Fig, or *pipul*, *Ficus* (now *Urostigma*) *religiosa*; next a literal transcript of it in silver, and then its more or less conventionalised forms, but all keeping the heart-shaped form of the leaf, the surface ornamentation in these conventionalised silver leaves being generally a representation of the *pipul* tree itself—the "Tree of Life" of the Hindu Paradise on Mount Meru. These silver leaves are suspended from the waist, sometimes, like the actual leaf, by a simple thread, but generally by a girdle of twisted silver with a serpent's head where it is fastened in front; and this ornament is probably the origin of the "heart and serpent" bracelets of European jewelry. In Algeria, also, a leaf-shaped silver ornament is worn by girls till they come to an age when more voluminous apparel has to be put on, and, it is the emblem of virginity throughout the Barbary [Berber] coast. The forms of the *champaca* [*Michelia Champaca*] blossom, and of the flowers of the *babul* [*Acacia arabica*] and *seventi* [*Chrysanthemum* species], the name of which is familiar in England through the story of "Brave Seventi Bhai," "the Daisy Lady," in Miss Frere's "Old Deccan Days," are commonly used by Indian jewellers for necklaces and hairpins, as well as of the fruit of the *aonla* [*Phyllanthus Emblica*], and *ambgul* [*Elæagnus Kologa*], and Mango, or *amb* [*Mangifera indica*]. The bell-shaped earring, with smaller bells hanging within it, is derived from the flower of the sacred Lotus; and the cone-shaped earrings of Cashmere in ruddy gold represent the Lotus flower-bed. The use of these flowers in Indian jewelry is possibly not prehistoric, but has come down from an immemorial tradition. The Lotus, which often passes into the *seventi*, is seen everywhere in Indian and Chinese and Japanese decoration, and on Assyrian and Babylonian sculptures.

As primitive as the twisted gold wire forms of Indian jewelry, is probably the chopped gold form of jewelry worn also throughout India, the art of which is carried to the highest perfection in Ahmedabad and Surat, in Western India. It is indeed worn chiefly by the people of Guzerat. It is made of chopped pieces, like jujubes, of the purest gold, flat, or in cubes, and, by removal of the angles, in octahedrons, and strung on red silk, is the finest archaic jewelry in India. The nail-head earrings are identical with those represented on Assyrian sculptures. It is generally in solid gold, for people in India hoard their money in the shape of jewelry; but it is made hollow to perfection in Surat, the flat pieces and cubes and octahedrons being filled with *lac* or *dammar*.

The beaten silver jewelry of the Gonds and other wild tribes in the plains of India, and in the Himalayas, is also very primitive in character, the brooches in particular worn by the women of Ladak being identical with those found among Celtic remains in Ireland and elsewhere. Here the form, a flat and hammered silver band, hooped in the centre, with the ends curled in on the hoop, is too artificial to have arisen independently in India and Europe, and must have travelled with the Celtic emigration from the East, westward. Mrs. Rivett Carnac exhibits an exhaustive collection of the aboriginal and peasant jewelry of India.

The silver filigrain work in which the people of Cuttack have attained such surprising skill and delicacy, is identical in character with that of Arabia, Malta, Geneva, Norway, Sweden, and Denmark, and with the filigrain work of ancient Greece, Byzantium, and Etruria, and was probably carried into the West by the Arabs and Phœnicians, and into Scandinavia by the Normans. In Cuttack the work is generally done by boys, whose sensitive fingers and keen sight enable them to put the fine silver threads together with the necessary rapidity and accuracy.

The waist-belt of gold, or silver, or precious stones, which is worn in India to gird up the *dhoti*, or cloth worn about the legs, recalls the Roman *cingulum*; and, as in Rome, when the ceremony of changing the *toga prætexta* for the *toga virilis* was performed, the *aurea bulla* was taken from the boy's neck, and consecrated to the domestic *Lar*; so, in India, at the ceremony of investiture with the sacred thread, an identical ornament, a hollow hemisphere of gold, hung from a cotton thread or chain of gold, is taken from the boy's neck, and the sacred thread, the symbol of his manhood, put on him.

The *nao-rattan*, an amulet or talisman composed of "nine stones," generally the—

Coral, Topaz, Sapphire,
Ruby, flat Diamond, cut Diamond,
Emerald, Hyacinth, and Carbuncle,

is certainly suggestive also of some connexion with the *urim* and *thummim*, or sacred oracle of the Jews, taken by Chosroes II. from Jerusalem, A.D. 615, and probably still existing among the ruins of one of the old Sassanain palaces of Persia. The *tri-ratan*, is the "tripple gemmed" "Alpha and Omega" symbol of the Buddhists.

The jeweller and goldsmith's art in India is indeed of the highest antiquity, and the forms of the jewelry as well as of the gold and silver plate, and the chasings and embossments decorating them, have come down in an unbroken tradition from the Ramayana and Mahabharata. In the Ganges valley dawned the first light of Aryan civilisation, which spread thence into the valley of the Tigris and Euphrates. The civilisation of Egypt was more ancient, but was undoubtedly largely influenced by Assyria and India, influencing them in turn; and from the earliest ages, as throughout all ages, through the Arabs, Phœnicians, and Armenians, the civilisations of India, Egypt, Assyria, and that of Greece and Rome, have acted and reacted on each other. But the earliest records, the national epics, and ancient sculptures and paintings, represent the forms of Indian jewelry, of Hindu jewelry, and gold and silver plate, and common pottery and musical instruments, and describe their character, exactly as we have them now.

After the archaic jewelry of Ahmedabad, the best Hindu jewelry, of the purest Hindu style, is the beaten gold of Sawuntwari, Mysore, Vizianagram, and Vizagapatam, which well illustrates the admirable way in which the native workers in gold and silver elaborate an extensive surface of ornament out of apparently a wholly inadequate quantity of metal, beating it almost to the thinness of tissue paper, without at all weakening its effect of solidity. By their consummate skill and thorough knowledge and appreciation of the conventional decoration of surface, they contrive to give to the least possible weight of metal, and to gems, commercially absolutely valueless, the highest possible artistic value, never, even in their excessive elaboration of detail, violating the fundamental principles of ornamental design, nor failing to please, even though it be by an effect of barbaric richness and superfluity. This character of Indian jewelry is in remarkable contrast with modern European jewelry, in which the object of the jeweller seems to be to bestow the least amount of work on the greatest amount of metal. Weight is in fact the predominant character of European "high class" jewelry, and gold and silver smith's work. Even when reproducing the best Adams's designs, they spoil their work by making it too thick and heavy; and so demoralising is the rage for weight that English purchasers attracted by the eye to Indian jewelry, directly they find how light it is in the hand refuse it as rubbish; the cost of Indian jewelry being from one-twentieth to one-fourth in excess of its net weight. The jury on jewelry at the Great Exhibition of 1851 actually wrote of Indian jewelry: "It is sufficient to cast a glance "on the exhibitions of India, Turkey, Egypt, Tunis, to be "convinced that these nations have remained stationary from "a very early period of manufacture. Some of them indeed "develope ideas full of grace and originality, but their produc- "tions are always immature and imperfect, and the skill of the "workman is called in to make amends for the inadequateness "of the manufacturing process." Surely it is better to remain stationary than to fall, as we have in England, from the thin beaten silver of Queen Anne's reign, and the designs of Adams, to

the present unseemly dead-weight silver and gold manufactures of Birmingham and London, for which customers have to pay four times and more than the value of their weight. The deceitfulness of its false appearance of richness and solidity, and flaunting gorgeousness is in fact one of the greatest charms of Indian jewelry, especially in an admiring but poor purchaser's eyes. You see a necklace, or whatever ornament it may be, made up apparently of solid, rough cut cubes of gold, but it is as light as pith. Yet, though hollow, it is not false. It is of the purest gold, "soft as wax," and it is this which gives to the flimsiest and cheapest Indian jewelry its wonderful look of reality. Again, you see a necklace or girdle of gems which you would say was priceless, but it is all mere glamour of pearls and diamonds, emeralds, and enamel, which "deceitful shine" but have no intrinsic value. As was noticed under "Arms," the Indian jeweller thinks only of producing the sumptuous, imposing effect of a dazzling variety of rich, brilliant colours, and nothing of the purity of his gems. He must have quantity, and cares nothing for commercial quality, and the flawed "tallow drop" emeralds, and foul spinel rubies, large as walnuts, and mere splinters and scales of diamonds which he so lavishly uses are often valueless, except as points, and sparkles, and splashes of effulgent coloring; but nothing can exceed the skill, artistic feeling, and effectiveness with which gems are used in India both in jewelry proper and the jewelled decoration of arms, and plate. In nothing do the people of India display their naturally gorgeous and costly taste so much as in their jewelery and jewelled arms, which are not only fabricated of the richest and rarest materials, but wrought likewise with all the elaborateness, delicacy, and splendour of design within the reach of art.

The finest gemmed and enamelled jewelry in India is that of Cashmere and the Punjab, the type of which extends across Rajputana to Delhi and Central India, and in a debased meretricious form throughout Bengal; tires, aigrettes, and other ornaments for the head, and hanging over the forehead; earrings and ear-chains, and studs of the *seventi* flower; nose rings, and nose studs; necklaces, made up of chains, of pearls and gems, falling on the breast almost like a stomacher of gems; others, of tablets of gold set with precious stones, and strung together by short strings of mixed pearl and turquoise, with a large pendant hanging from the middle, gemmed in front, and exquisitely enamelled, like all the rest of this necklace, or rather collar, at the back; armlets, bracelets, rings, and anklets; all in never ending variations of form, and of the richest and loveliest effects in pearl and turquoise, enamel, ruby, diamond, sapphire, topaz, and emerald. The bracelets often end in the head of some wild beast, as in the bracelets of the Assyrian sculptures, and the plaques are often enamelled at the back with birds or beasts *affronté* on either side of the taper "Cypress" tree, or else some wide-spreading tree identical, probably, with the *Asherah* or "*Hom*," the symbol of *Asshur*, connected in the Bible with the worship of Astoreth or Astarte, and translated by the word "grove," or "groves." The long dangling necklaces worn by the

women are called *lalanti*, or "danglers," "dalliers," and *mohanmala*, or "garlands (spells) of enchantment."

The jewelry of Cashmere is the same as that of the Punjab in form, but what I have seen of it has been in gold, and the choicest specimens, in "ruddy gold," combining a good deal of gold filigrain work. The enumeration in Isaiah iii, 17–24, of the articles of the *mundus mulicbris* of the daughters of Zion, reads like an inventory of this exceedingly classical looking jewellery of Cashmere. Homer's lines, Il. xxii., 468–70, (describing the grief of Andromache) are, in Pope's translation:—

> "Her hairs' *fair ornaments the braids that bound* [δέσματα σιγαλόεντα],
> The *net* [κεκρύφαλον] that held them, and the *wreaths* [ἄμπυκα] that crowned,
> The *veil* (κρήδεμνον) and *diadem* (πλεκτὴν ἀναδέσμην) threw far away.
> (The gift of Venus on her bridal day.)"

The ἀναδέσμη of Homer, supposed by Schliemann to have resembled one of the gold ornaments found by him at Hissarlik, is almost identical with the ornament of gold pendants, often gemmed, worn across the brow by the women of Cashmere and the Punjab, and indeed all over India, and in Egypt. Those who cannot afford the ἀναδέσμη πλεκτὴ often ornament the front part of the "head band" with imitations of it in spangles and paint. The κεκρύφαλον was the "net" and the κρήδεμνον the "veil" of Pope's translation, but the ἄμπυξ, which he translates by "wreath," and is generally translated by "head band," I have always ventured to suppose was a head ornament similar to the hemispherical golden ornament worn by women, both at Bombay and Cairo, on the top of their heads, of which one sees in collections such fine specimens from Sawuntwari and Vizianagram. The dancing girls ["Bayaderes"] of the Deccan, wear an ornament for the bosom, evidently like the Ægis of Athene, a sort of rich stomacher, with two hemispherical caps of gold to cover the breasts.

The gemmed jewelry of Delhi has lost its native vigour under European influences, but although weak is pretty. The little miniatures, "Delhi paintings," with which some of it is adorned shew that the "limners" of the Mogol's capital have lost nothing of their cunning since Terry so highly praised their skill. They paint not with the brush, but with a pen. The *babul* ornament is not only very pretty, but highly interesting, for it proves that the Phœnician art, so long forgotten in Europe, of soldering gold in grains, which Castellani rediscovered some years ago still practised in an obscure Italian village, has never been lost in India.

The jewelry of Scinde and Baluchistan is similar to that of the Punjab, but usually only in gold and silver. Solid silver torques, and anklets, and bracelets are very common, of a severe style of rectangular construction and ornamentation.

The gold jewelry of Trichinopoly, celebrated among Anglo-Indians, has been corrupted to European taste, but nothing could exceed the technical excellence of the rose-chains and flexible serpent and heart necklets and bracelets.

A great deal of Thibetan jewelry now finds its way into India through Bhotan, Sikkim, Nepaul, and Cashmere, chiefly silver,—

ornamented with large crude turquoises, and sometimes with coral,—in the shape of armlets and necklets, consisting of amulet boxes, one or more strung on twisted red cloth or a silver chain; and in various other forms, bracelets, anklets, &c., hammered, cut, and filigrained. It is identical in character with the jewelry so profusely represented in the Bharhut sculptures. The women of Ladak wear a curious ornament called *parak*, which falls back from the forehead over the head, down the back to the waist. It is covered with precious stones, and the wearer does not marry until she has possessed herself of enough of them to form a goodly *parak*, which in fact constitutes her dowry. The silver Celtic brooch, already noticed, worn in certain of the Himalayan regions is originally Thibetan.

The collection of jewelry in the Prince's presents is scanty, but exceedingly choice. The diamonds are particularly interesting. The Hindus value diamonds in jewelry solely for their decorative effect, but they most extravagantly prize them for themselves as a sort of talisman; and they particularly value them when the natural crystal is so perfect and clear that it requires only to have its natural facets polished. This is what jewellers call a Point Diamond, and there is a good example of one among the Prince's diamonds. If but slightly ground down it is called a Deep Table, or more expressively in French a *clou*. This is a very ancient form of diamond, and there is a perfect example of it in the diamond case. A flat shallow parallelogram is called a *lasque*, of which there are many examples mounted on the arms, although most of them are mere chips and scales. The examples of Rose diamonds and Brilliants are probably of European cutting. The Rose is a hemisphere covered with facets, and the Brilliant, the ancient *clou* cut above with 32 facets and below with 24. There are some fine Hindu necklets of pearls and enamel, and "tallow drop" emeralds; and chains, bracelets, and pendants starred with gems; but the loveliest jewel in the case is a hair comb made at Jeypore. The setting is of emerald and ruby Jeypore enamels painted on gold, surmounted by a curved row, all on a level, of large pearls, each tipped with a green glass bead. Below these lovely pearls is a row of small brilliants, set among the elegantly designed green and red enamelled gold leaves which support the pearls; then a row of small pearls with a brilliant-set enamelled scroll running between it and a third row of pearls, below which is a continuous row of minute brilliants forming the lower edge of the comb, just above the gold prongs. It is most superb in design, and one of the most finished pieces of Indian jewelry that has been made in modern times. The pearls are of very great price, and the whole effect is most brilliant, rich, and refined.

Scindia's great chain of pearls has been an heirloom in his family for generations. Three of the end pearls in a large pendant of flat diamonds and pearls are worthy of the "triple gemmed earrings" [ἕρματα τρίγληνα μορόεντα] of Juno as described by Homer (Il. xiv. 183):

> "Fair beaming pendants tremble in her ear,
> Each seems illumined with a triple star."

And (Od. xviii. 298)

"Earrings bright,
With triple stars that cast a trembling light."

Gem engraving is an immemorial Eastern art, as the cylinders of Nineveh and Babylon and Persepolis testify, and Delhi has always been famous for its practice. Among the Prince's arms will be found a large emerald magnificently cut as a conventional rose. The old Delhi work in cut and gem encrusted jade is priceless. The Chinese had cut jade for ages, but never ornamented it, except by sculpture; but when it was introduced into India the native jewellers, with their quick eye for colour, at once saw what a perfect ground it afforded for mounting precious stones, and they were the first to encrust them on jade. The Indian Museum possesses the choicest and grandest specimens of this work known, of the best Mogol period. They were exhibited at the Paris Exhibition of 1867.

The jewelry of Ceylon in filigrain, chasing, and *repoussé*, is remarkable for the delicacy of its ornamentation in granulated gold, in the style of the antique jewelry of Etruria, and exquisite finish.

Gold beaters' skin (*jilli*) is prepared in India from the scarf skin of the sheep, in large quantity.

Art Furniture and Household Decorations.

If we may judge from the example of India, the great art in furniture is to do without it. Except where the social life of the people has been influenced by European ideas furniture in India is conspicuous only by its absence. In Bombay the wealthy native gentlemen have their houses furnished in the European style, but only the reception rooms, from which they themselves live quite apart, often in a distinct house, connected with the larger mansion by a covered bridge or arcade. Europeans, as a rule, and all strangers, are seen in the public rooms; and only intimate friends in the private apartments. Passing through the open porch, guarded by a room or recess for attendants on either side, you at once enter a sort of ante-chamber, in which a jeweller is always at work making or repairing the family jewels. Through the windows, across the court, the Brahmin cook is seen among the silver drinking vessels and dishes preparing for the mid-day meal. In the opposite verandah, into which you next pass, some young girls are engaged under a matron embroidering silk and satin robes; and at the end of it a door opens and your host welcomes you heartily into his private parlour. He has sent for a chair for you, but sits on the ground himself on a grass mat, or cotton *sattrinji*, or Cashmere rug, with a round pillow at his back, and that is all the furniture in the room. Up country you may pass through a whole palace, and the only furniture in it will be rugs and pillows, and of course the cooking pots and pans, and gold and silver vessels for eating and drinking, and the wardrobes and caskets, and graven images of the gods. But you are simply entranced by the perfect proportions of the rooms, the polish of

the ivory-white walls, the frescoes round the dado, and the beautiful shapes of the niches in the walls, and of the windows, and by the richness and vigour of the carved work of the doors and projecting beams and pillars of the verandah. You feel that the people of ancient Greece must have lived in something of this way; and the houses of the rich in the old streets of Bombay, built before the domestic architecture of the people was affected by Portuguese influences, constantly remind you, especially in their woodwork, of the houses of the Ionian Greeks, as the learned have reconstructed them from their remains: and the woodwork is the essential framework, the solid skeleton, of native houses in Bombay, and is put up complete before a stone or brick is placed on it. The strict rectangular ground plan also of Bombay gardens, and the orderly and symmetrical method in which they are planted, two different species of trees, it may be the Cocoa-nut palm and Mango, or the Cocoa-nut palm and Areca nut palm, being planted alternately all round the boundary, with other trees, Pomegranates, Oranges, Jasmins, Guavas, Roses, Cypresses, Oleanders and Custard-apples, in regular rows and sections, is identical with the ground plans of the ancient Egyptian and Assyrian gardens. Your host has nothing on but a muslin wrapper, for he is about to have prayers performed, and, as he throws the wrapper off his shoulders and head, and girds it round his waist and sits down, a Brahmin enters and places the gods and sacred vessels before him, burning incense, and going through the customary forms and ceremonies; while your friend, if you are interested, explains them in their order. So an hour has passed; a frugal meal, chiefly of unleavened bread and milk, is taken; and then, it being nearly two in the afternoon, an attendant comes in and dresses his master for the Legislative Council, of which he is a member. First he puts on him a soft, close-fitting jacket, and over it a long white cotton robe; then his stockings, of the finest Lille thread, are drawn on, and his feet placed in a pair of elegant French pumps; after which the turband is placed on his head, and a long waistband wound round his waist; and thus arrayed, with a heavily gold-mounted cane in hand, he at last issues forth, clothed, and altogether in another mind, into the outer world of English ideas and fashioning. He will, presently, drive down with you to the Town Hall to talk over the Factories Labour Regulations Bill he is determined to oppose; but meanwhile you must extend your visit also to the drawing-room,—"Which you know you have not seen since I "have had it newly done up for the season." The first glance into it is sufficient to convince the most pampered slave of debilitating comfort, that, in hot climates at least, furniture is a mistake.

Bombay Blackwood.

It is always the same furniture which is to be seen everywhere in these Bombay houses, made of the *shisham* or Blackwood trees (*Dalbergia* sps.), and elaborately carved in a style obviously derived from the Dutch, although it is highly probable that the

excessive and ridiculous carving on old Dutch furniture was itself derived from the sculptured idols and temples which so excited their astonishment when they first reached India. The carving is very skilful, but in a style of decoration utterly inapplicable to chairs, and couches, and tables, and looks absolutely hideous when "French polished," an "improvement" introduced during the last 20 years to suit European taste. When, however, this wood is used for the reproduction of the inlaid wooden doors of old Hindu temples, the effect is always good. It is very finely carved also at Ahmedabad into vases, inkstands, and other small objects, which being generally of pure native or pure classical shape and ornamentation seldom fail to please. I once saw in a Parsi house some stately Blackwood couches, which had been designed in the Assyrian style from Rawlinson's "Ancient Monarchies." The common Jackwood [*Artocarpus integrifolia*] furniture of Bombay, rectangular in its forms, and simply fluted and beaded, is far superior in taste to Blackwood furniture.

Bombay Inlaid Work.

A good deal of ornamental furniture is also made in "Bombay inlaid work," so familiar now in the ubiquitous glove-boxes, blotting cases, book-stands, work-boxes, desks, and card cases, which go by the name of "Bombay Boxes." They are made in the variety of inlaid wood work, marquetry or tarsia called *piqué*, and are not only pretty and pleasing but interesting, on account of its having been found possible to trace (see my paper in the "Journal of Bombay Asiatic Society," vol. vii. 1861–63) the introduction of the work into India from Persia, step by step, from Shiraz into Scinde, and to Bombay and Surat. In Bombay the inlay is made up of tin wire, sandal-wood, ebony, *sappan* (Brazil) wood, ivory, white, and stained green, and stag's horn. Strips of these materials are bound together in rods, usually three-sided, sometimes round, and frequently obliquely four-sided, or rhombic. They are again so arranged in compound rods as when cut across to present a definite pattern, and in the mass have the appearance of rods of varying diameter and shape, or of very thin boards, the latter being intended for borderings. The patterns commonly found in Bombay, finally prepared for use, are *chukur-gul*, or "round bloom"; *kutki-gul*, "hexagonal bloom"; *tinkonia-gul*, "three-cornered bloom"; *adhi dhar-gul*, "rhombus bloom"; *chorus-gul*, "square [matting-like] bloom"; *tiki*, a small round pattern; and *gundirio*, "plump," compounded of all the materials used; *ek dana*, "one grain," having the appearance of a row of silver beads set in ebony; and *pori lihur*, *jafran marapech*, *jeri*, *baelmutana*, *sankru hansio*, and *poro hansio*, these eight last being bordering patterns. The work was introduced into Scinde from Shiraz, about 100 years ago, by three Multanis, Pershotum Hiralal, and the brothers Devidas and Vuliram. A number of people acquired the art under them, and about 70 years ago it was introduced into Bombay by Manoredas, Nundlal, Lalchund, Thawurdas, Rattanji, Pranvalub, and Nar-

rondas, who educated a number of Parsis and Surat men, by whom it was carried to Surat, Baroda, Ahmedabad, and elsewhere. Fifty masters, all of whose names I have recorded, and about 75 apprentices under them, were engaged in the work in Bombay in 1863, of whom Atmaram, Wulleram, and Parshostam Chilaram had been established in the *Kalbadavi* ward ever since its introduction 60 years before. One of the most intelligent craftsmen at present in the trade is Framji Hirjibhai. Tin wire is used in the work instead of brass, as in Persia, where also it is always varnished. The same inlaid work is made in Egypt and Algiers, and it is similar to the tarsia or marquetry of Italy and Portugal, and the Roman work known as *opus cerostrotum*. It is also, I believe, identical with the inlaid work of Girgenti and Salerno, although in this the patterns are floral, and not geometrical, for I found by a comparison of the two varieties in Paris, that there was not a single geometrical pattern in the Bombay work which cannot be traced back to a flower in the work of Girgenti and Salerno. The Egyptians also obviously worked in tarsia. The art is said to have died out of Europe, and to have been again reintroduced at Venice from the East. More probably it remained an unbroken tradition in the Mediterranean, and was revived by the Saracens. At Goa, rare old caskets, coffers, and other examples of it, of the same style as the Portuguese 16th and 17th century tarsia, and evidently the *chef d'œuvres* of patient Hindu hands, are sometimes to be found by the insidious *virtuoso*, but otherwise there is not a trace of it in India, except what has come during the last 110 or 120 years from Persia.

Vizagapatam Work.

Vizagapatam work, in ivory and stag's horn, is applied to the same class of articles as Bombay work. It is of very recent origin, and the etching in black, *sgraffito*, on the ivory, is exclusively of European flower forms, represented naturally, in light and shade. The effect is most unpleasing.

Mynpuri Work.

In Mynpuri work, which is analagous to buhl-work, we find boxes and platters of a rich brown wood inlaid with brass wire in various geometrical and scroll patterns. Sir John Strachey, who has given great encouragement to this local industry, exhibits several examples of it. It is curiously like the wood inlaid with wire seen in Morocco, and it would be interesting to inquire after the history of its introduction at Mynpuri, where it goes by the name of *tarkashi*, or "wire work;" a word which suggests the possible etymology of the word *tarsia*.

Inlaid Work of Agra.

The inlaid work of Agra, a mosaic of crystal, topaz, pearls, turquoise, carnelian, jade, coral, amethyst, blood-stone, carbuncle, sapphire, jasper, lapis-lazuli, garnets, agates, and chalcedony on white marble, is also chiefly applied to ornamental furniture

and household *objets d'art*. It originated in the exquisite decorations of the Taj at Agra by Austin de Bordeaux, and, after almost dying out as a local industry, on the dissolution of the Mogol Empire in 1803, was revived about 30 years ago through the exertions of Dr. J. Murray, late Inspector General of Hospitals, Bengal. Nearly all the specimens of this work in England, at Windsor and elsewhere, were produced under his fostering care. While Florentine in origin and style, the designs have a thoroughly local character of their own, and, unless influenced by injudicious European direction, adhere strictly to the principles and methods of Indian ornamentation. The mosaic, being laid on the brilliant white marble of Jeypore, is liable, however, to look vulgar, unless the stones used for it are very judiciously selected.

Mosaic obviously originated in pavement, and the introduction of ornamented pavement was probably suggested by oriental tapestry. A pavement, *pavimentum*, is strictly a flooring [δάπεδον, whence δάπις, and τάπης, a carpet or rug,—laid on the *floor*] or *stratum*, composed of flags, slabs, or pebbles, bricks, tiles, or shells, set in a cement, and beaten down [*pavio*] with a rammer or *pavicula* ; and the classical writers [Pliny, Bk. xxxvi.] distinguish pavements by different names, according to their situation, structure, and decoration.

The paved floors of rooms and passages were designated *pavimenta subtegulanea*, and pavements in the open air, particularly those laid on the flat roofs of houses, *pavimenta subdialia*. The *pavimentum sectile* was composed of different coloured marbles cut (*secta*) into regular forms, such as *favus*, like the cells (hexagons) of a *honey-comb ; trigonum*, triangular ; *scutula*—rhomb-shaped ; and *tessera*, with its diminutive *tessella*, a cube.

All these forms might be not only of cut marble or other stone, but of glass or other composition. The *abaculus* [ἀβακίσκος] was a small tile or die [*tessera*] of glass, or other composition, stained of various colours in imitation of precious stones.

The *pavimentum tessellatum*, or *tesseris structum*, was a sectile pavement, composed of large *tesseræ*.

The *pavimentum vermiculatum* was composed of smaller *tesseræ*, arranged, not in diapers and geometrical figures, but so as to represent natural objects, as in pictures, by lines of embedded *tesseræ*, which necessarily turned and twisted about like the tracks of worms. This vermicular mosaic was divided into *opus majus*, composed of larger *tesseræ*, *opus medium*, of smaller, and *opus minus vermiculatum*, composed of very minute and delicate *tessellæ* —almost *spiculæ*.

In the *pavimentum scalpturatum*, the marble was cut out in the shape of the figures intended to be represented in the mosaic, and was further engraved after the manner of the Triqueti marbles in the Albert Memorial Chapel at Windsor.

The *pavimentum testaceum* was composed of broken tiles or potsherds.

The *pavimentum lithostrotum*, literally stone *stratum* or street, was the ordinary pavement of Roman roads, laid with polygonal blocks or flags of silicious lava.

The *pavimentum optostrotum*, literally baked [ὀπτός, *coctus*] *stratum* or street, was a pavement of bricks. Often the oblong bricks were laid in imitation of the setting of the seed grains in an ear or spike of corn, [*spica testacea*], or, as we say in England, herring-bone ways, as may be seen in the walls of Pevensey Castle and other old Roman masonry.

Gradually the word *lithostrota* came to signify Mosaics in the modern sense exclusively. Thus Pliny [Bk. xxxvi., ch. 25, says:—"Pavimenta originem apud Græcos habent elaboratâ arte, "picturæ ratione, donec lithostrota expulere eam."

Again, the Greek word for Mosaic, ψήφωσις from ψῆφος a pebble, also indicates the origin of the art in pavement. The word Mosaic is said by Hendrie to be derived from the Arabic *mosque*, but it came into use long before the rise of the Saracens. It is first used by Ælius Spartianus, one of the "Scriptores Historiæ "Augustæ," in the biography of Pescennius Niger, A.D. 293; and later by Trebellius Pollio, A.D. 320; and Aurelius Augustus, A.D. 430; and the word is clearly from the Greek μουσεῖον, a temple of the Muses; Latin, *Musium*, *Musivum opus;* Italian (through the Greek, and not Latin), *mosaico*; Spanish, *mosaico*; French, *mosaique*, and so English, mosaic.

The *Alexandrinum opus* of the third and fourth centuries A.D. was a mosaic pavement laid in elaborate geometrical figures, and the direct forerunner of the characteristic arabesque work of the Saracens. By mosaic proper, *Musivum opus*, has always been understood a picture or other ornamental design formed of small pieces of marbles or other stones, or of glass or other composition, used chiefly for the decoration of walls and ceilings, and personal ornament. This is indicated by the specific Greek name for true mosaic, ψῆφοι χρύστεοι, evidently referring to the use of gilded glass *tesseræ* in the Mosaics of the Byzantine period, the manufacture of which [tesseræ] is so lucidly described by Theophilus the Monk (10th–12th cent. A.D.), Bk. II., ch. xv.—"De vitro "Græco quod Musivum opus decorat."

"Vitreas etiam tabulas faciunt opere fenestrario ex albo vitro "lucido, spissas ad mensuram unius digiti, findentes eas calido "ferro per quadras particulas minutas, et co-operientes eas in uno "latere auri petula, superliniunt vitrum lucidissimum tritum ad supra. Hujusmodi vitrum interpositum Musivum opus omnino decorat."

The earliest notice of mosaic is in the Bible in the story of Esther (*circa* B.C. 450), where, in the account (ch. 1) of the six months' feasting held by Ahasuerus (Xerxes) to arrange the third invasion of Greece, we are told (v. 6) in the description of the palace of Shushan, "the bedswere of gold and silver, upon a pave-"ment of red [porphyry], and blue [lapis-lazuli], and white "[alabaster], and black marble." Mosaic pavements have not been found in the remains of Egyptian, Babylonian, and Assyrian temples and palaces, but true mosaics have been found as a decoration of mummy cases. The Greeks carried the art to marvellous perfection, and Pliny naturally enough ascribes its origin to them. He particularly mentions the *pavimentum asarotum* of the Greek

artist Sosus of Pergamus, representing the remains of a banquet, shown on an apparently unswept [ἀσάρωτος] floor. "The doves of Pliny," represented with one drinking, and others sunning and pluming themselves round the rim of the drinking bowl, are universally known through the copies which have been reproduced of them in all ages and countries. The most interesting and valuable of all the ancient pictorial mosaics which have been preserved to our time is the one which was found at Pompeii, in "the house of Pansa," representing the battle of Issus. The mosaics of the classical period are severe in design and chaste in colouring, but, as the influence of Indian art gradually spread over the Mediterranean countries, rich colours and even gold were gradually more and more introduced into the mosaics of the Lower Empire, and give them their distinctive character.

After the fall of the Western Empire the art seems to have perished out of Italy, until it was revived in the 13th and 16th centuries, and the revival was through the Byzantine Greeks, as is indicated by the Greek form of the Italian word *mosaico*.

The Saracens had from the first used glazed tiles for covering walls and roofs and pavements, and of course with a view to decorative effect. The use of these tiles had come down to them in an unbroken tradition from the times of the Chaldean monarchy, the Birs-i-Nimrud, or Temple of the Seven Spheres at Borsippa, near Babylon, of the pyramid of Sakkara in Egypt, and of the early trade between China and Egypt and the valley of the Tigris and Euphrates. Glazed tiles had, however, fallen into comparative disuse in the East before the rise of the Saracens, and it was the conquests of Chingiz Khan, A.D. 1206–27, which would appear to have brought about their general use throughout the countries of Islam. That the Saracens indeed derived the art of true mosaic direct from the Greeks is proved by their calling it *sephisa*, from the Greek ψήφωσις. When the Caliph Walid invaded Palestine, one of the conditions of peace he made with the Cæsar at Constantinople was that he should furnish a certain quantity of *sephisa*, which he had seen in the church at Bethlehem built by the Empress [St.] Helena, for the decoration of the mosque he was building at Damascus.

The use of inlaid stone in true mosaic work by the Mongols in India, was principally due to the revival of the ancient art in Italy. The Italians of the Renaissance developed two distinct forms of inlaying in stone, the Roman mosaic of modern jewellers which may be compared to the *opus minus vermiculatum*, and the Florentine, composed of thin slices of different coloured stones, chiefly quartzose, cut to the shape of the form they are intended to represent, the petal of a flower, the wing of a bird, or whatever it may be, and set in white or black marble with cement, of which in good work not a trace should appear between the encrusted stones and the marble, not even when seen through a magnifying glass. It was this, Florentine, form of mosaic in *pietra dura* which was used by *Austin de Bordeaux* in the decoration of the glorious Taj-Mahal, and which has become naturalised as a local art at Agra. Austin's earlier work at Delhi appears to have been

purely imitative, as may be seen from several specimens of it now in the India Museum. The mosaic representing Orpheus is interesting, from its being supposed to be a portrait of Austin himself. It was looted at the recapture of Delhi from the mutineers in 1857, and was purchased for the India Museum from Sir John Jones. At present the chief inlayers at Agra are two Hindus named Nathu and Purusram. The *pavimentum Græcanicum* of Pliny was a concrete composition of charcoal, sand, lime, and ashes, rammed down and polished to represent black marble. Omitting the charcoal, this is pretty much the composition of the "*chunam*" walls and floors, in imitation of white marble, which are seen all over India in superior houses, and in the Madras Presidency in particular are remarkable for their high polish and real look of white marble. The commoner *chunam* stucco made of *kankar* and pounded sand, is indeed the Roman *arenatum*, and the finer sort, in which pounded marble or calc-spar is substituted for sand, is the Roman *marmoratum*. When this stucco is decorated in various designs, as a sort of false mosaic, it may be compared to the painting in coloured plasters which has long been recognised in Europe as a special art. In *al fresco* painting the colours are soaked into the plaster, while it is still damp, and thus the design is indelibly fixed to the hardening surface. In *a tempera* painting the colours, mixed with size to make them adhere, are put on the plaster after it has hardened. Often the background of a composition is painted in *al fresco*, and the figures of the foreground in *a tempera*. When the plaster is etched, in a manner resembling the *pavimentum scalpturatum*, the work is called *sgraffito*. The term encaustic painting, now used only for the painting of glazed tiles, was first applied to *a tempera* painting, in which the vehicle of the colours used was wax, spread over the surface of the stucco with a heated iron, or "actual cautery."

Sandalwood and other Wood Carving.

Sandalwood carving is chiefly carried on in the Bombay Presidency, at Surat, Ahmedabad, Bombay, and Canara. It is applied to the same articles as the Bombay inlaid work. Indeed the generic term "Bombay Boxes" includes Sandalwood carving as well as inlaid work, but wood carving is a far superior art to inlaying, and in India is as ancient as the temple architecture and the carved idols in which it probably originated. The Surat and Bombay work is in low relief, and the designs consist almost entirely of foliated ornament; the Canara work is in high relief, the subjects being chiefly mythological; and the Ahmedabad work, while in flat relief, is deeply cut, and the subjects are mixed floral and mythological; for instance, Krishna and the Gopies, represented not architecturally as in Canara carving, but naturally, disporting themselves in a luxuriant wood, in which each tree, while treated conventionally, and running into the general floral decoration, can be distinctly recognised. A line is drawn below the wood, and through the compartment thus formed a river is represented flowing, as on Greek coins, by an

undulating band, on which tortoises and fishes and waterfowl are carved in half relief.

Sandalwood is also carved in Mysore, in the Canara style, and a little at Moradabad, in the North-West Provinces, and at Bhurtpur; and Ebony is excellently carved at Bijnur in geometrical designs, generally applied to fancy boxes, and also at Monghyr. Latterly these ebony boxes have been inlaid with ivory, as in the old Sicilian tarsia work. Idols are carved in various woods all over India.

Carved Ivory and Horn.

Ivory is carved all over India, but chiefly at Amritsar, in the Punjab; at Benares, Behrampore, and Murshedabad, in Bengal; and at Travancore, Vizagapatam and Vizianagram, in Madras. The subjects are generally richly caparisoned elephants, state gondolas in gala trim, tigers, cows, and peacocks, carved as statuettes, and hunting, festive, and ceremonial scenes, and mythological subjects carved in relief. The carved ivory combs found in every Indian bazaar are also most artistic in form and detail. Bisons' horn is carved into figures and otherwise wrought at Sawuntwari and elsewhere.

Carved Stone.

The agate vases of Baroach and Cambay have been famous, under the name of Murrhine vases, from the time of Pliny. Animals are carved in black marble at Gya, and in white marble and reddish sandstone at Ajmere and in other parts of Rajputana, in which we find the same truth of representation as in the ivory carvings of Benares and Travancore. In Rajputana also idols are largely carved in white marble and brilliantly coloured in red and green paint and gold. Jade is still carved in Cashmere, and Potstone in various parts of India, and a soft soapstone at Fatehpur Sikri.

Clay Figures.

Figures in clay, painted and dressed up in muslins, silks, and spangles, are admirably modelled at Kishnaghur, Calcutta, Lucknow, and Poona. Fruit is also modelled at Gokak, in the Bombay Presidency, and at Agra and Lucknow. The Lucknow models are so true to nature as to defy detection until handled.

It is very surprising that a people who possess, as their ivory and stone carvings and clay figures incontestably prove, so great a facility in the appreciation and delineation of natural forms should have failed to develop the art of sculpture. Nowhere does their figure sculpture shew the inspiration of true art. They seem to have no feeling for it. They only attempt a literal transcript of the human form, and of the forms of animals, for the purpose of making toys and curiosities, almost exclusively for sale to English people. Otherwise they use these sculptured forms only in architecture, and their tendency is to subordinate them strictly to the architecture. The treatment of them rapidly becomes con-

ventional. Their very gods are distinguished only by their attributes and symbolical monstrosities of body, and never by any expression of individual and personal character.

So foreign to the Hindus is the idea of figure sculpture in the æsthetic sense, that in the noblest temples the idol is often found to be some obscene or monstrous symbol. How completely their figure sculpture fails in true art would be seen at once if they attempted to produce it on the natural or heroic scale; and it is only because their ivory and clay and stone figures of men and animals are on so minute a scale that they excite admiration. Their larger figure sculpture is indeed never pleasing, except when treated conventionally. It is a strange failing.

Lac Work.

Lac work is a great and widely extended industry in India. The higher class work, applied to furniture and house decorations, is centred only in the great towns, but the making of variegated lac marbles, and walking sticks, and lac mats is carried on even by the wandering jungle tribes. The variegated balls and sticks are made by twisting variously colored melted sealing wax round and round the stick or ball from top to bottom in alternate bands. Then the object is held before the fire, and with a needle or pin short lines are every here and there drawn perpendicularly through the bands of sealing wax, drawing the different colours into each other, when the stick or ball is rapidly rolled on a cool, smooth surface, and that intricately variegated effect is produced which is so puzzling until explained. The netted mats are made by allowing the thread of sealing wax twisted round a stick to cool, and then drawing the whole coil off, and breaking it into sections of three or four turns each, which are linked together into "mats" of all sorts of variegated colours, but chiefly scarlet and black, and black and golden yellow. I describe the process from actual observation.

The *Scinde* boxes are made by laying variously colored *lac* in succession on the boxes while turning on the lathe, and then cutting the design through the different colours. Other boxes are simply etched and painted with hunting scenes, or natural or conventional flowers, and varnished.

The *Punjab* boxes are distinguished by the purple-colored *lac* used on them.

The *Rajputana* boxes have generally a drab ground, decorated with conventional, almost geometric flower forms, of two colours, or two forms arranged in the alternate rythmical manner which is seen throughout all Indian decoration.

The lacquered *papier maché* of *Cashmere* is the choicest in India, and only inferior to the very best Persian. It is applied to native pen cases and boxes in two styles of decoration; the shawl (cone) pattern, which is done in many colours, and is not pleasing on large objects, such as tables and chairs; and, flower pattern, the rose, narcissus, pink, and jasmine, drawn in their natural form and colour, but without light and shade.

The lacquer work of *Karnul*, applied to large trays and boxes, is embossed with flowers, painted generally on a green ground, and lighted up with gold.

The lacquer work of *Sawuntwari* is applied to native toys, such as models of hand-mills, weights and measures, cooking utensils, and vessels for eating and drinking, and to the peculiar fans of the country, and Hindu playing cards. These last are circular, and being painted with mythological subjects in bright colours, are most pleasing objects, and interesting also as illustrating the state of the art of painting in India, in districts where it has remained uninfluenced by European teaching and example.

In *Mysore*, and elsewhere in the Deccan, there is a sort of lacquer-ware in which the ground is painted in transparent green on tin foil, and the subjects, generally mythological, being painted on this shining background in the brightest opaque colours, the effect has almost the brilliancy of the jewelled enamels of Jeypore.

Miscellaneous.

Paintings on Talc are chiefly sold at Patna, Benares, and Tanjore. *Delhi paintings* on ivory, in the style of European miniatures, have been already mentioned under jewellery. They are often of great merit, especially as decorative paintings, and the first Delhi painter in my time in Bombay was Zulfikar Ali Khan, on whose work I officially reported to the Government of Bombay in 1863, and who I find from Lieut. F. Cole's invaluable catalogue of the objects of Indian Art exhibited in South Kensington Museum, sent the best miniatures to the Annual International Exhibitions of 1871–72.

Trinketry.—In all parts of India imitation jewelry is made. In Dacca, also, bracelets are made from chank shells, imported from the Maldive and Laccadive islands. They are sawn into semi-circular pieces which are joined together, and carved and inlaid with some red composition. At Poona and other places bracelets and necklaces and chains are made of some sort of perfumed composition, and also of various seeds, as the scarlet and black seeds of the *ganja* or *gunch* [*Abrus precatorius*], the flat black seeds of the *talapota* or *turwar* [*Cassia auriculata*], the red seeds of the *rukta chundun* or Red Saunders [*Adenanthera pavonina*], the mottled seed of the *supari* or betel-nut palm [*Areca Catechu*], the oval seeds of the *bhirli mar* [*Caryota urens*], and the deeply sulcated seeds of the *rudrach* [*Elœocarpus Ganitrus*], which are also worn as a necklace by the Brahmins and *fakirs*.

Feathers.—At Poona, peacock's feathers and *cuscus* are made up with beetle wings and spangles into fans and mats.

Leather.—Curious toys, figures, and artificial flowers are made by a single family of the shoemaker [*muchi*] caste at Nursapore in the Godavery district. They are very like those made at Condapilly in the Kistna district.

In India shoes are valued not so much for the soundness of their leather as the beauty of their ornamentation; and formerly a great

industry of gold embroidered shoes flourished at Lucknow. They were in demand all over India, for the native kings of Oudh would not allow the shoemakers to use any but pure goldwire in their work. But, when we annexed the kingdom, all such restrictions were removed, and the bazaars of Oudh were at once flooded with the pinchbeck embroidered shoes of Delhi, and the Lucknow shoemakers' occupation was swept away for ever by the besom of free trade. In the Punjab, *huka* stands, water bottles, and other articles of household use are wrought of plain leather, ornamented with strips of green leather and bright brass mountings. In Guzerat beautifully embroidered leather mats are made. It is indeed quite impossible to enumerate all the smaller village wares of India, although they are the most interesting of all, illustrating as they do the infinite variety in unity of the decorative art of India.

These ephemeral wares, as well as the more important ones mentioned under this class, are all illustrated in the collection of the Prince of Wales' Indian presents, down to the artificial flowers made with the pith of the *sola*, or *Æschynomene aspera*, of which also the Sun Hats worn by Europeans in India, and called Solar *topis* by a natural corruption of the native name of the pith, are made. Only four objects, however, need particular mention. The ivory bedstead [compare Od. x, 12, τρητοῖς λεχέεσσιν] from Travancore illustrates the excellence of the ivory turning and carving in that native State. It would in a hot climate convey an idea of delightful coolness, and in this respect will recall to the mind of those who have seen it the deep-seated couch of carved Jeypore white marble, which belonged to Earl Canning, and is now possessed by Mr. Wentworth Beaumont. The silver throne was presented by a sort of penny subscription by the priests of Madura. It is a striking object, in form of course European, but the strange, barbaric ornamentation is reproduced directly from the architectural details of the celebrated temples of this city of famous Hindu shrines. The harmony of the composition has, however, been violently outraged by the flaring magenta French satin used in the upholstery of the throne. The bedstead of graved parcel gilt silver, with red and yellow hangings of needle-worked embroidery, is one of the many splendid gifts of the Maharajah of Cashmere. It is very picturesque in outline, and when placed on its blue and red silk carpet, quite Titianesque in colour. The ivory and ebony palanquin of Vizagapatam work is the gift of the Princess Bobili. The effect of the ebony through the pierced ivory makes it a pleasing object at a distance. It is very richly and prettily furnished inside. Among the toys are two models of chariots, one drawn by cream coloured bullocks, and the other by cream coloured horses, which look as if they had just stepped out from an illuminated page of the Ramayana or Mahabharata.

Trappings and Caparisons.

All Indian exhibitions are overloaded with gaudy trappings, and state caparisons and housings, horse cloths, and elephant cloths, howdahs, and high umbrellas, peacock tails and yak tails.

They look very brave in procession through the narrow streets thronged with the gay crowd, advancing tumultuously between the high overhanging houses, painted story over story, in red, and green, and yellow, like macaws: or when the Mahratta princes and their whole court go forth in high gala, with trumpets, and with shawms, high shrilling pipes, and belaboured *tom-toms*, into the jungle, to do homage at the *Dussera* festival to the *palas* or *Butea frondosa;* returning everyone with his hands full of its yellow flowers, to offer as gold before the idols in the wayside village temples: but here they are interesting solely for the designs often to be found on the metal work, and for the manner in which cut cloth work, *opus consutum,* or *appliqué* as it is termed by the French, is used in their ornamentation; and also for the general resemblance which they bear to the horse trappings seen in Italy, and in the sculptures of Egypt and Assyria. *Chauries* of Yak tails, and Peacock feathers, *murchals* are regarded as the most august insignia of royalty in the East. The Prince has a pair of each of these regal symbols, mounted elaborately on jewelled and enamelled handles. Many visitors will have seen the peacock feathers borne before Leo XIII. at his enthronment, and no doubt their use by the Popes of Rome was derived at some distant date from the East. To put jewels and enamel on peacock's feathers would seem like adding another hue unto the rainbow, but there is no "wasteful and ridiculous excess" in the masterly way in which the Jeypore artist has used the feathers, and gems, and his enamels to mutually enhance each other's effect in these pompous *murchals*. Nothing can be richer than his materials, nothing more harmonious and effective than the manner in which he has combined them. The silver *howdah* belonging to the Prince is interesting merely for its picturesque silhouette.

Musical Instruments.

Indian musical instruments are remarkable for the beauty and variety of their forms, which the ancient sculptures and paintings shew have remained unchanged during the last two thousand years. The harp *chang* is identical in shape with the Assyrian harp represented on the Niniveh sculptures, and the *vina* is of equal antiquity. The Hindus claim to have invented the fiddle-bow.

Woven Stuffs, Felts, Fine Needlework, and Carpets.

The embroidery, and cotton, silken and woollen tissues and stuffs, and the carpets in the Prince's collection are very disappointing. The Tanjore and other Madras carpets are commonplace, and very inferior; and, with the other textile fabrics, betray the increasing use of the Magenta dyes, and prevalence of French and Manchester designs. The few Cashmere shawls shewn, however, are superlatively fine, some of the usual shawl-pattern, and others snuff-colored, of softest texture, inwrought with gold. One is worked with a map of the city of Srinagar, the capital of Cashmere; the streets and houses, gardens and temples, with the

people walking about among them, and the boats on the deep blue river, seen as clearly, in the quaint drawing of a mediæval picture, as in a photograph. Another shawl, more soberly colored, is one mass of the most delicate embroidery, representing the conventional Persian and Cashmere wilderness of flowers, with birds of the loveliest plumage singing in the bloom, and wonderful animals stalking about, and wondering men.

There are also several pieces of the finest Dacca muslin, of which one kind, *mulmul-khas*, is so fine that a piece of it, many yards in length and a yard in width, can be passed through a finger ring, or put into a round ivory case not much larger than an egg-shell. The muslins from Benares are figured with gold, on a ground of white, black, brown, or purple. There are many rich brocades—*kincobs*—from Benares and Ahmedabad, of shining dyes and stiff with gold, and Delhi and Scinde and Cutch embroideries. In one of the cases is hung the most glorious *kincob* ever seen in Europe. It is of Ahmedabad work, rich with gold, and gay with colours, and was presented to the Princess of Wales by the young Guicowar of Baroda. The stuff called *soniri*, or "golden," is richer still, but is not ornamented with a coloured border, it is simply cloth of gold. *Ruperi* is made in the same way with silver, and was doubtless the fabric in which Herod was arrayed when enthroned before the people, in the full blaze of the sun, they hailed him as a god [Josephus, "Antiquities," xix. viii. 2]. The fur-lined jackets of silk, trimmed with gold braid, are very charming, and most tasteful in design. Weaving was probably first of all countries perfected in India, and the art of its gold brocades and filmy muslins, "comely as the curtains of Solomon," is even older than the Code of Menu. Weaving is frequently alluded to in the Vedas in such passages as these—"Cares consume "me as a rat gnaws a weaver's thread," and "Day and Night "spread light and darkness over the extended earth like two famous "weavers weaving a garment." In the Ramayana the description of the nuptial presents to Sita, the bride of Rama, from her father, of the precious stones, and princely jewelry, woollen stuffs, fine silks, vestments of divers colours, furs, and sumptuous ornaments of all kinds, reads like the inventory of the Prince's presents here exhibited 2000 years later. No conventional ornament is probably more ancient than the colored stripes and patterns we find on Indian cotton cloths and carpets called *sattringis*. In the *kincobs* the ornamental designs betray conflicting influences. It is very difficult to say when silk weaving passed from China into India, and it would appear as if there were no conclusive evidence of its having been known in Western Asia until Justinian introduced it from China through Persia in the sixth century. But there is no doubt that the brocades of Ahmedabad and Benares and Murshedabad represent the rich stuffs of Babylon, wrought, as we know they were, with figures of animals in gold, and variegated colours. Such brocades are now a speciality of Benares, where they are known under the name of *shikargah*, happy "hunting grounds," which is nearly a translation [Yule, "Marco Polo," i. 63] of the name *thard-wahsh*, or "beast hunts," by which they were

known to the Saracens. Fine weaving probably passed from India to Assyria and Egypt, and through the Phœnicians into Southern Europe; and gold was inwoven with cotton in India, Egypt, Chaldæa, Assyria, Babylonia, and Phœnicia, from the earliest times, first in flat strips, and then in wire, or twisted round thread, and the most ancient form of its use is still practised all over India. In Exodus xxxix, 2 and 3, we read: "And he [Aholiab] made "the ephod of gold, blue, and purple, and scarlet, and fine twined "linen. And they did beat the gold into thin plates, and cut it "into wires" ("strips" it should be translated), "to work it in the "blue and in the purple and in the scarlet, and in the fine linen, "with cunning work." The inspired Psalmist, in setting forth the majesty and grace of the Kingdom of God [Psalm xlv.], says, "Upon thy right hand did stand the Queen in gold of Ophir. * * * The King's daughter is all glorious within, her raiment is of wrought gold." Almost at the same time Homer describes the golden net of Hephæstus (Od. viii, 274):

> "Whose texture e'en the search of gods deceives,
> Fine as the filmy webs the spider weaves."

Pliny (Bk. viii. ch. 74) also tells us, "But to weave cloth with gold "was the invention of an Asiatic King, Attalus, from whom the "name Attalic ("*Attalica vestis*," "*Attalica tunica*," "*Attalicus torus*") was derived, and the Babyloniams were most noted for their skill in weaving cloths of various colours. Of course the excellence of the art passed in the long course of ages from one place to another, and Babylon, Tarsus, Alexandria, Baghdad, Damascus, Antioch, Tabriz, Constantinople, Cyprus, Sicily, Tripoli, successively became celebrated for their gold and silver wrought tissues, and silks and brocades. The Saracens, through their wide spreading conquests and all devouring cosmopolitan appetite for arts and learning—at second hand—succeeded in confusing all local styles together, so that now it is often difficult to distinguish between European and Eastern influences in the designs of an Indian brocade: and yet through every disguise it is not impossible to infer the essential identity of the brocades of modern India with the blue and purple and scarlet worked in gold of ancient Babylon.

Such a brocade was doubtless "the goodly Babylonish garment" which tempted Achan in Jericho, and the Veil of the Temple at Jerusalem, which Josephus describes "as a πέπλος Βαβιλώνιος of "varied colours marvellously wrought." Col. Yule ["Marco Polo," i. 62], in the place just cited, also writes: "From Baudas or "Baldac, *i.e.*, Baghdad, certain of these rich silk and gold bro-"cades were called *Baldachini*, or, in English, Baudekins. From "their use in the state canopies and umbrellas of Italian digni-"taries, the word Baldacchino has come to mean a canopy, even "when architectural." Cramoisy derives its name from the Kermes insect, which before the introduction of cochineal from America, in 1518, was universally used for dyeing scarlet. It is the *tola* of Moses, wherewith the hangings of the Tabernacle and sacred vestments of the Hebrew priesthood were "twice dyed." Sardis was celebrated for this scarlet dye, as were Tyre and Crete

for their lustrous purples, the Tyrian being obtained from a shell fish, as was also the red of Tarentum, and the Cretan tincture from a plant which Theophrastus, Dioscorides, and Pliny respectively call *τὸ πόντιον φῦκος, φῦκος θαλάσσιον, phycos thalassion*, but which was, however, not a seaweed, but a lichen, identical probably with one of the species from which the Orchil purple of modern art is prepared. That the celebrated "purple" of the ancients was amethystine or violet in hue, and not red, is directly proved by their comparing the Tyrian with the Cretan purple, the latter of which they considered the more brilliant. Herodotus tells of the admiration of Darius for the "scarlet cloak" [Rawlinson, *χλανὶς πυρρά*—"*amiculum rutilum*" Latin translation] of Syloson, the Samian, the fiery colour of which was probably derived from Kermes, and which certainly would not have excited the cupidity of Darius had the dye of Tyre been red. From the Arabic name of the insect, *kirmij*, comes not only *cramoisy* and *carmine*, but also *vermeil, vermilion*. The Arabs received both the insect and its name from Armenia, and *kirmij* is derived from *quer mes*, and means originally "oak berry." Dioscorides describes it under the name of *κόκκος βαφική*; and Pliny says of it, "est autem genus "ex eo in Attica fere et Asia (Proconsulari) nascens, celerrime "in vermiculum se mutans, quod ideo solecion vocant" [xxiv. 4]. *Vermilion* is undoubtedly the same word as *vermiculum*. *Vermiculum*, in fact, in the middle ages, signified Kermes, "and on "that account cloth dyed with them was called vermiculata," and in England formerly "vermilions." The French term *vermilion* also originally signified Kermes, and from it was subsequently transferred to red sulphuret of mercury or cinnabar, a pigment known from the earliest times, it being mentioned by Jeremiah in his description of a house "ceiled with cedar "and painted with vermilion" [ch. xxii. 14]; and by Ezekiel [xxiii. 14], when referring to the carvings of "men por- "trayed upon the wall, the images of the Chaldæans portrayed "with vermilion," which portraitures in carving and in paint have survived to our time.

Textile fabrics frequently take their names from the place where they first acquired excellence, and retain them long after the local manufacture has been transferred elsewhere, and sometimes the name itself is transferred to altogether another style of manufacture. Thus, beside Baudekin from Baghdad, we have Damask from Damascus, and Satin from Zaytoun in China [Yule]. Sindon, Syndon, Sendal, Sandalin, and Cendatus, from Scinde, Calico from Calicut, and Muslin from Mosul. Marco Polo, Book I. ch. v., of the kingdom of Mosul, writes, "All the cloths of gold and silver that "are called *Mosolins* are made in this country; and those great "Merchants called *Mosolins* who carry for sale such quantities of "spicery and pearls, and cloths of silk and gold, are also from this "kingdom." In his note (vol. i. p. 59) Colonel Yule observes: "We see here that *mosolin* or muslin has a very different meaning "from what it has now. A quotation from Ives, by Marsden, "shows it to have been applied in the middle ages to a strong "cotton cloth made at Mosul. Dozy says that the Arabs use

"*Maucili* in the sense of muslin." Tartariums, Colonel Yule ["Marco Polo," i. 259] believes, were so called, "not because they "were made in Tartary, but because they were brought from "China through the Tartar dominions." Dante alludes to the supposed skill of Turks and Tartars in weaving gorgeous stuffs; and Boccacio, commenting thereon, says that Tartarian cloths are so skilfully woven that no painter with his brush could equal them. Thus also Chaucer, as quoted by Colonel Yule:

> "On every trumpe, hanging a broad banere
> Of fine *Tartarium*."

This is the cloth of gold which Marco Polo calls *Nasich* and *Naques*, and he evidently describes the primitive working of gold in strips into it where, Book II. ch. xiv., he writes: "Now on his birth-"day, the Great Khan dresses in the best of his robes, all wrought "in beaten gold." Buckram is said to be derived from Bokhara. The word occurs (Yule, "Marco Polo," i. 59) as *Bocharani*, *Bucherani*, and *Boccassini*. Fustian is said to be derived from Fostat, one of the mediæval cities that form Cairo, and Taffeta and Tabby from a street in Baghdad. Baden Powell, however, in his list of cotton fabrics met with in the Punjab ["Punjab Manufactures," vol. ii. p. 22], names *taftá* a fabric of twisted thread, made both in silk and cotton; and *tafta* in Persian means twisted, as *bafta* means woven. Perhaps the manufacture gave its name to the street in Baghdad where it was made. Cambric is from Cambray; Sarcenet from the Saracens; Moire and Mohair from the Moors. Diaper is not, however, from d'Ypres in Flanders, but from a Low Greek word διασπρὸν [from διάσπαω, I separate], meaning "patterned," figured, diapered. Arras is from Arras; Cordwain from Cordova; and Nankeen from Nankin. Gauze is said to be from Gaza, Baize from Baiæ, and Dimity from Damietta. Cypresse is from Cyprus; and Frieze from Friesland; Jean from Jaen; Cloth of Rayne from Rennes; and Cloth of Tars from Tarsus, or perhaps Tabriz. Drugget is said to be from Drogheda; Duck, that is Tuck [whence Tucker Street, Bristol], from Torques in Normandy. Bourde de Elisandre or Bourdalisandre from Alexandria; Worsted from Worsted in Norfolk; and Kerseymere ("Cashmere") from Kersey, and Linsey-Wolsey from Linsey, two villages of Sussex. Gingham is said to be from Guingamp; Siclatoun is thought to be from Sicily. Chintz is derived from *chint* or *chete*, Hindu words for variegated, spotted, whence *cheta;* but I believe it to be derived from China, and that the weavers of Masulipatam first learned to stamp Chintz with its peculiar patterns from the silks landed at that port from China. Velvet and Samit are both fabrics of Eastern origin, and the etymology of the former word, in old English "velouette," is from the Italian *vellute*, fleecy, nappy, and Latin *vellus* a fleece; and of the latter, from ἑξ "six," and μίτοι "threads," the number of threads in the warp of the texture. Camlet was originally probably woven of camels' hair. Under the Eastern Empire *Chrysoclavus* was the name given to old silks of rich dyes worked with the round nail head pattern in gold. The name *Gammodion* was given to silks patterned with

the Greek letter Γ; and when four of these letters were so placed as to form a St. George's cross, or a *Filfot* cross, the silk was termed *Stauron*, or *Stauracinus*, and *Polystauron*. *De fundato* were silks covered with a netted pattern in gold; and *Stragulatæ* were striped or barred silks, evidently derived originally from India. Tissue is cloth of gold or silver similar to Siclatoun, Tartarium or *Naques*, and the *soneri* and *ruperi* of India; and the flimsey, bluish paper called tissue-paper was originally made to place between the Tissue to prevent its fraying or tarnishing when folded up. Cloth of Pall would be any brocade used as an ensign, robe, or covering-pall of State, and generally means Baudekin. *Camoca* is the same word as *kincob* (*kimkhwa*). Shawl is the Sanscrit, *sala*, a floor, or room, because shawls were first used as carpets, hangings and coverlets. The word therefore is in its origin the same as the French *salle* and Italian *salone*, saloon, or large room. We must wait for Colonel Yule to give us the etymology of *Bandana* pocket handkerchiefs.

Cottons.

The cotton manufactures did not obtain a real footing in Europe until last century. At a date before history the art was carried from India to Assyria and Egypt; but the plant was not introduced into Southern Europe until the 13th century, where its wool was at first used to make paper. The manufacture of it into cloth in imitation of the fabrics of Egypt and India was first attempted by the Italian States in the 13th century; from which it was carried into the Low Countries, and thence passed over to England in the 17th century. In 1641 "Manchester cottons," made up in imitation of Indian cottons, were still made of wool. But in vain did Manchester attempt to compete on fair free trade principles with the printed calicoes of India, and gradually Indian chintzes became so generally worn in England, to the detriment of the woollen and flaxen manufactures of the country, as to excite popular feeling against them; and the Government, yielding to the clamour, passed the law, in 1721, which disgraced the statute book for a generation, prohibiting the wear of all printed calicoes whatever. It was modified in 1736 so far that calicoes were allowed to be worn, "provided the warp thereof was entirely of linen yarn." Previously to this, in 1700 a law had been passed by which all wrought silks, mixed stuffs, and figured calicoes, the "the manufacture of Persia, China, or the East Indies, were forbidden to be worn or otherwise used in Great Britain." It was particularly designed for the protection of the Spitalfields silk manufacture, but proved of little or no avail against the prodigious importation and tempting cheapness of Indian piece-goods at that time. Cotton was first manufactured in Scotland in 1676, and in Glasgow in 1738, and in Manchester the manufacture of printed calicoes was regularly established in 1764. Fustians dimities and vermilions from cotton-wool had, however, been made in London and in Manchester from 1641. After the invention of Arkwright's machine, in 1769, the production of Manchester

developed so rapidly as to make it very evident that the protection of manufactures against foreign competition was a violation of the first principles of political economy.

We have seen that cotton is mentioned in the Bible (Esther i. 6) by its Sanscrit name, and "the white and blue cotton hangings" described were probably imitations from, if not actually, Bengal *satrangis*. The Ramayana frequently mentions colored garments, and the way in which robes are represented colored on the Egyptian monuments in zig-zag stripes of different colours, green, yellow, blue, pink, is one of the most characteristic ways of dyeing cotton cloth in India. Herodotus, Book i. ch. 203, tells of a certain tribe of the Caspian: "In these forests certain trees are "said to grow, from the leaves of which, pounded and mixed "with water, the inhabitants make a dye, wherewith they paint "upon their clothes the figures of animals, and the figures so im-"pressed never wash out, but last as though they had been in-"woven in the cloth from the first, and wear as long as the "garment." Pliny, Book xxxv. ch. 42 (11), writes: "In Egypt "they employ a very remarkable process for the colouring of "tissues. After pressing the material, which is white at first, "they saturate it, not with colours, but with mordants that are "calculated to absorb colour. This done, the tissues, still un-"changed in appearance, are plunged into a cauldron of boiling "dye, and are removed the next morning fully coloured. It is a "singular fact, too, that, although the dye in the pan is of an "uniform colour, the material when taken out of it is of various "colours, according to the nature of the mordants that have been "respectively applied to it; these colours, too, will never wash "out."

From Arrian we have seen that Σινδόνες, muslins; and Ὀθόνια, cottons; Περιζώματα, sashes, Ζῶναι σκιωταί, sashes striped with different colours; Πορφύραι, purple cloth; and Σινδόνες μολόχιναι, muslins of the colour of mallows, were exported in his time from India to all the ports on the Arabian and East African coasts. The Portuguese gave the name of *Pintadoes* to the chintzes of India when they first saw them at Calicut. Indeed the cotton tissues and stuffs of India have always been even more sought after for the beauty and brilliance of their natural dyes, than for the fineness and softness with which they are woven; and one of the greatest improvements in English textile manufactures would be the substitution of the rich deep-toned Indian dyes for the harsh flaring chemicals, especially of the Magenta series, at present in use. Mr. Wardle, of Leek, has paid great attention to this matter, especially in connexion with the application of dyes to the *tusser* silk of India.

The Maharajah of Cashmere has, it is said, adopted an effectual plan for the suppression of the Magenta dyes within his kingdom. First, a duty of 45 per cent. is levied on them at the frontier; and at a certain distance within the frontier, they are confiscated and at once destroyed.

The great export cotton manufactures of India have long fallen before the competition of Manchester. Still, however, an immense

cotton manufacture, for domestic purposes, continues to exist in India, equal probably to the whole export trade of Manchester; and now that cotton mills are being established in Bombay and other cities, we may expect to see the tide of competition at last turned against Manchester. In consequence also of the improvement of national taste in this country, and the spread of higher education and culture among the natives of India, we may hope for a rapid increase in the demand for Indian hand-loom made and artistically dyed and printed piece goods. The true *couleur d'ivoire* is only found naturally in Indian cotton stuffs. Nothing could be more distinguished for the ball-room, nothing simpler for a cottage, than these cloths of unbleached cotton, with their exquisitely ornamented narrow borders in red, blue, or green silk. Native gentlemen and ladies should make it a point of culture never to wear any clothing or ornaments but of native manufacture and strictly native design, constantly purified by comparison with the best examples and the models furnished by the sculptures of Amravati, Sanchi, and Bharhut.

Surat is a town which suffered as much as any in India from the extinction of the East India Company's trading monopoly in 1833. "A new era was opened to English commerce," writes the historian, heedless of the two centuries of manufacturing activity and prosperity, under the Company's fostering rule, which had preceded it in India. But within the last four or five years the cotton manufactures of Surat have begun to revive, and the Khatris or Hindu weavers have begun to make cloth of a new pattern, chiefly for bodices, which is largely exported to the Deccan.

Baroach, also, under the East India Company, was a great centre of cotton manufactures, from the stoutest canvas to the finest muslins; but the industry was ruined by the unrestrained Manchester imports, and of the 30 odd varieties of cloths enumerated in the factory diary for 1777, now only six are made.

At Vizagapatam a strong cloth is made called *punjam*, that is, "120 threads," and the cloth is denominated 10, 12, 14, up to 40 *punjam*, according to the number of times 120 is contained in the total number of threads in the warp. Dyed blue at Madras, it is exported to Brazil, the Mediterranean, and to London for the West Indies. Imitation Scotch checks and plaids are also made for the large population of poor native Christians in the Madras Presidency.

In the Godavery district most excellent cloths are made at Uppada near Coconada, and in the villages about Utapalli and Nursapore, and the fine turbands made at Uppada are still in great requisition. Tent cloth of superior quality is also manufactured in the villages near Rajamundri, and in the Central Jail. The weavers are however in a very impoverished condition, as their industry has languished and gradually declined ever since the abolition of the exclusive trade of the East India Company.

Formerly there was a large manufacture of blue *salampores* at Nellore, which was quite broken up by the West Indian Emancipation Act, for the freed negroes refused very naturally to wear the

garb of their slavery; and the heavy expenses of land carriage, the absence of railways and canals, and the risks of sending goods down to Madras by sea in native craft uninsured, while no insurance office will accept the risk, all operate against the revival of the old trade, and the development of the immense natural resources of Nellore as a manufacturing centre.

The weavers and dyers of Bangalore who formerly worked for the Court of Seringapatam still manufacture the printed cotton cloths which were always their speciality. They are very coarse and printed in only two colours, red and black, with mythological subjects taken from the Ramayana and Mahabharata. They are made chiefly for the service of the temples, and are very rare to get, except by favour from the priests. Sometimes they are touched up in yellow by hand painting.

At Hoshungabad, in the Central Provinces, the weaving trade flourished until the enormous demand for cotton wool in 1863–64 raised the price of the raw material beyond the weavers' means. All the cotton wool in the district was exported, and Manchester piece goods at once imported, and they have held the market ever since. Many native looms have in consequence stopped, and the local manufacture has partially succumbed.

At Chanda, coarse and fine cloths are made which are still exported to all parts of Western India, and which formerly found their way to Arabia. The Telinga weavers turn out cloths of colored patterns in very good taste, and cotton thread of wonderful fineness is spun for export to other parts of India.

Before the annexation of the province a large number of the lower classes of Oudh were employed in weaving cotton, and their looms paid a fixed annual duty to the King, but the industry received a fatal blow directly it was exposed to the unrestricted competition of Manchester, if indeed it has not been utterly annihilated. Cotton printing, however, still continues to be a successful business at Lucknow, although Manchester chintzes sell for a shilling the yard, while those printed on the spot cost twenty pence a yard. But the Lucknow chintzes are far superior in colour, the Kukrail and Baita rivers being famous for the purity of the tints their waters give to the deep-toned dye stuffs of India.

At Dacca, in the time of Jehangir, muslin could be manufactured three yards long and one broad, weighing only 900 grains, the price of which was 40*l*. Now the finest of the above size weighs 1,600 grains and is worth only 10*l*., and even such pieces are made only to order. Tavernier states that the Ambassador of Shah Safy [A.D. 1628–1641], on his return from India, presented his master with a cocoanut, set with jewels, containing a muslin turband thirty yards in length, so exquisitely fine that it could scarcely be felt by the touch. A rare muslin was formerly produced in Dacca, which laid on the grass, and wetted by the dew, became invisible. The demand for the flowered muslins of Dacca has entirely fallen off, but there is a brisk and increasing demand for *Tusser* embroidered muslins throughout India, and for Persia, Arabia, Egypt, and Turkey.

The cotton manufacture at Santipur arose from its having been the centre of the large factories established in the Nadiya districts in the old days of the East India Company.

At Noakhali, also formerly under the East India Company, cotton cloths were largely manufactured, but the trade died out at once with the extinction of the Company as a trading power. At Sarail, in Tipperah, *tanjib* muslin is made as fine almost as the finest of Dacca; and the East India Company had a factory at Charpata, where a species of *bafta* or Basta, as it was called in the European trade, was made, which gained a great reputation; but the factory was closed about 50 years ago. At Kasimbazaar, also, there was a great decline in its once famous manufactures after 1833. Undoubtedly, the period of the East India Company's sovereignty and monopoly, from 1757 to 1833, was the happiest India ever enjoyed since the time of the supremacy of Buddhism under the Maurya dynasty.

The following alphabetical list of the leading denomination of the fabrics manufactured in India for the East India Company has been compiled from the books in the Record Department of the India Office, of the Company's sales and accounts from 1671 to 1731, and from the Act of Parliament directed against the importation of such articles in England and their use in this country. The names of such as are not cotton piece goods are printed in italics. As the list is of some historical interest, the names are given with all the variations of spelling found in the Company's books.

Abdaties, addaties, addethas;
Adreas, ardeas;
Allachas;
Alliballies;
Allebanes, allibanies;
Allejars;
Amadavad Taffeties;
Amorees;
Anquans (?);
Aprons;
Arrahs;
Atcharbannies;
Atlases (satin); *atlas catanees*;
Aubrahs, awbroahs.

Bafts, baftas, baftaes, Bafts Bajetar, and many other denominations of Bafts;
Ballybands, — query Bellybands;
Bandannoes;
Bettellas, beteeles, betelees, and of many varieties, such as Golconda, Original, and Podavetz;
Birampautts, birampouts, byrampautte;
Birds eyes;
Blue cloth;
Brawles;
Broderas.

Callicoes;
Callipatties;
Callowgee Poisé, callawaypoose;
Cambays;
Cambrics;
Carmania shells (shawls ? — *shal-i-Kermam;*
Carpets;
Carpets of wool;
Carpets of silver and gold;
Carridarries, choradarrees:
Chacklaes, chucklaes, chillaes;
Chandennies;
Charconees, charconnaes;
Chabannies;
Chawools (shawls ?);
Chennachurrees;
Chunderbannies;

Checquered Silks;
Chinchuras;
Chintz, Serungee or serwungee, Candy, Caline (Calian?), Golconda, Surratt, Patna;
Choradarrees;
Choucareas;
Chowlerrees;
Chowtars;
Chundracounaes;
Chustaes;
Comees;
Comervillies, comervilles;
Congees;
Coopers;
Corahs;
Cossaes, cossas;
Cotton Romalls;
Cudphoolees;
Culgees;
Cumsalees;
Cuttanees.

Damasks; Damask Hannoes;
Dareas;
Decca musters, (muslins?);
Derribafts;
Deries;
Derribands; derribannees;
Diapers;
Dimities;
Doduns;
Doosooties;
Dooties, Ducka Dutties;
Dungarees;
Dysuksoys;

Ecbarries; eckbarres;
Elatchees;
Emarties, emertys, emmerties;
Errendy cloth, (wild silk);
Ferridines (a spelling presumably of Terridines).

Gagaroons;
Gawze, and *Gold Gawze;*
Geelongs;
Ginghams;
Goa Concheralaes;
Golpumbas;
Goshews;
Gothan Cherulaes;
Guinea stuffs, evidently same entry as Gunny Stuffs, Gunnys, and Guynies;
Gurbannies;
Gurrhaes, gurrahs.

Habbassies;
Handkerchiefs;
Hannoes (see Damasks);
Hempen Canvas;
Herba Linga;
Herba Taffetas;
Humhums, humhums quilted.

Jamdanees, jamdannies, jandammes;
Jamwars, jarnavars;
Jappan gowns;
Jecolsies, jellosies;
Junnaes, junaes, junays;
Junnapores.

Kerribands (possibly a misspelling for Derribands);
Kelongs, painted;
Kincha;
Kissorisoys.

Lawns;
Longis, lungees, lunzaes;
Longcloth, and Blue Longcloth;
Laccowries, luckhowries, luckhowry, luckhouries.

Mamoodees, mamodies, mammodies;
Mammoodiatties, mamolcohiates, mamudpiattees;
Meroos;
Meercooles, meerculees;
Mobutbannees;
Mocha Stuffs;
Moopees;
Mooreees;
Muggadooties;
Mullmulls, Mulmuls (muslins);
Mundells;
Mushrues;
Musters.

Naibabbies (nabobs?);
Nagenas;

Nainsooks;
Necannees, nicanees;
Neckcloths;
Nehallawars;
Nightrails, flowered;
Nillaes, nittees (evidently a misspelling);
Ningyauns.

Ojamas.

Pantkaes;
Pallampores, palumpores;
Paunchees, paunches;
Peniascoes, pemascoes;
Percallaes, percaulahs, parcolles;
Petticoats;
Photeas;
Picotenios;
Poises;
Polongs;
Pomphanes;
Punia silks;
Pulicat Handkerchiefs;
Putcahs.

Quilts, small Pintadoe Quilts.

Razees, raraes;
Reckings;
Romalls, romals;
Rowallews;
Rungs, rungoes, rings, rehings.

Sacerguntees;
Sailcloths;
Sallempores, sallampores, salampores;
Salloes, sallees, saloos;
Sannoes;
Sattins;
Seerbands, seerbunds, serrebands;
Seerbetties;
Seerbandconnaes;
Shalbafts;
Sheerbafts [*see* Zeerbafts];
Sideruncheras, salderuncheras;
Silk congees;
Soosies, sooseys;
Sovaguzees, souagwzees;
Subnoms, sufloms;
Succatums;
Syndacloth, Sinda cloth.

Taffaties, *T. herba;*
Tanna stuffs [1682];
Tainsooks [*see* Nainsooks];
Tanjebs, tanjeebs;
Teepoys;
Terriduns, terridams terindames [*see* Ferridines];
Tartoories;
Topsails.

Vermillions [1704];
Velvetts.

Zarees [saris ?];
Zeerbafts [*see* Sheerbafts].

Dr. Forbes Watson, the Director of the India Museum, in his exhaustive work on "The Textile Manufactures and the Costumes of the People of India," which embodies the results of the research of a lifetime, and is worthy of the time and labour given to its preparation, classes together the manufactures in cotton, silk, and wool which are made up on the loom as garments, such as turband cloths, and the *dhoti*, a flowing cloth bound generally round the loins. It is generally bordered with purple or red, blue or green, like the *toga prætexta* [limbo purpureo circumdata], and in Mysore the *dhoti* is called *togataru*. The *sari*, used by the women, is also loom-made, and is the undoubted κάλυμμα of Homer. Thus Thetis [Il. xxiv. 93, 94]

"Veiled her head in sable shade,
Which flowing long her graceful person clad."

Kerchiefs, and waist cloths, and sashes are also loom-made. The principal garments made up by cutting and sewing are the

bodice [*choli*] for women, who sometimes also wear a petticoat; and drawers [*pijama*, literally "leg-cloth" from Sanscrit *pada*, Hindi *pai*, foot, so books say; but possibly from the Sanscrit word identical with the Greek πύγη, *e.g.*, in Venus Kallipygos], worn both by men and women; and the undress coat, *angarka*; and full dress coat, *jama*, worn only by men; and caps which go by all sorts of names, such as *topi*, *taj*, and others.

Among piece goods the first place is given to Dacca Muslins, *abrawan*, or "running water;" *bafthowa*, "woven air;" *shubanam*, "evening dew," all plain white webs, the poetic names of which convey to the reader a truer idea of their exquisite fineness and delicacy, and of the estimation in which they are held, than whole pages of literal description. These fine Muslins are all classed under the generic term of *mulmul khas* or "King's Muslins." Plain muslins are made not only at Dacca and Patna and other places in Bengal, but also at Hyderabad in the Deccan, and at Cuddapah and Arni in Madras. Striped Muslins or *duria* are made at Dacca, Gwalior, Nagpore, Hyderabad, Arni, and other places. Checquered Muslins, or *charkana*, are chiefly made at Dacca, Nagpore, Arni, and Nellore; and Figured Muslins, *jamdani*, at Dacca. Dr. Forbes Watson describes them as the *chef d'œuvre* of the Indian weaver. At Calcutta embroidered muslin is called *chikan* ["needle" work]. Muslins woven with colored thread, striped, and checked, and figured, are made at Benares, Arni, Nellore, and Chicacole in Madras; printed Muslins at Trichinopoly, and gold and silver printed Muslins at Jeypore, and Hyderabad in the Deccan. "The process," Dr. Forbes Watson writes, "by which this mode of decoration is accomplished is by "stamping the desired pattern on cloth with glue; the gold or "silver leaf as the case may be, is then laid on, and adheres to "the glue. When dry what has not rested on the glue is rubbed "off." In Persia the gold was sprinkled in the form of dust on the pattern previously prepared with size. Messrs. Vincent Robinson & Co. exhibit a very rare example of one of these old Ispahan chintzes, wood block printed in gold and colours on a black ground.

The Calicoes Dr. Forbes Watson classifies as plain, bleached and unbleached, made all over India: Calicoes woven with colored thread, comprising; first, *susis* and *khesis*, striped cloths of brilliant hue, made largely in the Punjab and Scinde, and also at Surat, Palamcottah, Cuddalore, and other places in Madras, and used chiefly for trouserings; second, also striped, manufactured in Nepal and Pegu, and used for skirts; and third, Checks and Tartans, used also for skirts and petticoats, and manufactured at Ludianah, Broach, Tanjore, Cuddalore, Masulipatam, and other places in Madras: and Printed Calicoes [Chintzes, Pintadoes], first on a white ground, manufactured at Fatehgarh, Masulipatam, and Arcot, &c.; second, printed on a colored ground, manufactured at Shikarpur, Agra, Fatehgarh, Bijapore, Bellary, Arcot, and Ponneri, in Madras; and third, the celebrated *palampores*, or "bed covers," of Masulipatam, Fatehgarh, Shikarpur, Hazarah, and other places, which in point of art decoration are

simply incomparable. As art works they are to be classed with the finest Indian pottery and grandest carpets. Lastly, Dr. Forbes Watson classes together the miscellaneous cotton fabrics chiefly made for Anglo-Indian use; the pocket handkerchiefs of Nellore; the damask and diaper table cloths, napkins, and towels of Madras, Salem, Masulipatam, Cuddalore, and Baroach; and the counterpanes and quilts of Karnul, Hyderabad in the Deccan, and Ludianah.

Lace work has only recently been introduced into India, but the natives shew a singular aptitude for it, and the excellent samples of it in cotton, silk, and gold and silver among the Prince of Wales presents from Tinnevelly and Nagarcoil in Madras leave nothing to be desired either in design or manipulation. A white lace called *gota*, and a colored variety called *pattias* are made in the Punjab.

Gold and silver lace, of a totally different character, and of the sort used in England by military tailors, is made in several of the old royal cities of India, and in large quantity at Lucknow, particularly in the variety called *lachka*. The warp is of silver gilt strips, woven with a woof of silk. It is often stamped with patterns in high relief, and is much and widely used for edging turbands and petticoats. In the variety known as *kulabatu*, strips of gilded silver are twisted spirally round threads of yellow silk, and then woven into a tape or riband exactly resembling *lachka* in appearance. In another variety of gold lace the woof is of wire and the warp of silk. The strips of silver gilt used in making *kulabatu* and *lachka* lace are prepared by beating silver gilt wire flat, and the natives of India are far superior to the English in the art of wire drawing.

Silks.

As silk is woven with the striped cotton *susis* of the Punjab and Scinde, so we find cotton mixed with silk in the silken piece goods known in India under such names as *mashru* and *sufi*, meaning "permitted." It is not lawful for Mussulmans to wear pure silk [*holosericum*], but silk mixed with cotton they are permitted to wear; and hence the well known Indian fabrics with a cotton warp or back, and woof of soft silk in a striped pattern, having the lustre of Satin, or *atlas*, are called *mashru*. *Sufi* is the name given to the striped [*gulbadan*] "permitted" silks, called also *shuja-khani*, of Bhawalpur, which differ from *mashru* in that they have no satiny lustre, and look like a glazed calico. They can scarcely be distinguished from *susis*, and are glazed with a mucilaginous emulsion of Quinceseed. These mixed stuffs are also found plain and checked and figured, and are largely made in the Punjab and Scinde, at Agra, and Hyderabad in the Deccan, and at Tanjore and Trichinopoly. Pure silk fabrics, striped, checked, and figured, are chiefly made at Lahore, Agra, Benares, Hyderabad in the Deccan, and Tanjore. The printed silks worn by the Parsi and Bhatia and Bunia women of Bombay are a speciality of Surat. Wild silk [*tusser*, *eria*, and *munga*]

is woven chiefly in Cachar, and at Darjiling, Bhagalpur, and Warangal. Gold and silver are worked into the decoration of all the more costly loom-made garments and Indian piece goods either on the borders only, or in stripes throughout, or in diapered figures. The gold bordered loom embroideries are made chiefly at Sattara, and the gold or silver striped at Tanjore; the gold figured *mashrus* at Tanjore, Trichinopoly, and Hyderabad in the Deccan; and the highly ornamented, gold figured silks, and gold and silver tissues principally at Ahmedabad, Benares, Murshedabad, and Trichinopoly. Dr. Forbes Watson restricts the term Tissues to Cloths of Gold and Silver, *ruperi* and *soneri*, made of flattened strips of gold. The native word *kincob* is also generally restricted to the highly ornamented gold (or silver) wrought silk brocades of Murshedabad, Benares, Ahmedabad and other places; but, as these *kincobs* in their style and essential character are older than the use of silk in India, Babylonia, Phœnicia, and Egypt, the name is confusing when used in connexion with the history of decorative art, unless understood in a sense coextensive with brocade. The description which Homer gives of the robe of Ulysses in the xixth Book of the Odyssey accurately describes a Benares *shikargah*, or happy "hunting ground" *kincob*.

"In ample mode
A robe of military purple flow'd
O'er all his frame; illustrious on his breast
The double-clasping gold the King confest.
In the rich woof a hound, Mosaic drawn,
Bore on full stretch, and seized a dappled fawn;
Deep in his neck his fangs indent their hold;
They pant and struggle in the moving gold.
Fine as a filmy web beneath it shone
A vest, that dazzled like a cloudless sun.
The female train who round him throng'd to gaze,
In silent wonder, sigh'd unwilling praise.
A sabre when the warrior pressed to part,
I gave enamelled with Vulcanian art;
A mantle purple tinged, and radiant vest,
Dimension'd equal to his size, express'd
Affection grateful to my honour'd guest."

And, when this passage is read with others in Homer, proof is added to proof of the traditional descent of the *kincobs* of Benares, through the looms of Babylon and Tyre and Alexandria, from designs and technical methods which probably, in prehistoric times, originated in India itself, and were known by the Hindus already in the times of the Code of Menu, and before the date of the Ramayana and Mahabharata.

Thus in Iliad iii.:

"Meantime to beauteous Helen from the skies,
The various goddess of the rainbow flies.
Here in the palace at her loom she found,
The golden web her own sad story crown'd;
The Trojan wars she weav'd, herself the prize,
And the dire triumph of her fatal eyes."

And Iliad v.:

"Pallas disrobes; her radiant veil unty'd,
With flowers adorn'd, with art diversify'd."

And Iliad vi.:

"The largest mantle her rich wardrobes hold,
Most prized for art, and labour'd o'er with gold.'
* * * * * *
"The Phrygian Queen to her rich wardrobe went,
Where treasured odours breathed a costly scent.
There lay the vestures of no vulgar art,
Sidonian maids embroider'd every part,
Whom from soft Sidon youthful Paris bore,
With Helen touching on the Tyrian shore.
Here as the Queen revolv'd with careful eyes,
The various textures and the various dyes,
She chose a veil that shone superior far,
And glow'd refulgent as the morning star."

And in Od. xv.:

"Meantime the King, his son, and Helen, went
Where the rich wardrobe breathed a costly scent,
The King selected from the glittering rows,
A bowl; the Prince a silver beaker chose.
The beauteous Queen revolv'd with careful eyes
Her various textures of unnumber'd dyes,
And chose the largest; with no vulgar art,
Her own fair hands embroider'd every part.
Beneath the rest it lay divinely bright,
Like radiant Hesper o'er the gems of night."

The two last passages are photographic vignettes from any wealthy Indian Settia's house, and in copying them one seems to breathe again the very odours of the costus and costly spikenard which native gentlemen wrap up with their rich apparel, and fine muslins and broidered work.

There is an Indian brocade called *chand-tara*, "moon and stars," because figured all over with representations of the heavenly bodies; Athenæus, A.D. 230, quotes from Duris [B.C. 285–247], the description of a cloak worn by Demetrius [B.C. 330], into which a representation of the heavens, with the stars and 12 signs of the Zodiac, was woven in gold; and Josephus [A.D. 37–100] states ["Wars of the Jews," Bk. v., ch. v. 4] that the veil presented to the Temple by Herod, "was a Babylonian curtain, embroidered "with blue and fine linen, and scarlet and purple, and of a contex-"ture that was truly marvellous. Nor was the mixture of colours "without its mystical interpretation, but a kind of image of the "universe. * * * This curtain had also embroidered upon it "all that was mystical in the heavens, excepting that of the 12 "signs of the Zodiac, in the likeness of living creatures." In 2 Chronicles iii. 14, we read: "And he (Solomon) made the veil "of blue and purple and crimson and fine linen, and wrought cheru-"bims thereon." The veil of the Holy of Holies, made by Moses, Josephus ["Antiquities," Bk. iii. ch. vi. 4] states, "was very "ornamental, and embroidered with all sorts of flowers which the "earth produces, and there were interwoven into it all sorts of "variety that might be an ornament, excepting the forms of

"animals." The passages in which various classical writers describe curtains and carpets, and broidered work figured with animals and men, "Persians," "portraits of Kings," and "Parthian letters," are too numerous for quotation. It is an interesting fact that at Rai Bareli and other places in Oudh, a peculiar brocade is made inwoven in gold and coloured silks with passages from the Vedas, the Koran, and Watts's Hymns.

Beside *chand-tara*, among other poetical names for Indian patterns of silks and *kincobs*, may be mentioned *mazchhar*, "ripples of silver"; *halimtarakshi*, "pigeon's eyes"; *bulbulchasm*, "nightingale's eyes"; and *murgala*, "peacocks necks." The manufacture of colored silks was, of course, originally introduced into India from China, but at what period it is almost impossible to say. They are mentioned, as we have seen, in the Ramayana, but whether of Chinese manufacture or Indian cannot now be determined. In the Bible the first undoubted notice of silk is in Revelations xviii. 12. The Hebrew terms which are supposed to refer to silk are *meshi* and *demeshek*. The former, in Ezek. xvi. 10, 13, is translated by "silk," and the latter, in Amos iii. 12, by Damascus:—"Thus saith the Lord, as the shepherd taketh out of "the mouth of the lion two legs or a piece of an ear, so shall the "children of Israel be taken out that dwell in Samaria in the "corner of a bed, and in Damascus in a couch." It has been thought that in this verse *demeshk* should be translated by silk. The *shesh* [probably the same word as *demshek*] of Genesis xli. 42, of many chapters in Exodus, and of Ezekiel xxvii. 7, is in all these places uniformly translated in the authorized English version of the Bible by "fine linen" and "linen," that is, of Egypt. But in Genesis xli. 42, the margin gives "silk," and *shesh* is translated by "silk" in Proverbs xxxi. 22. Elsewhere the Hebrew words which have been translated by "linen" and "fine linen" are *bad*, in Exodus xxviii. 42, xxxix, 28, Leviticus vi. 10, and xvi. 4, 23, 32, 1 Samuel ii. 18, and xxii. 18, 2 Samuel vi. 14, 1 Chronicles xv. 27, Ezekiel ix. 2, 3, 11, and x. 2, 6, 7, and Daniel x. 5, and xii. 7; *butz* [βύσσος], 1 Chron. iv. 21, xv. 27, 2 Chron. ii. 14, iii. 14, and v. 12, Esther i. 6, and viii. 15, and Ezekiel xxvii. 15; *sadin*, Judges xiv. 12, 13; *etun*, Proverbs vii. 16, a word which, if it is identical with the Greek ὀθόνη and ὀθόνιον, would mean not linen but cotton; and *pishtah*, Leviticus xiii. 47, 48, 52, 59, Deutronomy xxii. 11, and Jeremiah xiii. 1, translated "flax" in Exodus ix. 31, Judges xv. 14, Proverbs xxxi. 13, Isaiah xix, 9, and xlii. 3, and Hosea ii. 5; and "tow" in Isaiah xliii. 17, *pistah* in fact denoting in Hebrew not only linen stuffs, but flax, and the flax plant. Richstofen believes the *shcrikoth* of Isaiah xix. 9, to be silk. It is difficult to believe that the Egyptians did not weave raw silk, as we know that they possessed the art of reducing Chinese silks to a sort of muslin-like web,

"A wondrous work, of thin transparent lawn,"

as Lucan describes it [Bk. x.] in the account he gives of Cleopatra's feast to Cæsar; and it is quite possible that "the fine linen of Egypt," and "the fine linen of Colchis," which was sent

to Sardis to be dyed [Herodotus ii. 105], may have included silk. It was not, however, until the time of Julius Cæsar [B.C. 47] that Chinese silks began to be largely introduced into Southern Europe, and Virgil is the first classical writer who is supposed to allude unequivocally to it, in the second Georgics:

> "Black ebon only will in India grow,
> And odorous frankincense on the Sabæan bough.
> Balm slowly trickles through the bleeding veins
> Of happy shrubs in Idumæan plains.
> The green Egyptian thorn, for medicine good,
> With Ethiop's hoary trees, and woolly wood,
> Let others tell: and how the *Seres* spin
> Their fleecy forests in a slender twine."

Aristotle certainly knew the silk worm, βόμβυξ, and its cocoon, βομβύκιον, [Hist. An: v. 19 (17), 11 (6)]. He describes it as, "A "certain great worm, which has as it were horns, and differs from "others, at its first metamorphosis produces a caterpillar, [κάμπη] "afterwards a bombylius [βομβυλιός] and lastly a necydalus "[νεκύδαλος]. It passes through all these forms in six months. "From this animal some women unroll and separate the cocoons, "and afterwards weave them. It is said that this was first woven "in the island of Cos by Pamphile, daughter of Plates, πρώτη δὲ "λέγεται ὑφῆναι ἐν Κῷ Παμφίλη Πλατέω θυγάτηρ." Pliny [Bk. xi. 26 (22)] 400 years later, following Aristotle's description, also says that Pamphile was the first who discovered the art of unravelling the silk worms webs, and spinning tissue therefrom:—"Prima eas "redordiri, rursusque texere, invenit in Ceo mulier Pamphila Latoi "filia, non fraudanda gloria excogitatæ rationis ut denudet feminas "vestis." This was indeed the well known "Coa puellis vestis," which was so transparent that the form and colour of the body could be seen through it, as represented in the well-known *al fresco* painting at Pompeii of a dancing girl, whose Coan vesture floats round her like a summer mist, disclosing the whole contour of her figure, and the perfect grace of her action, as through a veil of silken gauze.

> "As if unclothed she stands confest,
> In a translucent Coan vest."

In chapter 27 (23) of the same book Pliny describes the reeling of Coan silk, and mentions that men have not felt, ashamed to make use of garments made of it in consequence of their extreme lightness in summer; adding, "the produce of the Assyrian silk "worm we have left till now to the women only." But in Book vi. 20 (17) all he has to say about Chinese silk is that "the Seres "are famous for the wool that is found in their forests, and after "steeping it in water they comb off a white down that adheres "to the leaves," "and then to the females of our part of the world "they give the two fold task of unravelling their textures, and of "weaving the threads afresh." This, however, is no more than Lucan's "Sidonian fabric which wrought in close texture by the "sley of the Seres, the needle of the workman of the Nile has "separated," in which he represents Cleopatra to have appeared in the full splendour of her charms, when she feasted Cæsar in

high Alexandrian fashion. And even Dionysius Perigetes, so late as A.D. 275–325 would still seem to have had no better information regarding the natural source and the manufacture of Chinese silks than Virgil's poetical allusion. What he says is: "The Seres "comb the variously coloured flowers of the land to make their "precious garments, rivalling in colour the flowers of the meadow "and in fineness the spider's web." Aristotle does not say that the silkworm was reared, and raw silk produced in Cos; he simply describes the silk worm, and says that silk was first woven in the island of Cos by Pamphile, the daughter of Plates. Pliny would seem to have confused the manufacture of silk from cocoons with the unravelling of Chinese silks and weaving their threads again into Coan gauze; and perhaps with that of the silky stuff made from the floss-like beard of the *Pinna marina*, and still manufactured at Taranto, which was held in the highest estimation by the Greeks and Romans. Or raw silk, Indian, if not Chinese, may have possibly been known, and woven to some extent in Western Asia, Egypt, and the island of Cos, for generations before Chinese silken stuffs were brought to the west. Then Pliny's only error would be in jumping to the conclusion, from Aristotle's simple statement about Pamphile, that the silk-worm moth was bred in Cos. Be this as it may, it is clear that the silk-worm and its cocoon were known to the Greeks and the Romans from the time of Alexander's expedition to India, and equally clear that Chinese silk stuffs were not generally known in Southern Europe before the time of Julius Cæsar, who first displayed a profusion of them in some of those magnificent theatrical spectacles with which he was wont to entertain the populace of Rome. It was at first used only by a few women of the highest and most opulent families. In the reign of Tiberius Cæsar a law was passed that no man should disgrace himself by wearing silk "ne vestis serica viros fœdaret." It was priced at its weight in gold, as shewn by the anecdote told of Valerian, A.D. 253–260: — "Vestem holosericam neque ipse "in vestiario suo habuit, neque alteri utendam dedit. Et quum "ab eo uxor sua peteret, ut unico pallio blatteo serico uteretur, "ille respondit, *absit ut auro fila pensentur*: libra enim auri libra "serici fuit." And from the Rhodian naval regulations (*Lex Rhodia*) which are preserved, at least the clauses *de jactu*, in the Digests of the Roman laws, published A.D. 553, we find that unmixed silk goods [*holosericum*], if they were saved free from wet, were to pay a salvage of ten per cent. as being equal in value to gold.

But the demand for silken articles rapidly increased in spite of all prohibitions and restraints, and their enormous price, and so great was the drain of specie from the Eastern Empire on account of silk and other Eastern productions, that the Emperor Justinian resolved to introduce the cultivation of silkworms into Europe; and, encouraged by his promises and gifts, two Persian monks succeeded, about A.D. 550, in carrying the eggs of these insects to Constantinople. The Issidones, the inhabitants of the modern Khotan, had from the earliest ages been the chief agents in the transmission of silk from China over the Himalayas into

India, and across the Pamere Steppe into Western Asia and Europe. Direct traffic between China and Turkestan only began about B.C. 114, and ended A.D. 120, when the overland trade in silk fell into the hands of the Persians. At first Justinian endeavoured by means of the Christian Prince of Abyssinia to wrest a portion of the trade from the Persians; but, failing in this attempt, he succeeded in obtaining his object at last by a mere accident. The two Persian monks, who had learned among the Seres the whole process of the culture of silk worms and manufacture of silk, imparted their secret to the Emperor: and, being induced to return to China, succeeded in safely bringing back with them to Constaninople a quantity of eggs concealed in the hollow joint of a bamboo. The Greeks soon acquired great skill in the production of the raw silk, and carried on its manufacture at Thebes, Corinth, and Argos, and other places in the Peloponnesus, undoubtedly deriving their designs from the cotton and linen, if not silk looms of Al Modayn, Alexandria, Tabriz, Damascus, Tyre, Berytus and Antioch. Procopius indeed says that long before his time silk had been made at Tyre and Berytus. The manufacture was subsequently carried by the Saracens from Baghdad, Tabriz, Aleppo, and Alexandria into Sicily, and examples are extant of the Saracenic silks of Sicily of the 12th century. Roger, king of Sicily, also carried a large number of silk manufacturers from Greece to Palermo in A.D. 1147. From Sicily the manufacture spread into Italy and established itself at Florence, Lucca, Venice, Milan, and Genoa. From Italy Louis XI., in 1480 introduced the art into France at Tours, and in 1520 Francis I., having got possession of Milan, established it at Lyons. Silk was made in England in the reign of Henry VI., but the great encouragement to its manufacture in this country was derived from the revocation of the Edict of Nantes by Louis XIV. in 1685, which drove about 50,000 of the best French workmen to seek a refuge in England, where a large number of them established themselves at Spitalfields. When the old East India Company began to import Indian silks with other eastern stuffs into England, a great deal of exasperation was felt by the home manufacturers of cotton, woollen, and silken goods; and at length the Legislature of this country was constrained to pass the scandalous law of 1700, already referred to, by which it was enacted "that from and after the 29th day of September, 1701, "all wrought silks, Bengalls, and stuffs mixed with silk or herba, "of the manufacture of China, Persia, or the East Indies, and "all calicoes, painted, dyed, printed or stained there, which are "or shall be imported into this kingdom, shall not be worn or "otherwise used in Great Britain; and all goods imported after "that day, shall be warehoused or exported again."

Whether the Saracens found the manufacture of silk already established in India or not, it is evident that they largely influenced the designs of its ornamentation in that country. *Kincobs* are now made in Ahmedabad and Benares, identical in design with old Sicilian brocades; and the Saracenic Sicilian silks abound

with designs which prove, as I shall presently shew, their origin in Assyrian and Indian art. We know that the Saracens and Moors introduced colonies of Persian, and it may be presumed Indian, workmen into Spain to help them in their architecture: we know that Greek architects built some of their mosques at Cairo, and that the Mogul Emperors of Delhi introduced Italian and French artists and workmen to design some of their great buildings in India. Not only the *Taj*, but nearly every large native building in Rajputana, is decorated with most exquisite mosaics, never seen by Europeans, of the period of Austin de Bordeaux. Thus styles of art act and react upon one another, and nothing throws more light on the affinities and development of the modern decorative arts of Europe and India than the history of the introduction, by Justinian, of the silk manufacture from China into the West.

Embroideries.

Indian embroidery is done on silk, velvet, cotton, wool, and leather; and the embroidery on wool of Cashmere, both loom-wrought and with the needle, is of historical and universal fame. The Cashmere shawl trade is of the highest antiquity and importance, and it is very deplorable that it should have been recently checked, owing to the use of French designs and the Magenta dyes in the manufacture. The cone pattern with its flowing curves and minute diaper of flowers, characteristic of these shawls, is well known. According to Mr. Baden Powell ["Manufactures of the Punjab," pp. 39–40], the natives distinguish the ornamentation of the shawls by different names. The *hashia* or border is disposed along the whole length, and according as it is single, or double, or triple, gives its particular denomination to the shawl. By the term *pala* is meant the whole of the embroidery at the two ends, or, as they are technically called, the heads of the shawl. The *zanjir* or chain runs above and below the principal mass of the *pala*. The *dhour*, or running ornament, is situated on the inside of the *hashia* and *zangir*, enveloping the whole field of the shawl. The *kunjbutha* is a corner ornament of clustering flowers. The *mattan* is the decorated part of the field or ground, and the *butha*, the generic term for flowers, is specifically applied alone to the cone ornament, which forms the most prominent feature of the *pala*. Sometimes there is only one line of these cones. When there is a double row, the *butha* is called *dokad*, *sekhad*, up to five, and *tukadar* above five. A special variety of this ornamentation is designed for the Armenian market, known by the name of *Tara Armeni*. Besides shawls, an immense variety of articles are made in Cashmere of shawl stuff. The wool employed in the manufacture is the down called *pushm* of the so-called Cashmere goat of Ladak: and lately the weaving of *pushmina* shawls has been introduced from Cashmere into Lucknow. The finest of the woollen stuffs called *patu* is made of camel's hair, and is a true Camlet therefore. It is embroidered in Cashmere and the Punjab, Scinde, and Delhi, and is

generally made up in loose burnous-like robes called *chogas*, much used by English officers as dressing gowns. Ctesias compares camel's hair for its softness to Millesian wool, which Theocritus describes as "softer than sleep." A rough but remarkably durable *patu* is made from goat's hair. Black sackcloth blankets, called *kambhli*, are woven all over India.

Muslin is embroidered at Dacca and Patna; and at Delhi also, in colored floss silk. Rich broidered work is made in Scinde in colored silk thread and gold and silver. The embroidery of Cutch, in colored silk thread, very rarely seen, is of the same style as the well-known embroidery of Resht on the Caspian. Either the Armenian merchants introduced the style into Cutch, or from Cutch into Persia. Gold is also used in Cutch for embroidery in the Persian style of Ispahan and Delhi. The gorgeous gold embroidered velvets (*makhmal*) of Lucknow, and of Gulbargah, Aurungabad, and Hyderabad in the Deccan, used for canopies of costly state, umbrellas of dignity, elephants' cloths, horse cloths, and state housings and caparisons generally, are largely represented in the Prince's Collection. In form they have remained unchanged from the earliest periods of Indian history, but their sumptuous gold scroll ornamentation is in design distinctly of Italian 16th century origin. The Portuguese were in the habit of sending satin to India to be embroidered by natives in European designs.

It would appear that carpets originated in embroidery, and that carpets were first used, like embroideries, for hangings and palls. The earliest notices we have of this art are in the Bible, in the accounts in the Pentateuch of the furnishing of the Tabernacle and elsewhere. In Judges v. 30, we have in the song of Deborah, —"Have they not sped? have they not divided the prey, to every "man a damsel or two; to Sisera a prey of divers colours of "needlework, of divers colours of needlework on both sides, "meet for the necks of them that take the spoil?"—the description of a style of embroidery, both needle-wrought and loom-made, still held in great esteem in India and Persia. In Ezekiel xxvii. 23, 24, we read "Haran and Canneh and Eden [*i.e.* Aden], the "merchants of Shebah, Asshur, and Chilmad, were thy merchants. "These were thy merchants in all sorts of things, in blue clothes "and broidered work, and in chests of rich apparel, bound with "cords and made of cedar, among thy merchandise,"—a passage which is thought to refer to Cashmere shawls imported into Tyre through Aden. The great demand in ancient times for broidered work was for the hangings and veils of temples, and the art originated with the women who wove these veils for the temples of Egypt, India, Babylonia, and Phœnicia. To Greece and Rome embroidery came from Phrygia, and hence an embroiderer was called in Rome *Phrygio*, and embroidered robes *Phrygiones*. Gold broidered work was called *auriphrygium*, whence the old English word Orphrey. Such work is now called "Passing." In India we find all the varieties of needlework that are found in Europe: *opus plumarium* or feather stitch, *opus pulvinarium* or cross stitch, *opus Anglicum* or chain stitch, and

worked in circular lines also, but never rubbed down to obtain an effect of relief, *opus pectineum* or woven work in imitation of embroidery, and *opus consutum, appliqué* or cut work, in which the ornamental figures are cut out in separate pieces of silk or cloth, and sewn on to the stuff to be embroidered. These *draps entaillez* are obviously the origin of the Persian carpets of Mashhad. The parrots, rabbits, tigers, and fawns represented upon them have evidently been imitated from figures of these birds and beasts cut in cloth for *appliqué* work.

In many parts of India muslin is very beautifully embroidered with green beetle wings and gold. In the Prince's Collection is a piece of muslin embroidered in gold and painted spangles and imitation pearls, with a perfect effect of reality and richness. The embroidered leather work of Guzerat has already been noticed. Marco Polo, bk. iii. ch. xxvi., writing of "Gozurat" says: "They "also work here beautiful mats in red and blue leather, exquisitely "inlaid with figures of birds and beasts, and skilfully embroidered "with gold and silver wire. They are marvellously beautiful "things; they are used by the Saracens to sleep upon, and "capital they are for that purpose." This was written 600 years ago, and is still as true to the work described as if it had come by the last mail from Bombay. But the most wonderful piece of embroidery ever known was the *chadar* or veil made by order of the late Guicowar, Kunderao, of Baroda for the tomb of Mahommed at Medina. It was composed entirely of inwrought pearls and precious stones, disposed in an Arabesque pattern, and is said to have cost a crore of rupees. Although the richest stones were worked into it, the effect was most harmonious. When spread out in the sun it seemed suffused with a general iridescent pearly bloom, as grateful to the eyes as were the exquisite forms of its arabesques.

Carpets.

Indian carpets are of two kinds, cotton and woollen; generally they are classed as cotton *daris* and *satrangis* and woollen rugs and carpets, but in fact *daris* is the native word for a rug, and *satrangi* for a carpet. *Daris* and *satrangis*, however, are perfectly distinct in style and make from the usual Indian pile carpets and rugs. *Daris* and *satrangis* are made of cotton, and in pattern are usually striped blue and red, or blue and white, or chocolate and blue; and often squares and diamond shapes are introduced, with sometimes gold and silver, producing wild picturesque designs like those seen on the bodice and apron worn by Italian peasant women. They are made chiefly in Bengal and Northern India, and, like the loom-made *dhotis* and *saris*, illustrate the most ancient ornamental designs in India, perhaps earlier even than the immigration of the Aryas. The manufacture of pile carpets was probably introduced into India by the Saracens. They certainly introduced it into Europe, where, in the Middle Ages, carpets of the nature of woollen stuffs, ornamented somewhat in the manner of *draps entaillez*, were called Sarracinois. Towards the end of the 12th century the Flemings began to weave pictured tapestries, but

it was not until the reign of Henry IV., A.D. 1596, that the modern carpet manufacture was introduced from Persia into France. It is from Persia that the Saracens must have derived the art of making pile carpets, for nearly all the patterns on them in India and elsewhere can be traced back to Persian originals. In the paintings of the old masters we see, in the representation of oriental carpets on floors, and hung out of windows, the origin of the designs afterwards made vulgar by their imitation in "Brussels carpets." But it is not easy to determine when woollen pile carpets were first made in Persia. Homer mentions carpets, and by their present name *τάπητα*, as in Il. ix. 200.

> "With that the chiefs beneath his roof he led,
> And placed in seats with purple carpets [*τάπησί τε πορφυρέοισιν*] spread."

And Od. iv. 124:

> "To spread the pall [*τάπητα*] beneath the regal chair,
> Of softest wool [*μαλακοῦ ἐρίοιο*] is bright Alcippe's care.'

And Od. iv. 298:

> "And o'er soft palls of purple grain, unfold
> Rich tapestry [*τάπητας*] stiff with inwoven gold."

And Od. x. 12:

> "on splendid carpets lay."
> [Εὖδοισ' ἔν τε τάπησι.]

Pliny, where [Book viii. ch. 73–74 [48]] he describes the different kinds of wool and their colours, and different kinds of cloths, says: "The thick flocky wool has been esteemed for the "manufacture of carpets from the earliest times; it is quite clear "from what we read in Homer that they were in use in his time. "The Gauls embroider them in a different manner from what is "practised by the Parthians. Wool is compressed also for making a "felt, * * * and the refuse, too, when taken out of the vat is used "for making mattresses, an invention, I fancy, of the Gauls. * * "Our ancestors made use of straw for the purpose of sleeping "upon, just as they do at present when in camp. The *gausapa* "has been brought into use in my father's memory, and I myself "recollect the *amphimalla* [napped on both sides] and the long "shaggy apron being introduced."

It is evident that some sort of baize, or felt, or drugget, used as tapestry for the wall, and for coverlets for beds, as well as for rugs or carpets, is meant in all these passages. Arrian in his account of the tomb of Cyrus [Bk. vi. 29], which is taken from Aristobulus, who was not only an eye-witness of it, but was ordered by Alexander to repair it, says: "Within this edifice was "the golden coffin, wherein the body of Cyrus was preserved, "as also the bed whose supporters were of massy gold curiously "wrought, the covering thereof was of Babylonian tapestry, the "carpets underneath of the finest wrought purple; the cloak and "other royal robes were of Babylonian, but the drawers "[*pijamas*] of Median workmanship. Their colour was chiefly "purple, but some of them were of various dyes. The chain "round his neck, his bracelets, his earrings, and his sword, were

" all of gold, adorned with precious stones. A costly table was also " placed there, and a bed whereon lay the coffin, which contained " the king's body." Athenæus has many allusions and references to carpets, and in the account which he gives [Bk. v. ch. 27], from Callixenus the Rhodian [B.C. circa 280] of a banquet given by Ptolemy Philadelphus at Alexandria, the carpets which were laid in the tent are accurately described: "There were also golden couches, " with the feet made like sphinxes, on the two sides of the tent, a " hundred on each side. * * * And under these there were strewed " purple carpets of the finest wool, with the carpet pattern on both " sides. And there were handsomely embroidered rugs, very " beautifully elaborated. Besides this, thin Persian cloths covered " all the centre space where the guests walked, having most ac- " curate representations of animals embroidered on them." It is not possible to say what kind of carpets those mentioned by Arrian were, beyond that they were Babylonian; but the carpets described by Callixenus are the woollen *galims* still made in Kermanshah, the same on both sides, the "*Babylonica texta*" of Martial, and the embroidered *shamyanas*, or canopy cloths [*aulea*, Arras], of which a superb one is shewn by the Prince of Wales, still made in Persia, and evidently the "*Babylonica peristromata*," and "*consuta tapetia*," "Babylonian hangings," and "embroidered " tapestry" of Plautus. As velvet [*makhmal*] probably originated in Central Asia, and certainly felt, I think it very likely that it was there also that the Turkish tribes first developed the art of sewing tufts of wool on the strings of the warp of the carpets they had learned to make from the Persians, and that the manufacture of these pile carpets was thus introduced by the Saracens into Europe from Turkestan through Persia. The Turks were driven to the invention by the greater coldness of their climate. These pile carpets are called in India specifically *kalin* and *kalicha*. The foundation for the carpet is a warp of the requisite number of strong cotton or hempen threads, according to the breadth of the carpet, and the peculiar process consists in dexterously twisting short lengths of colored wool into each of the threads of the warp so that the two ends of the twist of colored wool stick out in front. When a whole line of the warp is completed, the projecting ends of the wool are clipped to a uniform level, and a single thread of wool is run across the breadth of the carpet, between the threads of the warp, just as in ordinary weaving, and the threads of the warp are crossed as usual; then another thread of the warp is fixed with twists of wool in the same manner; and again a single thread of wool is run between the threads of the warp, across the carpet, serving also to keep the tags of wool upright, and so on to the end. The lines of work are further compacted together by striking them with a a blunt fork [*kangi*], and sometimes the carpet is still further strengthened by stitching the tags of wool to the warp. Then the surface is clipped all over again, and the carpet is complete. The workmen put in the proper colours either of their own knowledge or from a pattern. No native, however, works so well from a pattern as spontaneously. His copy will be a fac-simile

of the pattern, but stiff, even if it be a copy of his own original work. His hand must be left free in working out the details of decoration, even from the restraint of the examples of his own masterpieces. If he is told simply, "Now I want you to "make something in this style, in your own way, but the best "thing you ever did, and *you may take your own time about it*, "and *I will pay you whatever you ask*," he is sure to succeed. It is haggling and hurry that have spoiled art in Europe, and are spoiling it in Asia. The loveliest mosque in Bombay was built without a plan, the workmen day by day tracing roughly on the ground the designs by which they worked. The best Oriental pile carpets are those of Persia, particularly those made in Khorassan, Kirman, Feraghan, and Kurdistan, and of Turkey, made chiefly at Ushak in Asia Minor, near Smyrna. In India they are chiefly made in Cashmere, Afghanistan, the Punjab, Baluchistan, and Scinde, at Agra, Mirzapur, Jubbulpore, Hyderabad, and Warangal in the Nizam's Dominion, and on the Malabar coast and at Masulipatam. Velvet carpets are also made at Benares and Murshedabad, and silk pile carpets at Tanjore and Salem. The Indian carpets shewn on the present occasion are exhibited entirely by private London firms, Messrs. Vincent Robinson & Co., Messrs. Watson and Bontor, Messrs. Farmer and Rogers, and others; and the extent and completeness of their exhibitions is a sufficient evidence of the important trade in them which has sprung up since 1851, when for the first time, through the liberality of the Indian Government, they were brought prominently to the notice of English people. Unfortunately there has been a great falling off in the quality and art character of Indian carpets since then, partly, no doubt, owing to the desire of the English importers to obtain them cheaply and quickly, but chiefly owing to the disastrous competition of the Government jails in India (generally under the direction of energetic young Englishmen) with the native weavers.

The *Afghanistan* carpet exhibited by Messrs. Vincent Robinson & Co. is probably really of Mash-had manufacture. It is a rare example of the antique Persian style in carpets. The central ground is of Kermes red, as brilliant as when first woven, covered with large tulips in shades of blue, green, and yellow. The border ground is of a fine (indigo and yellow) green. The introduction of the characteristic cloud pattern among the conventional tulips in this carpet is of peculiar interest, as indicative of the Tartar influences so clearly marked in Persian *faience* of the 16th century.

The evil of cheapening sumptuary articles unsuited to the wants of the multitude is well illustrated by the *Lahore* jail carpets exhibited. The reputation which Indian carpets gained at the Great Exhibition of 1851 gave an impetus to their production which, had it been wisely fostered, might have led to their use in every house in Europe belonging to the wealthy and cultivated. The proper course would have been to allow the number of caste weavers engaged in the carpet manufacture to increase gradually with the demand for their carpets. But in an

evil hour the Indian Government, thinking only of how to effect small economies, hit upon the plan of using their jails for the supply of the now lucrative trade in carpets, which of course they can afford to sell at a lower price than the caste weavers. No doubt economies were effected; but the caste weavers were undersold, impoverished, and in some districts have become extinct, and with them have perished, perhaps for ever, the local tradition of their art. Its inspiration has certainly not descended on the jails, and, when this is once found out, as it is at last being found out in England, the manufacture of Indian carpets in the Government jails will cease. The results, therefore, of the suicidal competition of the Government with the caste weavers will have been to check in some degree the pile carpet manufacture in England, and in all the districts affected by it to degrade the manufacture in India, and at last extinguish it altogether. The examples exhibited in 1851, which gained their reputation for Indian carpets, were admired for the originality, and great beauty of their designs, the harmony of their coloring, and their special fitness for the houses of the cultivated, the wealthy, and the great. These qualities require many elements for their production quite inconsistent with cheapness, and a quick, hasty, and promiscuous demand. To stimulate such a trade requires a complete knowledge of the conditions of the carpet manufacture in India, and experienced skilful direction. But what did the Indian Government do? They handed this great historical craft, this glorious art, over to the Thugs in their jails, and the Thugs strangled it. That they were felons and jail-birds was their supreme qualification for making carpets, to the ruin of the honest caste weavers in whose families the manufacture had been cultivated and perfected by practice through a hundred generations of the lives of men. And these Thugs again work under the direction of young military or medical officers, who, except by mere accident, are utterly incapable of judging of the various art considerations involved in the peculiar manufacture of oriental carpets. The whole question has indeed been considered hitherto by the Indian Government solely with a view to balancing its budgets. The place of the great *rajahs* of the bad old times (but good for art), who encouraged the weavers to make carpets for their own use and luxury, has been usurped by a superintendent of jails, careful only to make two ends meet, leaving the future to take care of itself. The most saleable article is produced, and at the cheapest rate, and for the first person who comes for it: and the petty jealousies of the English wholesale importers are adroitly turned to account by the Jail Superintendents to stimulate the demand for what are now no longer called carpets, but characteristically jail "goods." The whole problem, with these energetic Superintendents, resolves itself into the thoroughly commercial question of how to make a certain number of running feet of carpeting *per annum* at so many rupees per square yard. The effect of the system is seen in these Lahore (Jail) carpets. The wool of which they are made is good. The dyes with which they are colored are hideous, and the arrangement of the colours harsh and inharmonious. The patterns

have no local character, being crude transcripts from Persian copies, though not copied in Persian dyes, but in local ones, compounded, I could believe, out of the jail medical stores. It is this practice of transplanting a pattern from a district in which it is indigenous to another of perfectly differing natural conditions, and historical and art traditions, which, more than anything else, has led to the degradation and decline of the Indian carpet manufactures in all the districts affected by the pernicious example of the jails. The material used at Lahore is of a nature to lend itself to the large bold patterns natural to the Punjab, Baluchistan, and Scinde, and the North-west Provinces of India generally. But when the jails undertook to make Thug carpets, Persian patterns were in the market, and without taking thought for the morrow the competitive Jail Superintendents rushed into the anomaly of working in coarse materials minute patterns which require fine soft wool, and delicate stitches, to develop their right effect. The Jail Superintendents also, resolved at all hazards to undersell the caste weavers, have imported the use in their carpets of the Magenta series of dyes, which have proved the ruin of every art manufacture into which they have been introduced. The end of all these errors, political, economical and artistic, is sufficiently foreshadowed in the fate which has befallen the Cashmere shawl trade under French patronage; unless, indeed, the Government of India quickly awakens to the knowledge that an industrial art which it has taken centuries to mature cannot possibly be dealt with in the same way as the door mat manufactory of Wakefield Jail. People do not want door mats from India, but art carpets.

The house of Vincent Robinson & Co. exhibits a *Cashmere* carpet which is a good example of the corruption of native designs under European influences. The large scroll laid about its borders in such agonised contortions is evidently copied from the shawl patterns introduced by the French houses into Cashmere about ten years ago. The wool of these modern Srinagar carpets is good, and the texture of the carpets themselves is not bad, but it is hardly possible that they can ever again be made to satisfy a critical taste. The colours introduced are not suited for the floor of a room, particularly the green, even if they were harmoniously blended. The floor of a furnished room, in which the great need is to see the furniture distinctly, can scarcely be too grave in tone, and it is evident that the Cashmere dyes are fitted only for shawls, and *portières*, and tapestries for walls, where it is a pleasure to the eye to be attracted by lively coloring.

The *Scinde* carpets are the cheapest, coarsest, and least durable of all that are made in India. Formerly they were fine in design and coloring, but of late years they have greatly deteriorated. The cheap rugs, which sell for about 9*s.* each, are made with the pile (if not altogether) of cowhair, woven upon a common cotton foundation, with a rough hempen shoot. The patterns are bold and suited to the material, and the dyes good and harmonious.

The *Baluchistan* carpets and rugs are made of goatshair, which gives them their singularly beautiful lustre, finer even than that of the Indian silk carpets, and more subdued in tone, although the

dyes used in Baluchistan are richer. The patterns are usually of the fantastic geometrical character found in Turcoman rugs, from which the patterns of the early "Brussels carpets" were derived. They are laid on either a deep indigo or deep madder red ground, and traced out in orange brown and ivory white, intermixed with red, when the ground is blue, and with blue, when the ground is red. The ends terminate in a web-like prolongation of the warp and woof beyond the pile; and when striped in colours or worked in a small diaper form a most picturesque fringe.

The *Agra* Jail carpet, exhibited by Messrs. Edward Kilburn and Co., deserves a note of commendation for the fine proportion of its border to the centre. The borders of modern oriental carpets are generally made too narrow. In the mosaic floors of the Greeks and Romans, as seen at Pompeii, which were evidently suggested by Oriental tapestry, the border was always remarkably broad, and in the older Persian carpets it is often a yard deep, and more.

The famous *Jubbulpore* carpets have deteriorated in quality and art in the most extraordinary manner since the establishment of the School of Industry at that Station, the influence of which has been equally prejudicial with that of the jails. The foundation, as now scamped, is quite insufficient to carry the heavy pile which is a feature of this make; and is moreover so short in the staple as to be incapable of bearing the tension even of the process of manufacture. Jubbulpore carpets often reach this country which will not bear sweeping, or even unpacking. I know of two which were shaken to pieces in the attempt to shake the dust out of them when first unpacked. The designs once had some local character, but have lost it during the last four or five years.

Benares Jail carpets have a texture very much like those of Jubbulpore and are equally untrustworthy. In fact the most durable jail carpets are those of Lahore, and it is this which adds to the aggravation of their hideousness.

In *Mirzapore* carpets we again find the evidence of the indiscriminate cheapening effects of the Jail system. In the Paris Exhibition of 1867 Mirzapore carpets were still shewn of fine texture, and good coloring, and serviceable wear; the designs too were suited to the coarse wool used in that district. But, in the carpets now sold, the materials are not so well chosen, the texture is coarser, and the colours are crude; and it is within proof to state that a Mirzapore carpet as now made, and sold in Europe at about 18*s.* the square yard, is one of the least economical carpets which people of moderate means could lay down on their floors. The staple is so short, and the texture so loose, that it will not bear the wear and tear of a middle-class English household; and common sense is of course the backbone of good taste in furnishing. Three years will wear out any Mirzapore carpet now made. Those made ten years ago will still be in use twenty years hence, and full of dignity to the end. But as they cost twice the money, there's the rub, fatal to the once great manufacture of this district.

Hyderabad carpets have also felt the influence of the jails. In the Exhibition of 1851 the very finest rugs exhibited were from

Warangal, about 80 miles east of Hyderabad. The peculiarity of these rugs, of which one remains in the India Museum, was the exceedingly fine count of the stitches, about 12,000 to the square foot. They were also perfectly harmonious in coloring, and the only examples in which silk was ever used in carpets with a perfectly satisfactory effect. The brilliancy of the colours was kept in subjection by their judicious distribution and the extreme closeness of the weaving, which is always necessary when the texture is of silk. All this involves, naturally, great comparative expense, not less than 10*l.* per square yard; and it is not surprising, therefore, that in the competition with the Thug carpets of the jails, the stately fabrics of Warangal, the ancient capital of the Andhra dynasty of the Deccan, and of the later Rajas of Telingana, have died out, past every effort to revive them. Surely the Government which has spent so much money in introducing South Kensington Schools of Art into India, might make an annual grant for the purchase of the masterpieces of Indian local manufacturers, which they should present to any native prince or gentleman to whom they wished to shew great honour. A few thousand pounds spent in this way every year would have a most beneficial effect in sustaining many local traditional arts in India now nearly dying out, even of the very recollections of men. A carpet from the Warangal district is exhibited among the Prince's presents, but it is not of the old manufacture at all. The colours are too strong, the indigo very much too strong for the surrounding tones of grey, green, and yellow; and the large leaf pattern stares obtrusively from the crude madder red ground. It compares most unfavourably with an old Warangal carpet exhibited by Messrs. Vincent Robinson & Co.

The *Mysore* Jail carpets are like unto the jail carpets of Benares and Jubbulpore.

The jail carpets of *Bangalore* are coarse and clumsy in the extreme, and in coloring only less execrable than those of Lahore.

The carpets of *Masulipatam* were formerly amongst the finest produced in India, but of late years have also been corrupted by the European, chiefly English, demand for them. The English importers insisted on supplying the weavers with cheaper materials, and we now find that these carpets are invariably backed with English twine. The spell of the tradition thus broken, one innovation after another was introduced into the manufacture. The designs which of old were full of beautiful detail, and more varied than now in range of scheme and coloring, were surrounded by a delicate outline suggested as to tint by a harmonising contrast with the colours with which it was in contact. But the necessity for cheap and speedily executed carpets for the English market has led to the abandonment of this essential detail in all Indian textile ornamentation. Crude inharmonious masses of unmeaning form now mark the spots where formerly varied, interesting, and beautiful designs blossomed as delicately as the first flowers of spring: and these once glorious carpets of Masulipatam have sunk to a mockery and travestie of their former selves.

The carpets of *Malabar* would seem to be the only pile woollen carpets made in India, of pure Hindu design, and free at present from European as from Saracenic influences. They are made of a coarse kind of wool peculiar to the locality, and are distinguished by their large grandly colored patterns. The texture of the wool is exactly suited to the designs used, which are grey in tone, colossal in proportion, and wonderfully balanced in harmonious arrangement. No other manufacture of carpets known could hold a pattern together with such a scheme of coloring, and scale of design. The simplicity and felicity shewn in putting the right amount of colour, and exact force of pattern, suited to the position given them, are wonderful, and quite unapproachable in any European carpets of any time or country. They satisfy the feeling for breadth and space in furnishing, as if made for the palaces of kings.

These are not the only fine carpets still made in India. The collections exhibited by Messrs. Vincent Robinson & Co. prove that carpets of uncontaminated native designs and integrity of quality are still made by the caste weavers of India, but of varieties not yet recognised by huckstering European dealers, and obtained from villages far away from English stations and railway lines. Two carpets, from a little known district in the Madras Presidency, exhibited by Messrs. Vincent Robinson, & Co., are equal to anything ever produced in the Deccan. The colours are perhaps a little more brilliant than was observable in the memorable examples from the same district shewn in the Exhibition of 1851, now in the India Museum (which possesses also the most superb Afghanistan and Kirman carpets); but this brilliance is really due rather to want of age, for the details have, in a high degree, all the varied play of colour, and charm of pattern of the older carpets, and time only is required to mellow them to perfection. These choice specimens I shall not further indicate nor the places of their production, and I trust that the exhibitors of them will also keep their secret, which is the only protection they can give these fabrics, and their hereditary weavers (the Mahommedan descendants of Persian settlers), from the withering competition of the Indian Government.

It is beyond the purpose of this Handbook to notice other Oriental carpets than Indian, but it is impossible altogether to avoid a general reference to the selection of Persian and Turcoman carpets exhibited by Messrs. Vincent Robinson & Co., so remarkable are they for their great excellence of quality and design. The Kurdistan "Gift Rugs," Kermanshah *galims*, Daghestan tent hangings, and camels hair carpets, of "*moukadem* manufacture," the Yarkand rugs, and Bokhara carpets shewn by this firm are of the finest quality. The large Hamadan Carpet is absolutely unique in character and style. It is almost as thick as a "*moukadem*" carpet. An irregular lozenge form, an island of bright clustering flowers, of which the prevailing colours are red and blue, adorns the centre, while the wide extended ground of yellow, in irregular shades, surrounds it like a rippling amber sea; and there are blue pieces in the corners, within the blue border, worked

in arabesques. It is a carpet, however, which it will be difficult to put into a European room, as its surface is too beautiful to allow of its being broken by furniture. It is a carpet to be looked at like a golden sunset, and it was a sacrilege to remove it from the mosque where it evidently was once laid, under the great dome. *Beati possidentes.*

Messrs. Vincent Robinson & Co. exhibit a general Persian collection of pottery, brass-work, and fabrics, all selected with the greatest discrimination, and of the highest artistic value. Messrs. Farmer and Rogers also exhibit a general collection of Indian textile fabrics and miscellaneous small wares, and some of the finest Cashmere shawls.

Felts, called *nammads* or *namdahs*, are largely imported into India from Khotan by way of Leh. Messrs. Vincent Robinson & Co. exhibit some felts from Tabriz, which are beautifully ornamented with colored wools felted into them in regular arabesque designs. The manufacture of felt is a speciality of the town of Jarwal in the Bahraich district of Oudh.

Mats, called *chatai*, are made all over India. The mats of Palghat on the Malabar coast are remarkable for their strength, and those of Midnapore near Calcutta, several of which are exhibited by Messrs. Vincent Robinson & Co., are admired wherever they are seen for their fineness and the classical design of the mosaic like patterns of stained grass.

Apart from the natural beauty of the dyes used, and the knowledge, taste, and skill of the natives of India in the harmonious arrangement of colours, the charm of their textile fabrics lies in the simplicity and treatment of the decorative details. The knop or cone and flower pattern appears universally, but infinitely modified, never being seen twice under the same form, and the *seventi* and Lotus, which has been reduced, through extreme conventionalisation to one pattern. Besides, we have the Shoe flower, the Parrot and Peacocks, and Lions and Tigers, and Men on Horseback, or on foot, hunting or fighting. These objects are always represented quite flat as in mosaic work, or in *draps entaillez*, and generally symmetrically and in alternation. The symmetrical representation of natural objects in ornamentation and their alternation seems through long habit to have become intuitive in the natives of the East. If you get them to copy a plant, they will peg it down flat on the ground, laying its leaves and buds and flowers out symmetrically on either side of the central stem, and then only will they begin to copy it. If the leaves and flowers of the plant are not naturally opposite, but alternate, they will add others to make it symmetrical, or at least will make it appear so in the drawing. Nothing at first used to provoke me more when botanising in India, until subdued by the special charm of the drawings themselves. The intuitive feeling for alternation is seen in their gardens and heard in their music, and is as satisfactory in their music as in their decoration, when heard amid the association which naturally call it forth, as when benighted native travellers hail the rising moon. When the same form is used all over a fabric, the interchange of light and shade and the effect of alter-

nation, are at once obtained by working the ornament alternately in two tints of the same colour. Each object or division of an object is painted in its own proper colour, but without shades of the colour, or light and shade of any kind, so that the ornamentation looks perfectly flat, and laid like a *mosaic* in its ground. It is in this way that the natural surface of any object decorated is maintained in its integrity. This, added to the perfect harmony and distribution of the coloring, is the specific charm of Indian and Oriental decoration generally. Nothing can be more ignorant and ridiculous than the English and French methods of representing huge nosegays, or bunches of fern leaves tied together by flowing pink ribbons, in light and shade, on carpets, with the effect of full relief. One knows not where to walk among them. Constantly are also seen perfectly shaped vases spoiled by the appearance of flowers in full relief stuck round them, or of birds flying out from them. Such egregious mistakes are never made by the Indian decorative artist. Each ornament, particularly on fabrics, is generally traced round also with a line, in a colour which harmonises it with the ground on which it is laid. In embroideries with variegated silks, for instance, on cloth or satin or velvet, a gold or silver thread is run round the outline of the pattern, defining it and giving a uniform tone to the whole surface of the texture. Gold is generally laid on purple, or in the lighter *kincobs* on pink or red. An ornament on a gold ground is generally worked round with a dark thread to soften the glister of the gold. In carpets, however, gay in colour, a low tone is secured by a general black outline of the details. All violent contrasts are avoided. The richest colours are used, but are so arranged as to produce the effect of a neutral bloom, which tones down every detail almost to the softness and transparency of atmosphere. The gold-broidered, snuff-colored Cashmere shawl in the Prince's Collection presents this etherial appearance. Light materials are lightly coloured and ornamented, heavier more richly, and, in the case of apparel, both the coloring and the ornaments are adapted to the effect which the fabric will produce when worn and in motion. It is only through generations of patient practice that men attain to the mystery of such subtleties. It is difficult to analyse the secret of the harmonious bloom of Indian textures, even with the aid of Chevreul's prismatic scale. When large ornaments are used, they are filled up with the most exquisite details, as in the cone patterns on Cashmere shawls. The vice of Indian decoration is its tendency to run riot, as in Indian arms, but Indian textile fabrics, at least, are singularly free from it, and particularly the carpets. They are threatened, as has been shewn, by quite another danger.

Pottery.

Purest in art, in directness and simplicity of form and decoration, of all its homely arts is the pottery of India, the Hindu pottery of Madura and the Indian pottery of the Punjab and Scinde. Unfortunately, there is nothing of these two styles to shew. Pottery is made everywhere in India, and has been from before the

age of Menu. The red earthenware pottery of Travancore and Hyderabad is well known, and the red glazed pottery of Dinapur, which is glazed with a sort of varnish made of *Morinda* bark, ducks' eggs, and quicklime, and the black glazed pottery of Azungarh, and imitation Bidiri of Surat. But all these varieties of fancy pottery, as distinguished from the primitive water-vessels thrown everywhere, are of an insignificant and almost meretricious character; and only the pottery of Madura and the Punjab and Scinde can be classed as art pottery, and as such it is of the highest excellence. The Madura pottery is in the form generally of water bottles, with a globular bowl and long upright neck; the bowl being generally pierced so as to circulate the air round an inner porous bowl. The outer bowl and neck are rudely fretted all over by notches in the clay, and are glazed either dark green or a rich golden brown. The Scinde and Punjab pottery is egg-shaped, turban, melon, and onion shaped, in the latter the point rising and widening out gracefully into the neck of the vase. They are glazed in turquoise, of the most perfect transparency, or in a rich dark purple, or dark green, or golden brown. Sometimes they are diapered all over by the *pâte-sur-pâte* method, with a conventional flower, the *seventi*, or Lotus, of a lighter colour than the ground. Generally they are ornamented with the universal cone and flower pattern, in compartments formed all round the bowl, by spaces alternately left uncolored, and glazed in colour. Sometimes a wreath of the knop and flower pattern is simply painted round the bowl on a white ground. Every endeavour was made to represent this pottery at the Paris Exhibition, with the view of bringing it into European demand; but the Bombay Government, which was intrusted with the commission, has sent instead an overwhelming collection of the pottery of the Bombay School of Art, which began with a laudable endeavour to naturalise the manufacture of Scinde pottery in Bombay, but has ended, it would seem, by getting the natives all over Western India to imitate the hardware jugs of Messrs. Doulton.

The Bombay School of Art has been singularly fortunate in the gentlemen who have directed its operations. Mr. Terry has a quick sympathy with native art, Mr. Kipling * is an artist of the highest accomplishment, and Mr. Griffiths a painter of decided genius, whose works have been seen at successive Royal Academy exhibitions. It is therefore hard to explain why there should have been any relaxation from the first purpose of the Directors of the School in introducing the manufacture of Scinde pottery into Bombay. Of course there is little harm done if their new ware is not passed off for Scinde and Punjab pottery. It will be very interesting

* Mr. Kipling has been at Lahore for the last three years as Curator of the Central Museum; and in Bombay had nothing to do, directly, with the School of Art pottery. His work there was to carve Frere Town with foliage in stone; and I mention his name here only to shew the happy influences under which the Bombay School of Art has been raised to its present position. I have added, as Appendix E., Mr. Kipling's Report on the Multan and Peshawur pottery, sent by him to the Exhibition, but which arrived too late for me to properly notice.

if they succeed in establishing a new manufacture of a specific local character. To some of it, in which the designs are adapted from the Ajunta cave paintings and Sawuntwari playing cards, they have succeeded in giving a marked local character, and it is interesting to see Hindu mythological subjects drawn in the native style by practised English draughtsmen. But the imitations of Doulton ware, in spite of the masterly drawing of the flower and leaf decorations, are miserable failures. It is quite a misapplication of Doulton's methods to apply them to friable Indian earthenware. The shapes also of the Bombay School of Art pottery are detestable, taken neither from Scinde nor Western India, but from Chinese sugar jars, Japanese flower vases, and English jam and pickle pots. After all, it shews worst in its imitation of Scinde pottery, from its falling so far below its originals; and this is perhaps why the effort was not persevered in. But the causes of failure are clear. The shapes of the pots are not Scindian, the glaze is used too thickly, and the patterns are applied in stencil, which gives them a thin, stiff, poverty-stricken character. In Scinde the pattern is pricked out on paper, and drawn by laying the paper on the surface of the jar and dusting it along the prickings. This gives a sufficient outline of the design to enable the decorator to paint it on with the greatest freedom and dash, *pâte-sur-pâte*, and the effect is rich, free, and harmonious beyond belief in articles which sell for fourpence, sixpence, and one shilling each on the spot. These can fortunately never be undersold. The chief seats of the manufacture are at Lahore and Multan, Hyderabad in Scinde, Hala, Karachi, and Tatta, and for encaustic tiles at Saidpur and Bulri.* Mr. Drury Fortnum in his report, on the pottery at the International Exhibition of 1871, observes of the Scinde pottery: "The turquoise blue "painted on a paste beneath a glaze, which might have been "unearthed in Egypt or Phœnicia—a small bottle painted in blue "or white—is of the same blood and bone as the ancient wares of "Thebes. * * * But the tiles are very important. * * * "They are in general character similar to, although not so carefully "made as, the oriental tiles known as Persian, which adorn the old "mosques of Egypt, Syria, Turkey, and Persia. * * * The "colours used upon them are rich copper green, a golden brown "and dark and turquoise blue. * * * The antiquary, the "artist, and the manufacturer will do well to study these wares. "As in their silk and woollen fabrics, their metal work and other "manufactures, an inherent feeling for, and a power of producing "harmony in the distribution of colour and in surface decoration, "exists among the Orientals, which we should study to imitate, if "not to copy. It is not for Europeans to establish schools of art, in "a country the productions of whose remote districts are a school "of art in themselves, far more capable of teaching than of being

* The master potters known to me by name are Jumu, son of Osman the Potter, Karachi; Mahommed Azim, the Pathan, Karachi; Messrs. Nur, Mahommed, and Khamil, Hyderabad; Ruttu Wuleed Minghu, Hyderabad; and Peranu, son of Jumu, Tatta. Mr. Kipling sends me the name of Mohammed Hashim at Multan.

" taught." It is a rare pleasure to the eye to see in the polished corner of a native room one of these large turquoise-blue sweetmeat jars on a fine Kirman rug of minium red ground, splashed with dark blue and yellow. But the sight of wonder is, when travelling over the plains of Persia or India, suddenly to come upon an encaustic tiled mosque. It is coloured all over in yellow, green, and blue, and other hues ; and as a distant view of it is caught at sunrise, its stately domes and glittering minarets seem made of purest gold, like glass, enamelled in azure and green, a fairy-like apparition of inexpressible grace and the most enchanting splendour.

But if it is a terrible error to darken by the force and teaching of English Schools of Art, and the competition of Government Jails, and other state institutions in India, the light of tradition by which the native artists work in gold and silver and jewelry, in textiles, and pottery, it is equally an abuse of the lessons to be taught by such an exhibition of the master hand crafts of India as the collection of the Prince's presents affords, for the manufacturers of Paris and Lyons, and Birmingham and Manchester, and Vienna, to set to work to copy or imitate them. Of late years the shop windows of Regent Street and Oxford Street have been filled with electrotype reproductions of Burmese, Cashmere, Lucknow, Cutch, and Madras silver and gold work, along with Manchester, Coventry, and Paisley imitations of Indian chintzes, *kincobs*, and shawls. This is simply to deprave and debase English manufactures and English taste. No people have a truer feeling for art than Englishmen and women of all classes, or purer elements of a national decorative style and methods: and the right and fruitful use of looking at superb examples of Indian jewelry, tapestries, and pottery is not to make literal counterfeits of them, but to kindle the sense of wonder and imagination in us to nobler achievements in our own indigenous industrial arts. Art at second hand is already art in its decay; while nothing serves to maintain its perennial spontaneity and purity like the inspiration which comes of the contemplation of the best examples of foreign art. European manufacturers should visit the Indian Collection at the Paris Exhibition, not to slavishly plagiarise, but to receive a stimulating and elevating influence from the light and life of a traditional art still fresh and pure, as at its first dawning two or three thousand years ago on the banks of the Indus and the Ganges.

THE KNOP AND FLOWER PATTERN.

We have traced the gradual development of Aryan civilisation, from the Punjab and Valley of Cashmere westward to the British Isles, and the rise of Semitic civilisation in the lands which the to-and-fro trade of Europe and Asia had to cross about half way down the *litus Arianum*, in consequence of the interposed obstruction of the Isthmus of Suez and Africa, and the peninsula of Arabia. We have seen how this line of coast and overland intercommunication between the East and West Aryans was subject to be constantly interrupted by the incursions of Scyths, Mongols, and other Turkish hordes, whom we may associate with "the Shut up nations" of the Alexander legends; and how it still went on even after the Ottoman Turks had established their dominion between the Tigris and Euphrates, the Nile, and the Danube, and was only discarded on the discovery of the ocean way round Africa to the East. This is but 400 years ago, and for 4,000 years before, the road between India and the Mediterranean countries had been through the Tigris and Euphrates valley, and the valley of the Nile. From the time of Alexander, and through all the time of the Ptolemies and Seleucidæ, and under the Roman Empire, until Egypt, Syria, and Persia were conquered by the Saracens, the intercourse between India and Greece through Persia, Assyria, Syria, and Egypt was unbroken and intimate. Although interrupted at first, it again revived under the Saracens, and, under the Ottoman Turks, was only finally suspended after the Portuguese had obtained possession of Ormuz. Even then, the Armenians continued, as they have to the present day, the local intercourse between India and Assyria and Western Asia; going to India and purchasing goods on the spot, and returning with them to Bandar Abbas, Ispahan, Baghdad, Mosul, and Tabriz.

This is quite sufficient to account for the remarkable affinity between Assyrian and Indian decorative art, and the frequent identity of their ornamental details; which, in turn, prove the continuity and intimacy of the commercial intercourse between India and Assyria. Of course the general affinity between Indian and Assyrian art may be in part due to the common Turanian substratum of Indian and Assyrian civilisation. When the Aryas made their way through Cashmere into the Punjab, they found the plains of the Upper Indus already occupied by a Turanian race, which they indeed easily conquered, but which, as the caste regulations of the Code of Menu prove, was far superior to themselves in industrial civilisation. These aborigines already worked in metal and stone, and wove woollen, cotton and linen stuffs, knew how to dye them, and to embellish their buildings with paintings: the descriptions of Megasthenes prove that, even at its highest development, Hindu civilisation was more Turanian than Aryan: and the pre-Aryan Turanian civilisation of India must have been

similar to the pre-Semitic Turanian civilisation of Babylonia, Chaldæa, and Assyria, and probably preceded it. All that is monstrous in the decorative forms of Indian and Assyrian art, all that is obscene in Indian symbolism, is probably derived from common Turanian sources, anterior to direct commercial intercourse between India and Assyria. But, when we find highly artificial and complicated Indian decorative designs identical in form and detail with Assyrian, we feel sure that the one must have been copied from the other, and indeed there can be no doubt that the Indian ornamental designs, applied to and derived directly from sculpture, which are identical with Assyrian, were copied from the monuments of Assyria; Egyptian, of course, from Egypt. We cannot trust alone to the allusions, references, or even descriptions of the Bible, Homer, and the Ramayana, to identify the art manufactures of India with those of Assyria, Phœnicia, and Egypt; by themselves they indicate generic likeness only; and their specific identity can only be demonstrated by a comparison of the actual remains of ancient art, and of the carved and painted representations on contemporary monuments. But when this identity has been proved from the monuments and other remains, the Bible, Homer, the Ramayana and Mahabharata, and Pliny, are invaluable in that they enable us to complete our information on the sure and certain foundation so laid; and, to the picture thus composed of the early civilisation of the world, we are justified in giving colour and motion from the strictly traditional, still living civilisation of India; while it is reasonable to suppose that the Indian was the earliest of these primitive civilisations.

The Bible, and Homer, and the Greek poets generally, are full of idyllic scenes from the life of ancient Greece, Syria, and Egypt, which are still the commonplaces of the daily life of the natives of India, who have lived apart from the corruptions of European civilisation. There are many passages also directly illustrating the handicrafts of the ancients. In Proverbs xxx, we read the praise attributed to Solomon, about B.C. 1015–975, of a good wife: "She "seeketh wool and flax, and worketh willingly with her hands. "She is like the merchant's ships, she bringeth her food from afar. "She riseth up while it is yet night, and giveth meat (bread) to her "household * * * She considereth a field and buyeth it; with "the fruit of her hands she planteth a vineyard. * * * She "perceiveth that her merchandise is good: her candle goeth not "out by night. She layeth her hand to the spindle, and her "hands hold the distaff. * * * She is not afraid of the snow "for her household; for all her household are clothed with "scarlet. She maketh herself coverings of tapestry: her cloth-"ing is silk and purple. Her husband is known in the gates, "when he sitteth among the elders of the land. She maketh "fine linen and selleth it; and delivereth girdles unto the mer-"chant. Strength and honour are her clothing; and she shall "rejoice in time to come. * * * Her children rise up and call "her blessed; her husband also, and he praiseth her. * * * "Favour is deceitful and beauty vain, but a woman that feareth

" the Lord, she shall be praised. Give her of the fruit of her " hands, and let her own work praise her in the gates." And in Exodus xxxvi, v. 30–35, about B.C. 1500, we read of Bezaleel and Aholiab the master craftsmen of the first Temple:—" And Moses " said unto the children of Israel, See the Lord hath called by " name Bezaleel, the son of Uri, the son of Hur, of the tribe of " Judah; and He hath filled him with the spirit of God in wis- " dom, in understanding, and knowledge, and in all manner of " workmanship; and to devise curious works, to work in gold, " and in silver, and in brass, and in the cutting of stones to set " them (jewelry), and in carving of wood to make any manner " of cunning work. And He hath put in his heart that he may " teach, both he and Aholiab, the son of Ahisamach, of the tribe " of Dan. Them hath He filled with wisdom of heart to work all " manner of work of the engraver, and of the cunning workman, " and of the embroiderer, in blue and in purple, and in scarlet, " and in fine linen, and of the weaver, even of them that do any " work, and of those that devise cunning work." These passages, and there are numbers of the same description in Homer, and Aristophanes, are sufficient to prove the close affinity of the primitive Hindu civilisation of India, in the simplicity and beauty of its life, in the profound religiousness of its animating spirit, and in the identity of many of its industrial arts, with the civilisations of Assyria, Phœnicia, and Egypt, and with that of Greece in the heroic age at least; while even in the midst of the growing corruptions of imperial Rome, we find that Augustus Cæsar brought up the females of his family and household on the antique model, and wore no clothing but such as had been made by their hands.

The researches of Mr. Fergusson have shewn that stone architecture in India does not begin before the end of the third century B.C. He has also drawn attention to the similarity in ground plan and, in some instances in elevation, of Indian temples to Assyrian and Egyptian. He observes that if the description given by Josephus of the temple at Jerusalem, as rebuilt by Herod, be read with a plan such as that of Tinnevelly, it is impossible to escape the conviction that these coincidences are not wholly accidental. In their grandeur and splendour of detail and in the labour bestowed on them for labour's sake, the resemblance between the temples of Egypt and Madras is most remarkable. Not less startling are the traces of Assyrian art in these temples, and Mr. Fergusson expresses the opinion that, if we are to trust to tradition or to mythology or to ethnological coincidences, it is rather to the valley of the Tigris and Euphrates than to the banks of the Nile that we should look for the *incunabula* of what are found in Southern India. The jewelry of Madras is distinctly founded on its temple ornaments. A Madras silver incense stick holder, exhibited by Mr. FitzGerald formed of an antelope hunted by a dog along a conventional flower stalk, and taken from the sculptures common on all Madras temples, is identical with some of the representations of hunting scenes on the Assyrian monuments given in Rawlinson's

"Ancient Monarchies." In this it is clear that India is the copyist. The knop and flower, or cone and flower, pattern is represented, with local variations, on early Indian monuments in the same form and general style as on the marbles of Assyria, and in the Bharhut sculptures, at least, the lotus is repeatedly represented in the identical half conventional form in which we find it, *en silhouette*, in the Hieroglyphic paintings of Egypt. Here again India is obviously the copyist.

It is quite possible, however, that some of the very forms in India which can be proved to be copied from Assyrian temples and palaces may have originally been carried into Egypt and Assyria on Indian cotton or woollen fabrics and on jewelry. The knop and flower pattern commonly found on Scinde pottery [Plate I., fig. 7], is identical with the knop and flower pattern on the Koyunjik palace doorway [Plate IV., fig. 1], figured in Rawlinson's "Ancient Monarchies," vol. i., p. 417. In the same volume, at page 493, is a circular breast ornament [Plate IV. fig. 2], on a royal robe, from a sculpture at Nimrud. Here the cone does not alternate with a lotus flower, but with the fan-like head of the *Hom*. Nor is the cone a lotus bud, but a larger representation of the fruit of the *Hom*. In a common form of Persian plate [Plate I., fig. 6], which may (chiefly because of the circular shape of the two objects) be compared with this breast ornament, the cone is developed into a form conical in shape, but *Hom*-like in detail, and the flower is metamorphosed into a strange Chinese style of scroll. That it is the knop and flower pattern is proved beyond dispute by the curved line which unites the base of the knop with the base of the flower, and which is found surviving in ornaments derived from this pattern when almost every other trace of it has disappeared. A modification, in point, of this pattern is repeated on the inner border of the plate. A very beautiful variation of the pattern is one of the commonest seen on Scinde tiles, in which the knop has become the regular Saracenic cone, and the flower not the head of the *Hom*, or lotus, but a full blown Iris [Plate I., fig. 5]. On Delhi and Cashmere shawl borders [Plate I., fig. 2] the *Hom*-head-like flower often looks very like the "Shell" on Renaissance and mouldings. On these shawl borders the knop and flower are often also combined, the knop becoming the cone or Cypress-like trunk of a tree, the branches of which fan out like the fronds of the *Hom*. [Plate III., fig. 6]. In some Indian and Persian carpets the knop or cone throws out graceful *Hom* fronds, one on either side, from the ends of which hangs a large flower, presenting the alternation of a branching cone and flower. Every other branching cone is also, as it were, upside down, so that we get a winding floriated line running in and out between each cone and flower. When the cone is large it is filled in with floral detail, as in Cashmere shawls, the last bright inflorescence of the original hard Egyptian and Assyrian knop and flower pattern. A few engravings are added from Owen Jones' "Grammar of Ornament," to shew the modification of this pattern in Egyptian, Greek, Italian, and Renaissance art. Chapters have been written by puzzle-headed *savans* to account for these scrolls and for the cone, but surely their origin is so

plain, that he who runs may read. The Greek "honeysuckle and palmette" scroll is simply the knop and flower, as are the Renaissance "shell," and the "tongue and dart," and "egg and tongue" patterns in classical mouldings. Long ago Mr. Fergusson pointed out [Illustrated Handbook of Architecture, Vol. I., p. 7] that in the "*lat*" at Allahabad, the necking immediately below the capital represents with considerable purity the honeysuckle ornament of the Assyrians, which the Greeks borrowed from them with the Ionic order. Its form [Plate v. fig. 6] is derived originally from the Date, *Hour*, but it really represents, conventionally, a flowering Lotus, as the Bharhut sculptures [Plate v. figs. 4 and 5] enable us to determine. The "reel and bead" pattern running along the lower border of the necking represent the lotus stalks. One Chinese modification of the knop and flower pattern is very significant. The flower is here [Plate IV., fig. 11] a pomegranate, and the cones have become green pomegranate buds; but, instead of being in their original Assyrian places, they are attached to the edge of the vermilion corolla, one on each side, while their old places are filled by a panel formed by the curved lines, which should have joined the flower to the bud, running down between the flowers in parallel lines to the lower edge of the patterned border.

The Assyrian breast ornament figured by Canon Rawlinson proves that the fan-like pattern throwing off its long stalked cones, arranged alternately round the border with the larger cones, is the head of the *Hom*, represented in the centre, and a multitude of representations of the *Hom* in Rawlinson's "Ancient Monarchies" and "Herodotus," and on old Saracenic and Sicilian brocades prove that it is the Date tree, and that the long stalked cones flourished out from it, and the large cones which alternate with it round the border of this breast ornament, are great clusters of dates, highly conventionalised. These cones are sometimes replaced by Pomegranates, and, strange to say, the Tree of Life represented as modern Yarkand rugs, is always a Pomegranite tree. The cone figured by Canon Rawlinson, vol. ii., p. 212, as a Pine-apple [Plate III., fig. 3] is clearly a bunch of dates bursting from its spathe. This cone appears [Plate III., fig. 4] on late Italian and early Renaissance brocades, crowned, with flames rising from the crown, and alternating with oak leaves, from which long-stalked acorns are represented issuing forth like the cones from the trunk and head of the Date *Hom*.

The original *Hom* was the Sanskrit *Soma, Sarcostemma brevistigma*, a leafless (the rudimentary leaves are scarcely visible) scandent Asclepiad, with its flowers collected in umbels, fan-like *en silhouette*, a native of the southern slopes of the Cashmere Valley and Hindu Kush, the fermented juice of which was the first intoxicant of the Aryan race. It is still used as an intoxicant by the Brahmins, and the succulent stalks are chewed by weary wayfarers to allay their thirst. It is admirably represented on the Assyrian sculptures; and in Rawlinson's "Ancient Monarchies," vol. ii., p. 236, it is figured [Plate II., figs. 1, 2] twined very characteristically, although highly conventionally, about the date tree forming the "Tree of Life," *Asherah*, or "Grove," sacred to Asshur, the

Supreme Deity of the Assyrians, the Lord and Giver of Life. Canon Rawlinson notices the resemblance of the *Hom* head to the Greek Honeysuckle ornament, and adds, "I suspect that the so-"called 'flower' [*i.e.*, Honeysuckle,] was in reality a representation "of the head of a palm tree." Possibly the date was substituted for the original *Hom* in Assyria, in consequence of the Aryas finding that they could not naturalise the true *Hom* plant, or because the date yields a more abundant intoxicating juice. Its fruit, also, would become the staff of life in the region of the Euphrates valley, and hence would naturally be consecrated to Asshur, as the "Tree of Life." Later, the Vine took its place in Asia Minor and Greece. As the "Tree of Life" is associated in the Bible with the Serpent and the Tree of Knowledge of Good and Evil, which brought death into the world, so, it is very suggestive to see in Rawlinson, vol. ii., p. 167, the Date *Hom* arranged alternately with a serpent-encircled Cypress [Plate III., fig. 1] in the scene in which an Assyrian King is feasting his Queen in a bower (*gloriette*) of the royal gardens.

In Egypt the knop and flower were represented by the date palm and its fruit, by the lotus and its bud, and by the lotus flower and a bunch of grapes, or the lotus flower and a bull's head; sometimes the flower by the papyrus head. In Owen Jones' "Grammar of Ornament," Plate 4, fig. 6, the ornament, which looks like a lotus-headed form of some sort [Plate II., fig. 5], is proved to be a date, by the rippled mass of red and green hanging down one side of it, representing the ripe fructification of the date burst from its spathe. That the ripple is taken from the zig-zag of the branching date stalks, any botanist will see. On the monuments, the Phœnician Venus Chiun [Amos v. 26] is shewn, presenting snakes to Remphan or Moloch, the Author of Death, and Lotus flowers to Khem the Author of Life, on whose altar we find the Tree of Life represented by a Loto-Papyro-Palm-headed plant form, with a Cyprus form, evidently derived from the Lotus bud, on either side, and guarded by the *cabiri*, which suggested to the Hebrews the Cherubim, placed at the East of the Garden of Eden, to keep the way of the Tree of Life, and to the Greeks, "the dog" Cerberus, that guarded the entrance to Hades. The Tree of Life is represented throughout Greek and Roman and Italian and Renaissance art. It is still represented on the commonest Spanish and Portuguese earthenware by a green tree that looks exactly like a Noah's ark tree; but it invariably springs from two curved horns, which betray the secret. In India the knop and flower change like the transformations of a dream. Indeed, in Hindu art imagination is let loose as in a dream. In the Amravati and Bharhut sculptures the transformations go on under your eye, and reveal the whole mystery. The cone is generally the lotus bud, and the elephant is never represented in carved stone without it in its trunk. Sometimes the cone of budding plantain fruit takes its place. The flower is generally the lotus represented *en silhouette*, like a fan, or full-faced; and sometimes the fan-like form of the Date *Hom* is given to the Peacock's tail, and to the many-headed Cobra; and not only these

Cobra heads, but the water-lily is represented in true honeysuckle form [Plate V., figs. 4, 5]. The cone is also represented by the mango and jack. In short, anything full of the glory of life becomes the symbol of life. The peacock's tail, the glorious lotus flower, the mighty jack, the nutritious and uncloying plantain, the luscious, golden mango, the thyrsus-like clusters of the flowers of the *cadumba*, and the Sacred Fig, throwing down rootlets from every branch, which take root again and spring up in forests round the parent stem; all are natural and obvious symbols of life. The melon-shaped finial on the pagodas of Indian temples is probably derived from the unripe fruit of *Nymphæa rubra*. We have, however, to be on our watch for the vagaries of Hindu imagination. The entire leaf of the jack, *Artocarpus integrifolia*, is represented so swollen and bursting with life as to pass into the divided leaf of the Bread Fruit Tree, *Artocarpus incisa*. Again, we find the catkins of the jack, from which the long pendant ornaments worn by elephants in front of their ears are modelled, represented hanging out of the flowers, from the fruit of the lotus, from the branches of the Sacred Fig, and about the *lingam*, and *trisul*, which I believe to be the combined *lingam* and *yoni*. In the earlier sculptures a lotus plant is represented issuing from the proboscis of an elephant, the stalk running along in an undulating line, between the curves of which the flower is seen alternately in full face and *en silhouette*, in the most superb style of conventional art. In the Bharhut sculptures [Plate V.], a lotus springs in the same way from an elephant, and its flowers alternate with the jack and mango; and, between each lotus "flower," and whatever fruit takes the place of the "knop" or cone, we have representations of the Buddhistic fables or *jatakas*; while the fruitful mystic lotus is represented pouring down all manner of good things, and jewelry in countless forms. In one place a woman from a tree, reminding one of the woman in the Egyptian Tree of Life, is pouring water into a man's hands, from a veritable tea pot. In the Amravati and Takht-i-bhai sculptures, the Lotus stalk is looped up in festoons by dwarfs, as we see similar festoons, in Roman architectural remains, held up by genii. It may be that the Takht-i-bhai sculptures were influenced by Greek examples, or were executed under Greek direction; but really the intercourse with Assyria will account for a good deal that looks like Greek inspiration in India, just as it is now evident that the ornamental details of Greek sculpture also were derived from Assyria. The "knotted rope" pattern may have been taken from the knots in the stalks of the cones issuing from the stem and head of the Date *Hom*, and the wedge pattern, alternate dark and light, from the conventional representation of the leaf scars on the stem of the Date *Hom*. The tree-like figures given in Plate II., compiled from Owen Jones, and Mr. Fergusson, and Mrs. Jameson, all recall the *Asherah* or "Grove" of the Assyrians, particularly the mediæval representation of the Cross, as the tree with twelve leaves for the healing of the nations.

Sometimes on Persian rugs the entire tree is represented, but generally it would be past all recognition but for smaller repre-

sentations of it within the larger. In Yarkand carpets, however, it is seen filling the whole centre of the carpet, stark and stiff as if cut out in metal. In Persian art, and in Indian art derived from Persian, the tree becomes a beautiful flowering plant, or simple sprig of flowers; but in Hindu art it remains in its hard architectural form, as seen in temple lamps, and the models in brass and copper of the Sacred Fig as the Tree of Life. On an embroidered Pindari bag it is represented in two forms [Plate I., figs. 1, 3, 4], one like a notched Noah's Ark tree, and the other branched like the temple candelabra. In this bag the cone is represented with the trees.

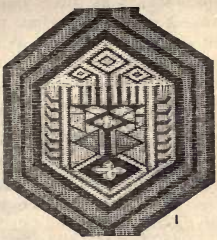
Neither is it difficult to conjecture how these religious symbols of the first worship of the Aryan race, afterwards darkened and polluted in Turanian India, and Egypt, and Assyria, by a monstrous and obscene symbolism, came to be universally adopted in the art ornament of the East. It originated in the embroidered hangings and veils worked by women for the temples, which they embroidered with the representation of the symbol of the deity worshiped.

The women "who wove hangings for the grove," or *Asherah*, are alluded to in 2 Kings xxiii. 7. They probably embroidered on cut patterns, and worked the larger patterns in *appliqué* into their work; and they cut the patterns by folding the cloth double, so as by one undulating or zig-zag cut to get a two sided symmetrical pattern. Nor is this entirely conjecture. This method is everywhere practised among the artistic peasantry of Europe. I have a number of such patterns, which I once saw a French peasant boy cutting out in paper, to wile away the time. It happens that they are all of trees, some cypresses, and others trees with the cross introduced in the most strange conventional manner about them, trees, in fact, of life and death. The method of cutting out patterns in this way tends to perpetuate a symmetrical and rectangular representation of ornament. The Noah's Ark-like tree, on the Pindari bag [Plate I., fig. 3], is certainly derived from a bit of paper or cloth folded and cut crossways and then notched. Be this as it may, the knop and flower pattern, and the Tree of Life pattern pervade all decorative art, and by direct derivation from the Assyrian lotus and lotus bud, and *Asherah* and cone, but no longer as symbols. This absence of symbolism is the weakness of modern European decoration, as indeed it was of Grecian; and yet what conventional form is more beautiful than the French *Fleur-de-lis*, more beautiful and worshipful than the Tudor Rose, or than such heraldic symbols as the cross crosslet; and the most natural decoration for wall papers, curtains, and book lining papers, would be, for people who could afford it, to use family arms, alone, or in combination with national symbols, and conventionalised representations of national flowers or animals. But no symbols can approach in beauty of form and meaning to the knop and flower, and the *Hom* of Assyria, and, purified of all local taint of Asshur, Ashtoreth or Astarte, they belong to all the Aryan races in the old world and the new.

The history of mankind is in its direct impulses the history of surplus populations in search of food; but wherever men have been able to rest, and to found civil and political organisations, they have raised up testimony to the truth that man shall not live by bread alone. We find it figured everywhere in Oriental art, and we cannot take up a talisman of Egypt, an engraved gem of Assyria, a Syrian silk, an alabastron of Persian perfumes, or a Persian illuminated MS. or carpet, a Cashmere shawl, an Indian jewel or *kincob*, any of the great store of these splendid and precious stuffs, and arms, and vessels of wrought gold and silver, presented to the Prince of Wales, on which we do not find the acknowledgment of the divine author and finisher of every perfect work; in symbols taken from the most majestic of trees and the loveliest and most graceful of flowers, and which express more simply, directly, and fully, than can any form of words, the wisdom and beneficence of the Creator, and the gladness and praise of men. The Portuguese, the first discoverers of India, always carried the Cross at the mast-head of their ships as a sign of the higher aims of their enterprise, and of all human intercourse and effort. They erred grievously in seeking to give too dogmatic an effect to their aspirations, and the Inquisition of Goa is the blackest spot in the history of the connexion of Europe with the East. But not the less valuable is the recognition of the true position and destiny of men in the world,—that only in responsibilities incurred, and duties discharged by each for another, is there any hope either for individuals or for States, and that to weary of and shrink from them are the first signs of the sinking fortunes of an Empire.

GEORGE BIRDWOOD.

2



1

5

3

4

6

7

8

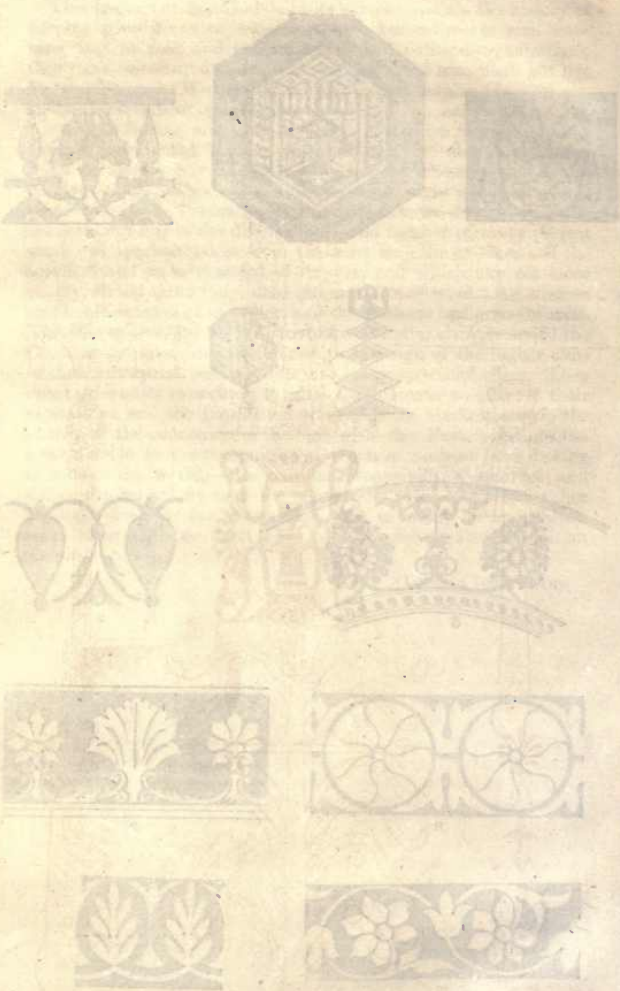
9

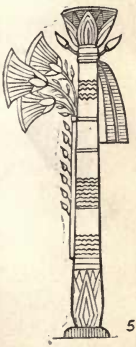
10

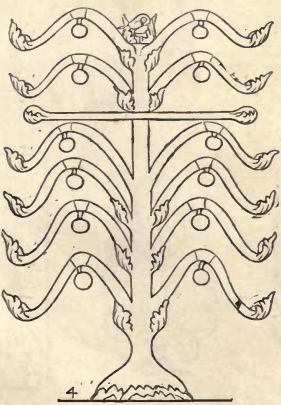
11

1, 3, 4, from a Pindari bag.
2, from a Delhi shawl.
5 & 7, from Scinde pottery.

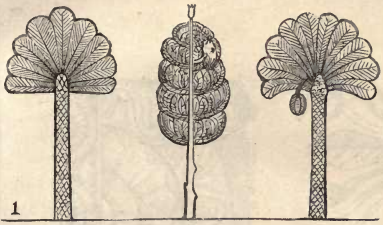
6, from a Persian plate.
8 to 11, from Owen Jones' "Grammar of Ornament."







1 & 2, from Rawlinson's "Ancient Monarchies."
3 & 8, from Fergusson's "Tree and Serpent Worship."
5, 6, & 7, from Owen Jones.
4, from Jameson's "History of our Lord."
9, from the Vase of Nicosthenes.

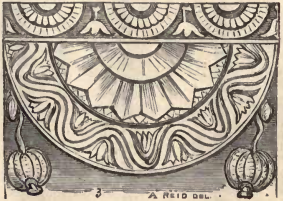


1 & 3, from Rawlinson's "Ancient Monarchies." 5, from Wilkinson's "Ancient Egyptians."
2, from an old Saracenic brocade. 6 & 7, from Baden Powell's "Punjab Manufactures."
4, from Owen Jones.

1 & 2. From Rev. Hinton's "Ancient Moorfields." 3. From Wilkinson's "Ancient Egyptians."
4. From an old Persian brocade. 5 & 6. From Indian Jewels "Indian Industries."
7. From Owen Jones.

1

2



3

4

6

5

1 to 5, from the Bharhut sculptures. 6, from the *lat.* at Allahabad ; *see* Fergusson's "Illustrated Handbook of Architecture."

PLATE V.






APPENDIX A.

STATISTICS OF THE MORAL AND MATERIAL PROGRESS OF INDIA.

No. 1.—POPULATION OF INDIA, according to the latest Returns and Estimates:

Under British Administration - - -	191,018,412
Native States - - - - -	48,233,978
French and Portuguese Possessions - -	679,172
Total population - -	239,931,562
In round numbers - -	240,000,000

No. 2.—ADULT MALE POPULATION OF BRITISH INDIA, CLASSIFIED ACCORDING TO OCCUPATION:

Engaged in Agriculture - - - -	37,393,055
„ Industrial occupations - -	8,749,270
„ Commerce - - - -	3,425,738
„ Government Service and Professions	2,401,630
„ Domestic occupations - -	4,136,430
Labourers, nature of labour unspecified - -	8,137,082
Independent, non-productive, and unspecified -	2,283,089
	66,526,294
Deduct, women and children included in the above classes - - - -	4,523,833
Total adult male population -	62,002,461

No. 3.—Gross Amount of the several Sources for each of the 13 under-

Official Years ended		Land Revenue.	Tributes, Subsidies, and Contributions from Native States.	Excise and Forest.	Income Licence, and Assessed Taxes.	Customs.
		£	£	£	£	£
30 April	1864	20,308,423	715,990	2,364,713	[1] 1,483,622	2,384,061
	1865	20,087,728	681,144	2,575,793	[1] 1,281,817	2,296,929
	1866	20,473,897	709,632	2,612,556	[2] 692,241	2,279,857
31 March	1867 (11 months)	19,136,449	629,245	2,431,129	[2] 22,127	2,030,864
	1868	19,986,640	689,286	2,570,019	[3] 653,848	2,578,632
	1869	19,926,171	687,363	2,691,078	[1] 508,700	2,692,755
	1870	21,088,019	765,126	2,725,245	[1] 1,110,224	2,429,185
	1871	20,622,823	719,421	2,827,907	[1] 2,072,025	2,610,789
	1872	20,520,337	744,036	2,871,033	[1] 825,241	2,575,990
	1873	21,348,669	741,465	2,884,125	[1] 580,139	2,653,820
	1874	21,037,912	768,544	2,909,768	[1] 20,136	2,628,495
	1875	21,296,703	724,972	2,929,424	[1] 2,747	2,678,479
	1876	21,503,742	726,188	3,165,760	[1] 510	2,721,389
Total for the 13 years		267,332,603	9,302,412	35,568,550	9,253,377	32,561,815

Official Years ended		Telegraph.	Law (Fees, Fines, &c.).	Education.	Public Works (Irrigation and Railway Receipts and Gain by Exchange thereon).	Interest on Loans and Advances.
		£	£	£	£	£
30 April	1864	91,762	631,798	[4] —	461,785	72,277
	1865	99,699	683,320	[4] —	588,673	247,624
	1866	190,463	790,529	57,538	917,465	216,824
31 March	1867 (11 months)	219,472	815,219	66,658	538,139	233,513
	1868	241,947	951,314	73,845	557,840	211,975
	1869	265,568	1,172,093	73,711	553,305	224,523
	1870	247,042	1,089,503	74,889	957,714	336,376
	1871	243,010	1,017,869	61,610	915,579	341,001
	1872	228,368	[4] 373,160	[4] —	830,040	363,212
	1873	249,802	392,686	—	792,280	506,779
	1874	250,638	359,146	—	989,489	451,452
	1875	286,479	321,798	—	1,047,735	543,319
	1876	309,040	315,992	—	1,276,526	561,189
Total for the 13 years		2,922,690	8,914,436	408,251	10,376,570	4,310,064

[1] Assessed taxes. [2] Income tax. [3] Licence tax.
[4] Reduced by transfer to Provincial Services.

of REVENUE and RECEIPT in INDIA and in ENGLAND, mentioned Official Years.

Salt.	Opium.	Stamps.	Mint.	Post Office.	OFFICIAL YEARS ended	
£	£	£	£	£		
5,035,696	6,831,999	1,735,216	369,759	459,882	1864	30 April.
5,523,584	7,361,405	1,972,098	377,859	362,333	1865	
5,342,149	8,518,264	1,994,632	494,354	406,466	1866	
5,345,910	6,803,413	1,803,773	239,991	496,439	1867 (11 months)	31 March
5,726,093	8,923,568	2,186,269	120,252	659,679	1868	
5,588,240	8,453,365	2,306,971	193,788	707,792	1869	
5,888,707	7,953,098	2,379,316	157,214	711,698	1870	
6,106,280	8,045,459	2,510,316	33,400	805,235	1871	
5,966,595	9,253,859	2,476,333	96,150	820,894	1872	
6,165,630	8,684,691	2,608,512	54,261	[4] 580,312	1873	
6,150,662	8,324,879	2,699,936	66,544	688,198	1874	
6,227,301	8,556,629	2,758,042	159,021	739,400	1875	
6,244,415	8,471,425	2,835,368	110,489	763,597	1876	
75,311,262	106,182,054	30,266,782	2,473,082	8,201,925	Total for the 13 years.	

Receipts in aid of Superannuation Allowances (Subscriptions to Funds, &c.).	Marine (Pilot Dues, Sale of Stores, &c.).	Army (Sale of Stores, Stoppages, Discharge, Purchase Money, &c.).	Miscellaneous.	TOTAL.	OFFICIAL YEARS ended	
£	£	£	£	£		
[5] —	307,715	747,431	615,903	44,613,032	1864	30 April.
[5] —	308,095	735,567	469,820	45,652,897	1865	
[5] —	198,890	728,340	2,311,123	48,935,220	1866	
[5] —	228,543	737,368	344,181	42,122,433	1867 (11 months)	31 March
[5] —	455,090	759,112	1,189,003	48,534,412	1868	
[5] —	688,084	1,133,024	1,396,160	49,262,691	1869	
[5] —	329,953	1,082,605	1,575,167	50,901,081	1870	
[5] —	333,145	962,148	1,185,669	51,413,686	1871	
682,282	[6] 196,894	944,420	341,371	50,110,215	1872	
587,078	[6] 208,943	906,810	263,417	50,219,489	1873	
697,853	[6] 236,323	1,011,039	357,239	49,598,253	1874	
698,642	[6] 298,525	988,888	312,027	50,570,171	1875	
749,166	[6] 227,887	1,045,612	281,768	51,310,063	1876	
3,415,021	4,018,087	11,782,314	10,642,848	633,243,643	Total for the 13 years.	

[5] Included in Miscellaneous. [6] Including Inland Navigation.

No. 4.—Amount of the several Heads of Expenditure, in India

Official Years ended		Refunds, Charges of Collection of Revenue, Assignments under Treaties, &c.	[1] Interest on Debt and on Obligations.	Administration, including Minor Departments.	Law and Justice.	Marine.
		£	£	£	£	£
30 April	1864	9,379,396	4,971,414	977,362	2,120,636	632,788
	1865	9,050,376	4,988,029	971,702	2,264,424	641,389
	1866	8,527,985	5,128,242	1,240,831	2,426,206	633,367
31 March	1867 (11 months)	7,637,527	4,889,301	1,271,284	2,397,788	770,630
	1868	8,957,464	5,732,757	1,317,537	2,544,349	1,095,174
	1869	9,249,766	5,654,984	1,396,905	2,845,447	1,140,630
	1870	9,230,823	5,609,687	1,429,151	2,903,454	1,223,154
	1871	9,266,931	5,840,145	1,573,068	2,996,190	759,770
	1872	8,518,887	5,966,299	1,779,134	2,273,813	[3] 574,100
	1873	8,887,264	5,857,458	1,893,395	2,222,175	[3] 555,366
	1874	9,155,350	5,789,821	1,898,617	2,266,179	[3] 528,333
	1875	9,510,766	5,412,055	1,927,121	2,298,180	[3] 590,046
	1876	9,483,279	5,563,968	2,006,764	2,336,477	[3] 627,702
Total for the 13 years		116,855,814	71,404,160	19,691,871	31,892,518	9,842,449

Official Years ended		Civil Furlough, and Absentee Allowances.	Provincial Services.	Famine Relief.	Miscellaneous.	Army.	Public Works.
		£	£	£	£	£	£
30 April	1864	72,092	[2] 2,815,688	—	556,370	14,510,247	4,920,643
	1865	68,020	[2] 2,963,931	—	516,449	15,772,236	4,613,046
	1866	77,587	[3] 3,247,585	—	1,333,055	16,748,220	4,784,625
31 March	1867 (11 months)	79,305	[3] 3,239,402	—	796,294	15,825,791	5,025,444
	1868	99,159	[3] 3,476,821	—	732,214	16,103,296	5,622,855
	1869	122,461	[3] 3,711,274	—	527,314	16,269,581	6,272,334
	1870	157,918	[3] 3,678,527	—	712,609	16,329,739	5,034,565
	1871	175,068	[3] 3,498,683	—	743,648	16,074,800	3,945,967
	1872	173,029	4,848,205	—	368,865	15,678,112	[4] 2,459,780
	1873	156,059	5,223,190	—	275,726	15,503,612	2,525,241
	1874	258,464	5,069,972	3,864,673	109,697	15,228,429	2,357,941
	1875	216,704	5,148,744	2,237,860	120,896	15,375,159	2,504,230
	1876	229,199	5,153,652	508,554	186,761	15,308,460	2,824,482
Total for the 13 years		1,885,065	52,075,674	6,611,087	6,979,897	204,727,682	52,891,153

[1] Including dividends to proprietors of East India Stock, to 1874–5 inclusive.
[3] Including Inland Navigation.
[3] Extraordinary works are public works that the Government have decided may be
[4] These figures are composed of the charges for Police, Education, Stationery, and Works, were transferred to the Local Governments in 1871–2, to be defrayed from the

and in ENGLAND, for each of the 13 under-mentioned Official Years.

Ecclesiastical.	Medical.	Political Agencies.	Superannuation, Retired, and Compassionate Allowances.	Loss by Exchange on Remittances to Home Treasury.	Official Years ended	
£	£	£	£	£		
149,437	128,422	229,148	935,239	11,640	1864 - -	30 April
148,858	133,203	286,247	1,275,812	42,700	1865 - -	
154,886	274,889	251,592	906,499	84,662	1866 - -	
144,360	261,801	267,098	766,472	165,223	1867 (11 months)	31 March
158,707	352,316	277,354	1,156,019	117,248	1868 - -	
163,590	380,361	349,855	[2] 1,746,369	193,867	1869 - -	
161,083	443,074	405,897	1,332,515	203,441	1870 - -	
153,544	523,486	352,966	1,450,763	472,973	1871 - -	
155,911	[4] 174,807	315,100	1,453,471	395,964	1872 - -	
152,330	176,262	390,816	1,576,253	765,109	1873 - -	
159,527	180,596	366,209	1,522,969	986,530	1874 - -	
161,724	181,579	404,223	1,779,970	897,878	1875 - -	
158,058	181,928	429,535	1,939,305	1,429,658	1876 - -	
2,022,015	3,392,724	4,325,840	17,841,656	5,766,893	Total for the 13 years.	

Railways (ordinary), including Guaranteed Interest.	[3] Extraordinary Works.			Total.	Official Years ended	
	Irrigation.	State Railways.	Bombay Special Fund.			
£	£	£	£	£		
2,124,163	—	—	—	44,534,685	1864 - -	30 April
2,109,996	—	—	—	45,846,418	1865 - -	
343,121	—	—	—	46,169,152	1866 - -	
1,102,204	—	—	—	44,639,924	1867 (11 months)	31 March
1,798,837	219,255	594	382,613	50,144,569	1868 - -	
2,011,983	468,849	552,398	349,366	53,407,334	1869 - -	
1,856,776	2,007,361	190,870	401,383	53,382,026	1870 - -	
2,102,694	718,438	449,372	—	51,098,506	1871 - -	
1,850,561	983,854	644,620	—	48,614,512	1872 - -	
2,293,561	770,920	1,413,649	—	50,638,386	1873 - -	
1,662,614	1,198,682	2,354,625	—	54,959,228	1874 - -	
1,483,839	1,235,391	3,014,180	—	54,500,545	1875 - -	
1,273,336	1,105,445	3,165,184	—	53,911,747	1876 - -	
22,013,685	8,708,195	11,785,492	1,133,362	651,847,032	Total for the 13 years.	

[2] Including 327,600 in adjustment of charge for 1867-8.
[4] Reduced by transfer to Provincial Services.
carried out by loans, if necessary.
Printing, which, with certain charges previously entered under Medical or Public allotments thereafter made for Provincial Services

No. 5.—Value of the Principal and other Articles of Private by Sea, from Foreign Countries, in each of the

Principal Articles Imported.	Official Years ended 30 April			Official Years			
	1864.	1865.	1866.	1867. (11 mos.)	1868.	1869.	1870.
	£	£	£	£	£	£	£
Apparel	452,684	534,895	510,352	387,451	439,417	497,891	451,230
Arms, Ammunition, and Military Stores.	386,036	354,749	480,057	82,918	91,470	84,644	96,852
Books, Paper, & Stationery	410,782	352,318	375,381	288,140	436,978	447,851	414,912
Coal, Coke, &c.	332,627	357,612	466,805	512,123	853,984	715,863	544,477
Cotton Twist and Yarn	1,529,001	2,191,440	1,961,144	2,572,700	2,698,350	2,779,934	2,715,370
,, Manufactures	10,416,662	11,035,885	11,849,214	12,524,106	14,999,917	16,072,551	13,555,846
Drugs and Medicines	120,999	73,777	72,039	[1] 143,025	[1] 254,565	[1] 222,715	[1] 210,167
Dyes	152,817	55,635	64,271	113,601	124,756	94,298	111,499
Fruits and Vegetables	333,942	366,376	392,446	[2] 223,276	[2] 364,928	[2] 227,202	[2] 345,453
Glass	249,146	311,450	306,508	177,724	230,289	271,100	308,086
Gums and Resins	63,153	67,781	63,971	46,828	73,083	78,647	99,817
Hardware, Cutlery, and Plated Ware.	[3]	[3]	[3]	[3]	[3]	[3]	[3]
Horses	42,971	33,019	37,071	51,869	28,895	52,232	77,206
Ivory	[4]	[4]	115,455	103,120	121,309	130,965	118,022
Jewelry & Precious Stones	443,591	482,292	952,996	333,068	244,686	231,952	264,808
Liquors: Malt	712,393	471,917	528,485	552,024	435,770	381,773	413,520
Spirits	412,632	324,852	416,592	388,223	455,174	549,819	564,378
Wines, Liqueurs, &c.	429,339	402,393	474,544	436,153	476,406	574,040	548,329
Machinery and Millwork	585,516	554,156	586,182	601,740	1,057,861	793,183	555,742
Metals: Iron	—	—	—	784,888	1,461,300	1,425,655	1,188,086
Steel	—	—	—	63,880	83,371	111,937	166,377
Copper and Brass	—	—	—	1,269,776	1,939,665	1,743,097	1,753,634
Spelter	—	—	—	85,848	204,259	192,805	137,045
Tin	—	—	—	226,899	99,856	146,075	156,377
Lead	—	—	—	55,738	22,060	41,773	44,944
Quicksilver	—	—	—	37,317	22,382	41,825	15,510
Unenumerated	—	—	—	63,081	106,263	136,484	110,426
Total	3,368,652	3,755,932	3,043,234	[5]2,587,427	[5]3,939,156	[5]3,839,651	[5]3,572,399
Oils	[4]	[4]	24,594	53,276	58,221	45,370	12,391
Paints and Colours	96,345	134,843	96,802	76,203	170,013	175,643	160,962
Perfumery	46,083	40,278	32,117	26,280	33,138	30,524	34,580
Porcelain & Earthenware	79,721	93,256	91,368	62,488	71,152	84,002	93,351
Provisions	248,877	238,760	286,567	296,142	351,452	337,610	331,186
Railway Plant and Rolling Stock.	1,267,240	685,632	1,435,929	2,091,417	2,464,966	1,591,813	1,217,334
Salt	315,632	341,867	265,289	356,114	677,473	729,270	750,095
Silk, Raw	385,507	329,315	511,239	423,866	566,583	730,934	901,117
Silk, Manufactures of	456,781	443,949	357,380	415,070	423,598	486,518	466,593
Spices	195,954	197,183	187,189	278,435	425,307	286,756	297,381
Sugar, &c.	422,138	318,627	563,305	541,817	536,884	653,611	715,553
Tea	148,824	125,744	186,310	134,527	253,364	201,987	166,522
Tobacco	[7] 105,783	[7] 104,167	[7] 70,909	[7] 89,660	[7] 89,865	[7] 101,119	[7] 77,282
Umbrellas	63,081	60,714	65,895	64,106	122,085	111,531	87,174
Wood, and Manufactures of	54,465	78,676	132,641	60,997	59,056	92,645	59,045
Wool, Raw	[4]	[4]	106,863	69,575	41,141	47,974	54,018
Wool, Manufactures of	611,570	867,831	583,132	576,481	601,957	764,173	596,713
All other Articles	2,197,646	2,363,352	1,955,152	1,272,771	1,391,111	1,413,583	1,890,233
Total Value of Merchandise	27,145,590	28,150,923	29,599,228	29,014,741	35,664,320	35,931,374	32,879,643
Treasure	22,962,581	21,363,352	26,557,301	13,229,533	11,775,374	14,366,588	13,954,807
Total Merchandise and Treasure	50,108,171	49,514,275	56,156,529	42,244,274	47,439,694	50,297,962	46,834,450

[1] Including chemicals. [2] Including dried fruits, &c. [3] Included in metals. [5] Excluding hardware, cutlery, and plated ware.

MERCHANDISE, and of the TREASURE, IMPORTED into BRITISH INDIA 13 under-mentioned Official Years.

ended 31 March						PRINCIPAL ARTICLES IMPORTED.
1871.	1872.	1873.	1874.	1875.	1876.	
£	£	£	£	£	£	
433,098	499,571	601,258	578,220	620,456	615,961	Apparel.
74,297	93,759	100,850	76,320	84,273	76,318	Arms, Ammunition, and Military Stores.
423,233	413,959	428,003	475,027	472,968	448,619	Books, Paper, & Stationery.
467,096	514,794	497,942	740,026	680,463	665,535	Coal, Coke, &c.
3,357,393	2,424,522	2,628,296	2,628,959	3,157,780	2,794,769	Cotton Twist and Yarn.
15,687,476	15,058,811	14,605,953	15,155,666	16,263,560	16,450,212	„ Manufactures.
[1] 239,984	223,114	304,061	267,538	291,696	217,919	Drugs and Medicines.
143,359	119,096	186,336	139,929	158,146	143,439	Dyes.
[2] 371,014	[2] 265,825	[2] 263,889	[2] 279,775	[2] 234,682	70,597	Fruits and Vegetables.
276,855	240,421	297,236	333,334	318,881	349,931	Glass.
94,154	98,712	98,250	141,394	131,849	91,429	Gums and Resins.
[3]	[3]	[3]	[3]	[3]	475,338	Hardware, Cutlery, and Plated Ware.
68,845	85,935	61,008	70,759	67,360	74,388	Horses.
117,092	144,407	145,658	185,969	123,048	231,089	Ivory.
176,937	210,423	221,321	171,438	190,993	176,831	Jewelry & Precious Stones.
311,686	305,319	363,406	337,916	349,844	268,107	Liquors: Malt.
385,900	560,485	553,884	488,597	553,833	603,476	Spirits.
433,337	495,783	511,864	476,196	476,610	520,544	Wines, Liqueurs, &c.
447,543	405,835	517,316	1,002,347	1,185,943	1,391,667	Machinery and Millwork.
799,895	841,490	752,576	795,516	1,247,348	1,424,598	Iron - - }
114,837	87,126	78,638	56,680	95,988	88,996	Steel - -
1,361,759	1,036,674	578,788	513,023	863,873	1,256,024	Copper and Brass
122,205	123,791	121,917	49,523	47,464	82,651	Spelter - -
141,742	116,209	80,064	147,765	140,001	169,236	Tin - - } Metals.
53,344	57,397	63,782	38,294	50,943	63,099	Lead - -
14,715	35,330	16,425	14,303	16,120	107,510	Quicksilver -
105,694	92,758	110,431	123,403	145,385	41,355	Unenumerated -
[5]2,713,591	[5]2,390,775	[5] 1,802,621	[5] 1,738,507	[5] 2,607,122	[6] 3,233,469	Total - }
59,880	59,544	51,629	67,449	109,954	70,213	Oils.
103,505	128,395	148,482	118,003	136,822	202,951	Paints and Colours.
34,932	31,032	40,286	33,189	36,725	42,546	Perfumery.
74,820	68,641	90,343	98,533	115,448	99,154	Porcelain & Earthenware.
305,320	349,224	351,474	372,867	363,727	[7] 713,839	Provisions.
1,466,068	516,996	327,466	439,339	538,962	599,770	Railway Plant and Rolling Stock.
715,892	913,915	828,703	835,354	755,771	600,934	Salt.
895,563	651,595	659,480	786,914	872,927	694,889	Silk, Raw.
425,527	480,948	560,643	608,374	710,478	708,896	Silk, Manufactures of.
222,170	201,744	216,381	150,562	179,126	359,988	Spices.
555,801	709,779	440,146	558,978	516,564	895,927	Sugar, &c.
114,055	202,513	246,576	182,859	169,982	247,596	Tea.
75,432	88,493	70,382	71,407	70,274	76,479	Tobacco.
86,771	124,130	134,819	90,246	119,362	196,400	Umbrellas.
57,607	95,161	56,943	53,406	72,360	81,111	Wood, and Manufactures of.
46,323	42,342	52,705	38,562	42,772	45,501	Wool, Raw.
583,220	514,194	719,530	668,911	557,586	869,760	Wool, Manufactures of.
1,302,970	1,080,584	1,287,836	1,165,627	1,306,965	1,707,127	All other Articles.
33,348,246	30,810,776	30,473,069	31,628,497	34,645,262	37,112,668	Total Value of Merchandise.
5,444,823	11,573,813	4,556,585	5,792,534	8,141,047	5,300,722	Treasure.
38,793,069	42,384,589	35,029,654	37,421,031	42,786,309	42,413,390	TOTAL MERCHANDISE AND TREASURE.

[4] Included in "All other articles." [5] Including hardware, cutlery, and plated ware
[7] Including articles used in consumption of tobacco.

No. 6.—VALUE of the PRINCIPAL and OTHER ARTICLES of INDIAN PRODUCE and from BRITISH INDIA, by SEA, to FOREIGN COUNTRIES, on PRIVATE

PRINCIPAL ARTICLES EXPORTED.	OFFICIAL YEARS ended 30 April			OFFICIAL YEARS			
	1864.	1865.	1866.	1867. (11 mths.)	1868.	1869.	1870.
	£	£	£	£	£	£	£
Coir, and Manufactures of	87,133	67,533	97,905	87,493	66,790	140,460	151,401
Coffee	657,672	801,908	785,102	394,321	761,345	1,121,032	870,189
Cotton, Raw	35,864,795	37,573,637	35,587,389	16,478,064	20,092,570	20,140,825	19,079,138
Cotton Twist and Yarn	1,167,577	1,043,960	1,732,133	95,516	175,775	128,183	122,619
Cotton Manufactures				1,062,344	1,259,683	1,211,638	1,176,138
Drugs and Medicines	104,505	101,043	90,998	31,501	36,190	47,573	48,415
Dyes: Indigo	1,849,946	1,940,495	1,818,280	1,798,599	1,823,226	2,893,823	3,178,945
Other (except Lac)			140,582	129,483	99,046	187,038	164,640
Grain and Pulse: Rice (including Paddy)	4,325,377	5,956,408	5,247,918	3,295,093	3,647,008	4,210,925	3,020,276
Wheat				76,896	101,308	98,760	32,924
Other				281,801	212,909	265,023	168,254
Gums and Resins	34,821	31,517	46,456	54,191	125,786	207,355	210,407
Hemp & Manufactures of [1]	96,736	123,901	73,375	21,675	16,472	33,461	61,372
Hides and Skins	897,575	725,236	609,803	659,342	988,282	1,252,808	1,691,330
Horns	65,173	31,805	34,917	39,550	48,624	55,651	74,654
Ivory, and Manufactures of	80,398	77,217	92,402	85,008	64,575	122,520	108,289
Jewelry & Precious Stones	113,596	49,164	117,140	76,820	95,652	40,139	37,779
Jute, Raw	1,618,244	1,410,702	1,083,522	750,669	1,309,537	1,891,899	1,984,495
Jute, Manufactures of				443,854	291,555	187,542	205,923
Lac (Dye, Shell, &c.)	242,021	297,394	305,375	195,869	189,954	227,176	253,800
Oils	422,175	217,730	133,859	97,681	213,991	380,081	325,030
Opium	10,756,093	9,911,804	11,122,745	10,431,703	12,330,799	10,695,654	11,693,330
Saltpetre	722,204	542,389	605,350	297,713	256,301	310,758	394,870
Seeds	2,032,832	1,912,433	1,750,197	1,787,996	2,160,572	1,994,888	2,308,942
Silk, Raw	954,649	1,165,901	745,352	811,798	1,553,229	1,362,381	1,561,512
Silk, Manufactures of	115,465	106,612	88,829	95,147	97,344	145,784	142,062
Spices	161,509	145,165	163,008	121,089	160,847	185,482	174,635
Sugar, &c.	716,857	765,110	361,262	152,778	128,703	410,974	327,325
Tea	271,229	301,622	309,899	378,126	729,714	983,757	1,080,515
Tobacco	46,224	81,868	[2] 52,722	[2] 54,293	[2] 64,187	[2] 47,358	[2] 60,980
Wood, & Manufactures of	220,749	436,756	369,523	135,381	128,178	286,645	156,123
Wool, Raw	995,048	1,151,002	871,514	742,716	611,590	641,803	472,614
Wool, Manufactures of	275,891	254,497	220,115	259,185	329,313	304,357	255,395
All other Articles	729,455	802,710	763,350	436,304	703,946	839,322	877,955
Total Merchandise	65,625,449	68,027,016	65,491,123	41,859,994	50,874,001	53,062,165	52,471,376
Viz., Indian Produce and Manufacture	63,379,885	65,790,445	62,684,452	40,773,959	49,596,664	51,676,232	50,679,545
Foreign Merchandise	2,245,564	2,236,571	2,806,671	1,086,035	1,277,337	1,385,933	1,791,831
Treasure	1,270,435	1,444,775	[4]2,165,352	1,950,435	1,025,336	776,082	1,025,386
TOTAL MERCHANDISE AND TREASURE	66,895,884	69,471,791	67,656,475	43,810,429	51,899,337	53,838,247	53,496,762

[1] Excluding cordage.

[2] Excluding gunjah and churras, which are classed with drugs.

[4] Including treasure exported

MANUFACTURE, of FOREIGN MERCHANDISE, and of TREASURE, EXPORTED ACCOUNT, in each of the 13 under-mentioned Official Years.

ended 31 March 1871.	1872.	1873.	1874.	1875.	1876.	PRINCIPAL ARTICLES EXPORTED.
£	£	£	£	£	£	
92,751	121,385	169,982	164,232	137,647	[1] 101,708	Coir, and Manufactures of.
809,701	1,380,410	1,146,219	1,499,496	1,307,919	1,633,395	Coffee.
19,460,899	21,272,430	14,02[illegible],458	13,212,241	15,257,342	13,280,959	Cotton, Raw.
159,247	121,469	137,236	181,173	293,812	324,376	Cotton Twist and Yarn.
1,250,766	1,070,214	1,279,626	1,414,197	1,426,539	1,380,577	Cotton Manufactures.
43,703	75,434	80,361	68,897	70,267	74,843	Drugs and Medicines.
3,192,503	3,705,475	3,426,824	3,555,300	2,576,302	2,875,065	Dyes: Indigo.
212,158	251,394	265,505	169,282	214,248	140,517	Other (except Lac).
4,203,851	4,499,161	5,761,030	5,549,798	4,765,354	5,311,095	Grain and Pulse: Rice (including Paddy).
103,833	235,645	167,690	827,606	491,451	906,331	Wheat.
161,271	130,942	144,915	170,942	231,384	203,711	Other.
171,602	147,336	240,169	146,940	179,015	194,010	Gums and Resins.
74,630	55,973	70,626	70,617	78,587	[1] 63,390	Hemp, & Manufacture of.[2]
2,020,819	2,525,925	2,921,910	2,618,358	2,677,767	2,944,933	Hides and skins.
61,038	65,323	94,694	62,398	79,012	83,165	Horns.
77,647	65,577	108,030	129,854	93,770	116,921	Ivory, & Manufactures of.
42,653	53,999	54,161	50,822	90,825	80,888	Jewelry & Precious Stones.
2,577,553	4,117,308	4,142,548	3,436,015	3,246,882	2,805,340	Jute, Raw.
344,752	184,859	189,541	201,609	238,640	489,181	Jute, Manufactures of.
190,825	278,945	203,680	257,653	254,011	755,747	Lac (Dye, Shell, &c.)
177,222	416,186	335,600	262,899	354,259	426,290	Oils.
10,783,863	13,365,228	11,426,280	11,341,857	11,956,972	11,148,426	Opium.
440,554	397,251	536,314	464,974	501,468	348,956	Saltpetre.
3,522,305	2,728,788	1,508,339	2,361,451	3,235,950	5,462,388	Seeds.
1,351,346	1,130,709	1,305,487	1,225,599	796,676	452,370	Silk, Raw.
160,425	164,525	199,804	239,865	255,487	260,811	Silk, Manufactures of.
201,385	304,712	171,376	238,317	197,891	380,552	Spices.
295,076	347,635	542,395	281,743	394,384	377,387	Sugar, &c.
1,139,703	1,482,186	1,590,926	1,754,618	1,963,550	2,183,881	Tea.
[3] 63,074	79,662	136,484	167,148	232,954	171,508	Tobacco.
256,494	326,030	386,019	415,904	366,399	471,627	Wood, & Manufactures of
670,647	806,698	861,626	966,832	965,919	1,109,740	Wool, Raw.
148,764	198,106	353,585	229,502	211,516	217,202	Wool, Manufactures of.
865,777	974,623	1,253,735	1,222,687	1,258,082	1,280,835	All other Articles.
55,331,825	63,185,848	55,236,295	54,960,786	56,312,261	58,058,125	Total Merchandise
53,551,681	61,697,226	53,449,183	53,114,427	54,501,091	56,224,964	Viz. { Indian Produce and Manufacture.
1,780,144	1,488,622	1,787,112	1,846,359	1,811,170	1,833,161	} Foreign Merchandise.
1,587,180	1,421,173	1,273,979	1,879,071	1,592,721	2,115,144	Treasure.
56,919,005	64,607,021	56,510,274	56,839,857	57,904,982	60,173,269	{ TOTAL MERCHANDISE AND TREASURE.

[3] Including articles used in the consumption of tobacco. on account of Government.

Railways.

No. 7.—Length of Line open on Railways in India on 31 Dec. in each of the 13 under-mentioned years.

Year.	Miles.	Year.	Miles.
1864	2,962	1871	5,077
1865	3,369	1872	5,382
1866	3,567	1873	5,700
1867	3,935	1874	6,190
1868	4,015	1875	6,497
1869	4,285	1876	6,948
1870	4,832		

Post Office.

No. 8.—Principal Statistics of the Post Office of British India for each of the 14 under-mentioned Official Years.

Official Years ended		Number of Post Offices.	Number of Letters, Newspapers, Parcels, and Packets received for Delivery.
30 April	1864	1,091	52,462,093
	1865	1,191	56,968,948
	1866	1,538	60,913,136
	1867 (11 months)	1,738	59,849,215
31 March	1868	2,205	69,154,847
	1869	2,589	75,987,617
	1870	2,629	84,534,578
	1871	2,736	85,689,823
	1872	2,884	89,561,685
	1873	3,006	93,157,314
	1874	3,178	109,235,503
	1875	3,403	116,119,231
	1876	3,661	119,470,921
	1877	3,852	122,541,753

No. 9.—Statistics relating to Government Telegraphs in India and Ceylon for each of the 12 under-mentioned Official Years.

Official Years ended 31 March	Length of Telegraph		No. of Signal Offices open at end of each Year.
	Wire.	Line.	
	Miles.	Miles.	
1864	12,975	12,161	155
1865	14,587	13,635	174
1866	15,399	13,767	172
1867 (11 months) [1]	15,866	13,784	159
1868	18,067	13,887	178
1869	20,597 [2]	14,423	193
1870	21,378 [2]	14,275	198
1871	22,834 [2]	14,016	205
1872	28,893 [2]	15,336	199
1873 [3]	30,681 [2]	15,705	203
1874	32,556	15,980	225
1875	33,798	16,649	225

[1] Information is wanting to complete the statement for this year. The figures for the Ceylon Telegraph are not included in 1866-7.

[2] Excluding the Ceylon wires.

[3] For 1872-3 and the following years the statements of receipts and expenditure are taken from the Finance Accounts.

No. 10.—Number of Coolie Emigrants embarked from Calcutta, Madras, Bombay, and French Ports in India, to various destinations, during each of the 13 under-mentioned Official Years.

Official Years ended	From Calcutta									From Madras						From Bombay		From French Ports				Total Number of Emigrants.
	To British Colonies.				To French Colonies.			To Dutch Colonies.		To British Colonies.			To French Colonies.			To British Colonies.		To French Colonies.				
	Mauritius.	Natal.	British Guiana.	British West Indies.	Réunion.	French Guiana.	French West Indies.	Surinam.	Total.	Mauritius.	Natal.	British Guiana.	Réunion.	French West Indies.	Total.	Mauritius.	Total.	Réunion.	French Guiana.	French West Indies.	Total.	
30 April 1864	1,822	—	2,643	1,433	291	—	—	—	6,189	3,020	1,021	—	—	330	4,371	706	706	—	—	—	—	11,266
1865	6,743	401	3,189	1,450	1,627	—	—	—	13,360	2,513	1,578	—	1,110	—	5,201	1,351	1,351	994	277	571	1,842	21,754
1866	15,115	—	2,842	2,006	—	—	—	—	19,963	3,310	1,320	—	226	—	4,856	1,068	1,068	895	392	415	1,702	27,589
31 March 1867 (11 months)	478	—	4,509	5,188	—	—	—	—	10,175	3,071	534	—	—	—	3,605	—	—	1,791	748	5,028	7,567	21,347
1868	313	—	3,001	1,840	—	—	—	—	5,154	—	—	—	—	—	—	—	—	—	489	1,971	2,460	7,614
1869	1,237	—	4,941	4,023	—	—	—	—	10,201	358	—	—	—	—	358	—	—	—	—	2,817	2,817	13,376
1870	1,499	—	6,685	3,359	—	—	—	—	12,043	1,288	—	—	—	—	1,288	—	—	—	—	1,417	1,417	14,748
1871	1,937	—	3,199	4,075	—	—	—	—	9,211	1,336	—	—	—	—	1,336	—	—	—	—	1,881	1,881	12,428
1872	3,207	—	2,125	2,899	—	—	—	—	8,231	1,114	—	—	—	—	1,114	—	—	—	—	1,689	1,689	11,034
1873	5,262	—	6,087	5,412	—	—	—	410	17,171	1,554	—	—	—	—	1,554	—	—	—	—	1,312	1,312	20,037
1874	5,387	—	8,497	3,944	—	1,427	1,791	3,523	24,569	2,338	—	231	—	—	2,569	—	—	783	350	972	2,105	29,243
1875	4,914	6,025	3,942	4,140	—	—	1,209	—	20,230	1,886	—	—	—	—	1,886	—	—	1,213	751	1,245	3,209	25,325
1876	739	393	3,849	2,420	—	—	1,850	—	9,251	294	—	—	—	—	294	—	—	1,047	427	470	1,944	11,489
Total for the 13 years	48,653	6,819	55,459	42,689	1,918	1,427	4,850	3,933	165,748	22,082	4,453	231	1,336	330	28,432	3,125	3,125	6,723	3,434	19,788	29,945	227,250

EDUCATION.

No. 11.—RESULT of EXAMINATIONS at the UNIVERSITIES * in INDIA, for ENTRANCE, DEGREES, &c. in each of the 14 undermentioned Official Years.

YEAR.	ENTRANCE.		FIRST ARTS EXAMINATION.		B.A.		HONOURS IN ARTS AND M.A.		LAW.		MEDICINE.		CIVIL ENGINEERING.	
	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.
CALCUTTA UNIVERSITY.														
1863-4	1,307	690	272	149	66	30	8	3	23	20	69	33	—	—
1864-5	1,396	702	321	151	82	45	15	11	24	22	57	35	10	5
1865-6	1,500	510	446	202	122	79	18	16	39	24	66	35	5	2
1866-7	1,350	638	426	131	141	60	39	22	53	36	66	35	9	—
1867-8	1,507	814	388	188	212	99	25	15	82	54	64	21	6	6
1868-9	1,734	892	423	196	174	77	29	18	130	71	86	50	3	2
1869-70	1,730	817	520	225	210	98	32	24	113	92	68	52	8	5
1870-1	1,905	1,099	540	233	212	84	39	35	111	65	91	68	9	3
1871-2	1,902	767	507	204	232	00	32	24	158	63	117	59	13	2
1872-3	2,144	938	560	220	242	126	30	20	130	152	130	56	16	8
1873-4	2,544	848	539	305	212	192	57	32	268	125	168	75	21	3
1874-5	2,354	966	533	193	217	90	38	18	171	40	209	51	24	2
1875-6	2,373	838	575	182	281	73	38	24	87	55	245	92	20	10
1876-7	2,425	1,355	756	344	287	144	49	31	85	63	287	90	21	8
MADRAS UNIVERSITY.														
1863-4	390	143	82	23	21	11	—	—	10	2	—	—	6	1
1864-5	565	223	167	50	29	11	—	—	3	2	—	—	5	4
1865-6	555	229	214	76	8	6	—	—	2	2	—	—	—	—
1866-7	895	306	250	116	18	13	—	—	10	7	—	—	—	—
1867-8	1,069	338	350	117	24	14	—	—	14	10	1	1	—	—
1868-9	1,320	324	443	154	53	40	5	1	31	16	2	2	3	1
1869-70	1,200	401	531	220	59	34	5	5	88	15	—	—	2	—
1870-1	1,358	424	268	96	65	34	—	—	4	2	1	1	4	2
1871-2	1,419	492	205	97	131	65	1	1	9	6	—	—	2	—
1872-3	1,530	611	240	76	81	29	1	1	8	5	2	2	—	—
1873-4	1,704	626	285	125	88	50	1	1	26	13	4	4	4	1
1874-5	1,911	784	342	183	85	55	1	1	16	9	3	2	2	2
1875-6	2,164	662	401	187	107	67	2	1	18	8	3	3	5	3
BOMBAY UNIVERSITY.														
1863-4	291	112	20	15	6	3	5	2	—	—	21	9	—	—
1864-5	241	109	22	16	15	8	2	2	—	—	9	7	—	—
1865-6	282	111	79	41	20	12	9	6	2	2	11	10	—	—
1866-7	440	93	59	21	59	25	6	3	2	2	4	2	3	2
1867-8	539	163	69	21	40	24	12	6	6	3	9	3	7	—
1868-9	640	250	85	40	33	7	12	4	6	3	9	5	10	8
1869-70	839	142	105	34	52	20	7	2	17	6	11	5	12	7
1870-1	901	142	136	44	61	13	4	2	14	13	16	7	21	10
1871-2	876	227	134	32	58	14	5	1	2	—	28	15	31	14
1872-3	909	378	99	24	56	22	6	5	6	1	28	19	29	19
1873-4	1,025	335	148	48	62	25	9	3	7	3	38	21	36	23
1874-5	1,115	262	213	74	69	30	9	2	11	2	51	25	39	17
1875-6	1,269	434	193	69	88	18	6	4	11	5	66	47	36	30
1876-7	1,154	203	176	29	92	40	4	2	16	3	60	30	35	29

* The Universities of Calcutta, Bombay, and Madras were incorporated in 1857 by Acts of the Government of India, Nos. II., XXII., and XXVII. All are based on the model of the University of London, without rigorous uniformity of details being insisted on.

HENRY WATERFIELD, Secretary,
Statistics and Commerce Department.

India Office,
21 March 1878.

Appendix B.

Chinchona cultivation in India.

The introduction of Chinchona cultivation into India was undertaken with the object of ensuring a cheap and unfailing supply of the febrifuge for the use of the millions who annually suffer from fever.

Fever is by far the most prolific cause of death in India, carrying off very many more than all other diseases and accidents put together. The total number of deaths from fever in India is upwards of a million and a half annually. At least half these deaths will eventually be prevented by putting some cheap form of the Chinchona alkaloids into every druggist's shop in the country at one rupee per ounce; and thus multitudes will be saved from death or grievous suffering.

The successful introduction of Chinchona cultivation into India has been a task of considerable difficulty in all its stages. It was not only necessary to transplant a genus of plants from one side of the world to the other, it was also an essential element of success to convert wild into cultivated plants. This involved a close study of the climate, soil, and general physical aspects of each region where the valuable species grow in their native forests; a comparison of these circumstances with those prevailing in the East Indies, the discovery of the best species, and also of the species best adapted to secure good results in their new homes, the study of all the requirements of the plants under cultivation, without any guide, as the Chinchona had never before been cultivated; and finally, the solution of numerous very complicated questions relating to the best and cheapest form in which the febrifuge can be provided for general use.

The task was difficult and complicated. Mr. Markham undertook it in 1859, and all arrangements connected with the collection of plants and seeds in South America, and their conveyance to India, have been made by him, and carried out under his superintendence. His original plan was to depute collectors to the different regions of the Andes where the various species flourish, to have the collections made simultaneously, and to convey them direct across the Pacific to India in a special steamer. But only a portion of his scheme obtained sanction, and no steamer was provided. He was, however, determined that all the species should be secured eventually, and that the work should be complete, even if it extended over many years. This has been the case. It has taken many years to do what might have been done in one or two, and the expense has been quadrupled. Yet the whole work is now at last complete.

In 1859 Mr. Markham was only able to organise three expeditions; one, under his own command, to obtain plants and seeds of the Calisayas and other species from Caravaya, in Southern Peru, yielding the yellow barks of commerce; a second, under Mr. Pritchett, to collect species in the forests of Central Peru yielding the grey barks of commerce; and a third, under that eminent botanist Richard Spruce, to collect plants and seeds of the *Chinchona succirubra* in the forests of Ecuador, yielding the red bark.

In 1860 the whole of this work was done, and done thoroughly, so far as the difficult and dangerous part of it in the Andean forests, and the conveyance of the plants to sea ports on the coast of the Pacific, were concerned; but the failure to furnish the means of direct conveyance to India led to disasters which were inevitable. The plants had to be conveyed across the Isthmus of Panama, then to England, then across Egypt, and down the Red

Sea to India. The first instalment from Southern Peru all died on the passage, or after reaching India; but the seeds forwarded in the following year germinated, and thus a stock of *C. Calisaya* trees was secured. Subsequently more seeds from Bolivia, collected by Mr. Ledger, were received, and the plants raised from them have proved to be an exceedingly valuable variety, which has received the name of *Ledgeriana*. The second instalment of plants, consisting of those yielding grey bark, was equally unfortunate, but the precaution had also been taken of obtaining seeds from which a stock of plants yielding grey barks was established in India. The third instalment, coming at a cooler season for passing down the Red Sea, was more fortunate. It consisted of plants of *C. succirubra*, yielding red bark, nearly all of which arrived safely. Thus by 1862 the arrangements made by Mr. Markham as regards the above species were crowned with complete success; but the work of introducing all the best species was still far from finished. It remained to obtain the valuable species from Ecuador, yielding the crown barks, and also the renowned species of Columbia.

Accordingly Mr. Markham obtained sanction for the dispatch of a collector to Cuenca and Loxa in southern Ecuador to obtain seeds of the *C. officinalis*, the original species of Linnæus (afterwards called *C. condaminea*) from the bark of which the Countess of Chinchon was cured. For this service he selected Mr. Robert Cross, an experienced gardener, who had already acquired experience under Mr. Spruce, with instructions to obtain a supply of seeds of the best Loxa species yielding crown bark. Mr. Cross reached Ecuador in 1862, made a good collection in spite of extraordinary difficulties, and the seeds arrived safely in India and Ceylon, and germinated freely. Mr. Howard, the well-known quinine manufacturer, also presented a fine plant of *C. officinalis* (von *Uritusinga*) from which a large stock has been obtained. Thus the introduction of the crown bark species was secured.

Mr. Markham's next care was to obtain and introduce plants of a valuable species called *C. pitayensis*, which grows on the slopes of the central cordillera of Colombia, near Popayan. For this work he again secured the services of Mr. Cross, who set out in 1863 and made a good collection of seeds, but, owing to damage suffered in their transit, they did not germinate. After some delay Mr. Markham obtained sanction for a second attempt, and in 1868 Mr. Cross again set out for Colombia, this time with more fortunate results, for the seeds of *C. pitayensis* collected by him near Popayan arrived safely, and germinated freely in India.

Meanwhile the destruction of *C. pitayensis* in its native forests led the collectors to seek for other trees in more distant regions, and a new bark began to appear in the market, of great value, known as the *Calisayade Santa Fé*. Mr. Markham resolved that this species should also be introduced into India. The service was one of special difficulty and danger, for the trees are only found on the eastern cordillera of Colombia, near the sources of the Cagnetá. He again intrusted the work to Mr. Cross in 1877, and again his confidence in that intrepid and most able explorer was justified. In March 1878 Mr. Cross arrived at Kew with a good supply of plants of the *Calisaya de Santa Fé*, and also of the *C. cordifolia*, yielding the Carthagena barks of commerce.

Thus at length all the valuable species of febrifuge Chinchona plants, indigenous to South America, have been successfully introduced into India. They are as follows:—

C. Calisaya (yellow barks) Bolivia and Caravaya.
C. nitida, *C. micrantha*, *C. Peruviana* (grey barks) Central Peru.
C. succirubra (red barks) Ecuador.
C. officinalis (crown barks) Ecuador.
C. Pitayensis (Pitayo bark), *Calisaga de Santa Fé.*, *C. cordifolia* (Carthagena barks) Colombia.

The first and most hazardous stage of the enterprise was the collection of the plants and seeds in South America, and their conveyance to India. The

second and equally difficult stage was the cultivation and the discovery of the species best suited for India, as well as the best method of treatment with a view to producing the largest per-centage of febrifuge alkaloids in the barks.

The first step was the selection of the most suitable sites for the plantations, being those having most resemblance to the native habitat of the Chinchona. Mr. Markham proceeded to India in 1860 to perform this duty; and chose a site at Neddivattum, on the northern slopes of the Neilgherry Hills, facing Wynaad, for the plants of *C. succirubra*, the *C. Calisaya* and grey barks; and a site at a greater elevation, under the Dodabetta peak, for the *C. officinalis* plants. He also selected sites for plantations in Coorg and the Pulney Hills, and, on the occasion of a second visit to India in 1866, in Travancore and Wynaad.

The successful conversion of the Chinchona from a wild to a cultivated tree is due to the unrivalled skill and ability of the late Mr. McIvor, superintendent of Chinchona cultivation, in the Madras Presidency. Mr. McIvor propagated the plants with great success, established them in the plantations, discovered the conditions under which they would give the largest yield, and also the method of renewing the bark by the mossing process, which undoubtedly secures an increased per-centage of febrifuge alkaloids. The final conclusions are that the *C. succirubra* species is best adapted for use in India, and for furnishing abundant supplies of a cheap febrifuge; while the *C. officinalis* and the Columbian kinds will be the most valuable barks for the London market, and for securing a remunerative return on the outlay. By 1870 the Neilgherry Chinchona plantations, belonging to the Government, covered 1,200 acres of ground; while private individuals possessed several thriving and paying plantations on the Neilgherries and in Wynaad, 235,747 plants having been distributed up to 1875. In the same year there were over a million Chinchona trees in the Government plantations.

In 1862 a Chinchona plantation was established in British Sikkim, under the superintendence of Dr. Anderson, plants of *C. succirubra* having been obtained from the Neilgherry hills. Other kinds are not likely to flourish in the Sikkim climate, but the *C. succirubra* is well established in the Rungbee plantation. By the year 1875 there were upwards of two million plants of *C. succirubra* at Rungbee, and the propagation can be carried on with ease to any extent.

Thus the second stage of the enterprise, namely the cultivation, was crowned with complete success.

The third and most important measure is the supply of a cheap febrifuge to the people. As soon as it was established that the *C. succirubra* would be the best species for India a very critical point arose. That species yields a very large per-centage of total febrifuge alkaloids, but only a small quantity of quinine. Mr. Markham saw that it was of vital consequence to discover the medicinal value of the other alkaloids, namely chinchonidine, quinidine, and chinchonine; and to ascertain whether they, equally with quinine, possessed the precious febrifuge qualities. He accordingly obtained the appointment of Medical Commissions in 1866, for each of the three Presidencies, to investigate and report upon this question. The result was that chinchonidine (the principal alkaloid in *C. succirubra*) and quinidine were found to be quite equal to quinine, and chinchonine inferior, though still efficacious in larger doses. This was a great point, for it made a cheap febrifuge medicine possible. The extraction of pure quinine is an expensive process, but the production of a medicine containing the total alkaloids in the bark is easy and simple.

This important fact having been established, Mr. Markham next urged the adoption of a measure calculated to secure the final object of the introduction of Chinchona cultivation into India; namely, the preparation of a febrifuge medicine at the Government plantations, which should contain all the alkaloids, and should be saleable at a cheap rate. With this object Mr. Broughton was appointed as quinologist on the Neilgherry Hills in 1866; and in 1873 Mr. Wood received a similar appointment for the Sikkim plantations. Mr. Broughton adopted a method for the manufacture of his medicine which

entailed the use of alcohol, and was, therefore, too expensive. Up to 1873 he had made about 600 lbs. of an amorphous Chinchona alkaloid, but the essential requisite of cheapness was not secured. His method was consequently abandoned. Mr. Wood began his actual manufacturing operations in 1875. His method is the same as that recommended by the learned quinologist of the Hague, Dr. J. E. De Vrij, who calls the resulting product *quinetum*. The powdered bark is first exhausted with cold acidulated water, and the resulting liquor is precipitated by a caustic alkali. Scarcely any fuel is required, and no expensive machinery, merely some wooden tubs and calico filters. There can soon be yielded, by this process, about 140,000 ounces of an efficient Chinchona alkaloid every year, at a cost of less than 1 Rupee per ounce. Quinine, in England, is from eight to nine shillings an ounce, and in India the price is much higher.

Thus the great object of this difficult undertaking is on the eve of being secured; and an inestimable blessing will be conferred upon India; while at the same time the barks rich in quinine will be sold in the London market, and will repay all the outlay with interest. The sum of 40,000*l.* was realised by these sales in 1877 alone. While, on the one hand, Chinchona cultivation will be a most remunerative public work, on the other it will rob the malarious fevers of India of three fourths of their victims, and will to that extent diminish the amount of human misery and suffering.

G. B.

Appendix C.

Monograph on the Wild Silk Industry of India, illustrated by the Contents of the large Glass Case containing Wild Silk Specimens in the India Section.—Dedicated with great respect to P. Cunliffe Owen, Esq., C.B.

It is the Silk produced by the Tasar or Tussore worm, in which the chief interest of the case lies.

I have endeavoured to exhibit this Silk in as full a manner as the space assigned to me would permit, representing it in all states of its manufacture and tinctorial enrichment, showing the recent improvement in manufacture and dyeing of which it is capable, as well as illustrating the Natural History of the Tussore insect in all stages of its developement, by preserved specimens of its several phases, except the larvæ, which it has not been possible to obtain.

Tussore Silk has long been known and used by the natives of India. They have exported it in considerable quantities of late years, but from their imperfect mode of manipulating it in its earlier stages of manufacture, and from the difficulty of dyeing it well, it has made but little way in Europe except for ladies' and children's dresses in an undyed state.

In Bengal and the adjoining provinces from time immemorial the natives have manufactured this silk into cloth called "Tusseh Doot hies," which is worn by Brahmins and other sects of Hindoos.

The Silk is found from the North-west range of the Himalaya south as far as Midnapore, in Bengal, and through the North-east range to Assam, and southward to Chittagong and probably further. It is found also in the Presidencies of Bombay and Madras. It is said to be abundant in Bhagulpore in Bengal. It abounds chiefly in the Eastern districts of Chattisgarh, namely Raipur, Bilaspur, and Sambulpur, in the Chanda district of the Nagpore province, and the Leone district.

The natural colour of the silk is a darkish shade of fawn, much unlike the golden and white colours of the Mulberry-worm silk.

It has much less affinity for dyestuffs, especially for those which grow in India, and it has not until recently been much dyed.

For several years I have been engaged with considerable success in improving the methods of dyeing, and the results are shown in the case, Nos. 10, 11, 12, 20, 40, 41, 42, 52.

Important improvements which I have had effected in the manufacture of Tussore silk are shown in Nos. 8, 9, 18, 19, 21, 51, 53, 54, 55, which will be fully described in their turn.

These improvements in the manufacture and dyeing are most likely to have a very great influence on the cultivation of this silk, and probably also of other wild silks, the demand for which may in a few years be only measured by the quantity which can be produced.

The first specimen under No. 1 in the case is a leaf of a species of Terminalia containing eggs of the Tussore moth, which are said to hatch in from two to four weeks.

The larvæ, when fully grown, are about four inches in length; they have twelve joints or articulations, besides their extremities; their colour is green

resembling the leaves on which they feed; and they are marked with reddish spots and a reddish yellow band running lengthways. They feed on several plants: —

Rhizophora calceolaris. Linn.
Terminalia alata glabra (Assum tree).
Terminalia Catappa (Country Almond tree).
Tectona grandis.
Zizyphus jujuba.
Shorea robusta.
Bombax heptaphyllum.
Careya sphærica.
Pentaptera tomentosa.
Pentaptera glabra.
Ricinus communis (Castor oil plant).
Cassia lanceolata.

In six weeks from the time they are hatched they begin to spin their cocoons, which they most curiously suspend from the branches of the trees by constructing a thick hard cord or filament of silky matter, which is made to grasp the branches, as seen in the specimens No. 3.

As soon as the worm has spun its cocoon it takes the form of chrysalis or pupa (see No. 2), and remains a prisoner in the cocoons for about nine months, or from October until July. At the end of this time the chrysalis takes the form of a moth, and whilst its wings are in an imperfectly developed state it softens one end of the cocoons with an exudation which enables it to separate the filaments of silk and to work its way out of the cocoon. This it effects during the night.

Those shown under No. 4 are cocoons from which the moth has emerged.

No. 5

Are Tussore cocoons from Sambulpur, in the Central Provinces but larger than those under No. 3.

The weight of the ordinary Tussore cocoon with its pupa enclosed and the cord by which it is attached to the branch is about five grammes.

Nos. 6 and 7

Are specimens of Tussore moths known under the following names:—

Antherea Paphia (Linnæus).
Bombyx „ (Hübner).
Saturnia „ (Helfer).
Phalæna Attacus Mylitta (Durmy).
„ Paphia (Roxburgh).
Bombyx Mylitta (Fabricius).
"Bughy" of the native of Burbhoon Hills where the silk (which the same people call "Tusseh") is manufactured.

The male is of a reddish pale brown colour and the female much yellower.

Mr. O'Neil in his report says:—"The moths are particularly revered by the "people engaged in the culture of the worms, the occulili on their wing being "considered as the 'chakra' or mark of Vishnu. These people also pretend "to observe the greatest purity of life during the time they are in the jungles "rearing the worms, and also do not eat flesh, fish, or spices, do not shave or "cut their hair, do not wear washed clothing, nor anoint their bodies with oil, "and do not touch any of whom a relative may have recently died."

Nos. 8 and 9.

Organzine and Tram Tussore of the quality and state of manufacture now used in England for weaving, and a good representation of the present state of its manufacture which gives a size of 255 deniers (15 drams per 1,000 yards). The sizes of the Tussore silk generally used in England run from 152 deniers (9 drams) to 255 deniers (15 drams). This is a coarse size and must of

necessity be unfit to produce such fine textile work as the mulberry silk which is manufactured into Organzine and Tram of 21 deniers and upwards (1¼ drams) and from which are made the finest silk fabrics.

The printed cloths Nos. 21 and 55 are made with Tussore Organzine and Tram of the coarse size of Nos. 8 and 9 and of the same quality.

The want of fineness and quality is owing to the imperfect and unskillful mode of manipulating it from the cocoon upwards in India, and the want of better machinery to prepare it in the grège state.

Nos. 10, 11, and 12.

The same silks dyed in colours and black. Nos. 10 and 12 are dyed entirely with Indian dyestuffs, and are well worthy of notice.

No. 13.

Native reeled Tussore raw silk, undyed. From Bhagulpur.

No. 14.

Another specimen of native-reeled Tussore raw silk, undyed.

No. 15.

The same silk dyed by the natives.

No. 16.

Native reeled Tussore raw silk, undyed. From Bogra.

No. 17.

Native reeled Tussore, from Bengal, undyed.

No. 17*a*.

Tussore raw silk, manufactured from the same species of cocoons as those under No. 3, illustrative of the great improvement of which it is now susceptible.

No. 18.

Organzine Tussore, the same as No. 12, reeled in India, and manufactured in England, 255 deniers (15 drams per 1,000 yards). Placed here to contrast with the next specimens of improved manufacture.

No. 19.

Organzine Tussore, manufactured, etc., under my own instructions and superintendence.

The improvement in quality, fineness, and cleanness, will be seen to be most marked, and that instead of the coarse sizes of Tussore now used, of 152 to 255 deniers (9 to 15 drams), there may be obtained by proper management Organzine and Tram of excellent quality from the same cocoons of 51 deniers (3 drams) and upwards, which can be woven into a great variety of stuffs, for which until now only the mulberry silks have been available.

The attention of all interested in or connected with silk manufacture, cannot be too strongly drawn to this fact, nor can its value be overrated.

There is a most important future in store for the Tussore silk industry, and as great improvements will take place as those which resulted from the introduction of proper machinery and skill many years ago, in the mulberry silk districts of Bengal, when it was found that Bengal silks, in place of being then almost unworkable, could be manufactured in such a way as to bring them into extended use in Europe, so as even to rival French and Italian silks. The cost of making Organzine and Tram from the cocoons with the improved mode is about 15 francs per kilogramme. Mr. Neil, in his report (1875), says: "The contrivances for manufacturing silk are very simple, but improvement is required in the art of manufacturing silk fabrics."

No. 20.

This is the same silk as No. 19, dyed by improved processes with Aniline dyes, to show the delicacy of hue this silk is capable of affording under the altered treatment. There is scarcely any shade or colour, dark or light, which cannot now be dyed on Tussore silk.

No. 21.

In the upper part of the case I have printed upon Tussore silk fabrics, made with Organzine and Tram, Nos. 8 and 9, a series of patterns to show that it is now possible to print on this silk. It is, as far as I am aware, the first time any attempt has been made either in Europe or in the East to print on wild silk cloth of any kind.

So that now printed Tussore silk can be successfully used for wall damasks, curtains, furniture coverings, hangings, women's and girls' dresses with great effect, and I would draw the attention of upholsterers and broad silk manufacturers to these specimens, and especially to three under No. 55. of twill silk, made of this material. Also from the warp and weft of No. 8 and 9, 255 deniers.

The silk fabrics made of Tussore are very strong, most durable, and possess much lustre.

The patterns printed in blue are the first successful application of Indigo on silk as a print, and not as a pencil blue.

They will prove remarkably fast, in fact none of the colours are printed in aniline or any other fugitive dyes.

Notice the rich tone of blue they bear, modified to some extent by the ground colour which has controlled too great a brightness.

I shall have more to say on the artistic nature of the vegetable colour products of India in my description of the collection of the dyestuffs of India exhibited in this section.

No. 24.

Three moths and six cocoons of Attacus Cynthia, a wild silk-worm of India, producing the silk known as Eri or Eria of Assam.

It is also known under the following names :—

Phalæna Cynthia (Roxburgh).
Bombyx Cynthia (Olivier).
Sania Cynthia (Hübner).
Saturnia Cynthia (Westwood).
Saturnia Arrundi (Royle).
The Arrindi or Arrundi silk worm moth (Roxburgh).

With this I must connect the Attacus Ricini (Boisduval), the same insect as far as I can gather, except that is fed on the Ricinus communis or Palma Christi plant, and is reared in a domesticated state in Assam, and over a great part of Hindustan, more especially in the districts of Dinagepur and Rangpur.

Mr. Hugon gives the following interesing particulars respecting it. "The "larva when at full size is about 3½ inches long. It spins its cocoon in "four days. The hill tribes settled in the plains are fond of eating the "chrysalis."

The cocoon is much smaller than that of the Tusseh and is soft. The natives cannot wind the silk, but spin it like cotton. Dr. Helfer says the insect is so productive as to give sometimes twelve broods a year, and that the worm grows rapidly and offers no difficulty whatever for an extensive speculation.

Mr. Atkinson says the filament is so delicate as to render it impracticable to wind off the silk; it is therefore spun like cotton. The yarn thus manufactured is woven into a coarse kind of white cloth, of a seemingly loose texture, but of incredible durability, the life of one person being seldom sufficient to wear out a garment made of it.

The winding of the Eria cocoon is said to have been recently accomplished the thickness of the Eria filament is $\frac{1}{3800}$ of an inch.

Leaving the question as to whether it can be successfully wound or not, one important consideration respecting its use presents itself, namely, its capability of being spun like cotton and wool. The great improvements made in late years in England in spinning machinery have proved that marvellous results in making an even thread from waste silk and unwindable cocoons for sewing and weaving purposes may be attained, and I will venture to predict a future for this and the produce of the unwindable silk worm cocoons that will compensate for their collection.

The industry of the natives should be stimulated to the gathering in of all kinds of wild silk cocoons, whether windable or not, for there is no doubt that those kinds which cannot be wound can be most easily spun, and there is at the present moment a request on the part of silk spinners for a larger supply of Tussore silk, cocoon and Tussore silk waste, for spinning purposes, and no doubt other silk cocoons would be gladly bought up.

No. 25.

A sample of Eria silk spun, no doubt by hand, by the Natives.

No. 26.

The same imperfectly dyed by them.

No. 27.

Eria silk made by the Ricini-fed worm of Assam.

No. 28.

The same from another district of Assam (Lakhimpur).

Nos. 29 & 30

Are specimens, male and female, of the moth :—

Attacus Atlas (Hübner).
Phalæna Attacus Atlas (Linnæus).
Bombyx Atlas (Fabricius).

This moth feeds on the Phyllanthus emblica.

No. 30.

Is a specimen of the cocoon of this splendid moth which might easily be spun.

No. 31.

Actias Selene;
Phalæna Attacus;

Feeds on Munsooree (Coriaria nipalensis). The cocoon is enclosed between two leaves. The silk does not appear to be windable, bnt is of a coarsish kind and might also be spun.

No. 32.

Cocoons of Actias Selene.

Nos. 33 & 34.

Moths, male and female, and cocoons of Bombyx Attacus (Yama Mai).

Although this insect is a native of Japan it is found also in China and India.

In Japan the silk of this worm is said to be most highly prized and reserved for the use of Royalty, but this I am inclined to doubt, as the silk is very fine, the cocoon is of a beautiful pale green colour.

It has been naturalized in Europe.

A cross between the Yama Mai and Bombyx Attacus Pernyi is a great success in France. It is so hardy that breeding is said to take place at freezing point.

Nos. 35 & 36.

Cocoons and silk of the Mooga or Moonga worm, Antherea Assama.

There are five breeds of this worm per year. They feed on the Addakoory, Champa, Soona, Kontooloa, Digluttee, Pattee, Shoonda, and Souhalloo.

No. 37.

A silk called Ya-bame from the district of Prome, Burmah, the produce of the Bombyx Mori.

No. 38.

Eggs, cocoons, moths, and silk grège of the Bombyx Mori. This is the Bengal silk of commerce. The worms feed on the leaves of the Mulberry tree as in China, Japan, and Europe.

No. 39.

"Pat" silk. A rare kind of silk from Assam, probably a variety of Bombyx Mori, but stated to be the produce of Bombyn Tentæ. The worm is fed on the Mulberry leaf.

No. 40.

A rare silk from Mezankuri-Assam.

No. 41.

Another specimen of "Pat" or "Pat Suta" silk with cocoons. A mulberry silk from Assam.

Nos. 42 & 43

A set of Tussore patterns dyed with Aniline colours.

These are placed here to show the shades Aniline dyes can be made to give on this silk, and not as a recommendation of their use in this direction. The native dyestuffs will give more permanent colours, properly mordanted. Aniline dyes are fugitive, and their use for artistic purposes or for goods intended to last a long time cannot be too seriously lamented.

No. 44.

This is a sample of ordinary Bengal Organzine, dyed with a dye-stuff common in most parts of British India, not used, as far as I know, in Europe.

It is the powder brushed off the capsules of the Mallotus Phillipensis, called in India "Kapila" or "Kamala," which contains 70 to 80 per cent. of colouring matter. By mordanting the silk with carbonate of soda and alum, the powder yields a rich variety of shades of golden yellow and orange colours. It appears to be worthy of the notice of European dyers.

Nos. 45 and 51.

A series of patterns to show to what uses the waste of Tussah Silk and the cocoons pierced by the exit of the moth can be put by spinning in the same way threads of cotton and wool are manufactured. It commences with samples of pierced cocoons which could not be wound, waste silk from ordinary Tussore manufacture, and followed by samples showing the various processes the silk undergoes before it is made into thread or cord for weaving or for sewing purposes.

This suggests forcibly a promising economy in store for the produce of all silk-making worms. There are many species unknown to commerce, rejected because of their not being capable of being wound in the ordinary way, but, as I have before stated, now spinning machinery is in such a perfect state, all cocoons may be spun and converted into materials of some use or other.

In Simla alone, there are said to be eight or nine species of Bombyx, which no doubt might be utilized in this way.

These remarks lead me to describe—

Nos. 53 and 54,

which are patterns of spun Tussore made in the way and from the material I have just described, threads of various sizes for sewing and weaving purposes as well as for fringes and knitting, dyed and undyed. They may be dyed almost any shade.

No. 56.

are fabrics made of this spun Tussore, woven undyed, in several designs for me by Messrs. Clayton, Marsdens, Holden, & Co., silk spinners, of Halifax, who also made me the samples 45 to 57 from pierced cocoons and waste Tussore with which I furnished them, from material collected for me in India by order of the Government of India.

No. 57.

A pattern of the same kind as No. 56, but which I have printed in seven colours.

Tussore silk is, therefore, proved to be capable of extended use, both from the improved manufacture I have spoken of, and from the circumstances that it is capable of being dyed and printed in the greatest variety of colours, and that the refuse portions can be spun into threads for such a variety of purposes, that there need be no waste; and I am thankful to have had the honour of being entrusted to point out the extended usefulness and application of the Tussore, and all other species of wild silks.

I attach a tabular statement of microscopic measurements of the primary fibre of Tussore and other silks.

(Signed) THOS. WARDLE,
June 18th, 1878. Leek.

Microscopic Measurements of the Diameter of the Primary Fibre of Tussore Silk and of other Silks.

Names of Worms or Moths producing Silks.		Country.	Food of Larvæ.	Measurement of the Diameter of the Primary Fibre.			
				French Metric Scale.		English Scale.	
Scientific Names.	Vernacular Names.			Loose Silk on Outside of Cocoons.	Silk forming Substance of Cocoons.	Loose Silk on Outside of Cocoons.	Silk forming Substance of Cocoons.
Bombyx mori	—	China	Mulberry	—	·0125 mm.	—	$\frac{1}{2000}$ in.
,, ,, (white)	—	Bengal	,,	—	·006 ,,	—	$\frac{1}{3750}$,,
,, ,, (yellow)	—	,,	,,	—	·0083 ,,	—	$\frac{1}{3000}$,,
,, ,,	Ya-baiue	Prome (Burmah)	,,	—	·01 ,,	—	$\frac{1}{2500}$,,
,, ,,	—	Italian	,,	—	·0108 ,,	—	$\frac{1}{2300}$,,
,, ,,	—	French	,,	—	·0135 ,,	—	$\frac{1}{1850}$,,
,, textor	"Pat"	Assam	,,	—	·01 ,,	—	$\frac{1}{2500}$,,
Attacus rincini	Eria	India	Ricinus Communis, or Castor-oil plant.	·016 mm.	·006 ,,	$\frac{1}{1500}$ in.	$\frac{1}{3750}$,,
Antherea Assama	Mugah or Moongah	—	Addakoory and various other plants.	·0135 ,,	·01 ,,	$\frac{1}{1850}$,,	$\frac{1}{2500}$,,
	Aistari Polu koa	Bheerbhoom (Bengal).	—	·01 ,,	·006 ,,	$\frac{1}{2500}$,,	$\frac{1}{3750}$,,
Antherea Paphia (Tussore)	"Tassar," "Tusseh"	India	Terminalius and other plants.	None	·03125	None	$\frac{1}{800}$,,
	Mezankuri (rare)	Sibsagar (Assam)	—	—	·01 ,,	—	$\frac{1}{2500}$,,
Actias selene	—	India	Coriaria nepalensis	·03 mm.	·02 ,,	$\frac{1}{750}$ in.	$\frac{1}{1250}$,,
Attacus Atlas	—	India (?)	Phyllanthus emblica	·03 ,,	·02 ,,	$\frac{1}{850}$,,	$\frac{1}{1250}$,,
Bombyx Attacus (the Oak Silkworm).	Yami mai	India	—	·025 ,,	·026 ,,	$\frac{1}{1000}$,,	$\frac{1}{950}$,,

T. W.

Appendix D.

Forest Conservancy in India.

The Forest Department in India is, for administrative purposes, divided into three separate establishments, the forests in the several districts immediately subject to the Government of India being under the general control of Dr. Brandis; those of the Madras Presidency under Lieutenant-Colonel R. H. Beddome; and those in the northern and southern divisions of Bombay and in Sind being under Mr. A. T. Shuttleworth, Lieutenant-Colonel W. Peyton, and Mr. J. McLeod Campbell respectively.

Forest Conservancy in India dates from the year 1862, when Dr. Brandis, then Conservator of Forests in Burmah, was appointed Inspector-General of Forests by the Government of India, and the various isolated establishments which had previously been formed in Burmah, the Central Provinces, and Oude were consolidated under him. There were at this time also Conservators in Madras and Bombay, while in the North-west Provinces the special charge of the forests had been confided to the Civil Commissioners of Meerut and Kumaon. But these officers were rather timber agents than Conservators; and though some good was effected by them in the way of regulating the felling of timber, it cannot be said that the proper work of Forest Conservancy was anywhere undertaken or even understood by them. Their only definite purpose was to secure a good net revenue from the operations of the Department.

Dr. Brandis from the very first took his stand on the opposite principle. He never lost an opportunity of keeping before the Government and the officers of the Department that the main object of forest conservancy in India is to preserve, not to cut down, the forests. At the same time he made it clear that the Department could be self-supporting, and it always has been, under his administration.

When Dr. Brandis assumed charge of the Department, the forests in most parts of India were in a deplorable condition, and the worst part of the mischief had been done only within the previous ten years, viz., between 1850 and 1860. This happened through the unrestricted depredations of the contractors for railway sleepers. When the first railway was commenced in India about 1850, the most exaggerated notions got abroad of the profits that were to be realised by selling sleepers to the railway companies. In consequence of this, every petty timber dealer in the neighbourhood of the projected lines commenced to speculate in sleepers. Unlimited credit in liquor was given to the Gonds, Bheels, Koorkoos, Koles, Khoonds, and other indigenous tribes who inhabit the forests of the great central plateau which stretches across India from east to west between the 15° and 25° of north latitude; and before the Government could become aware of it, these skilful woodmen had succeeded in felling almost every mature teak tree along the whole extent of this vast range of country. Hundreds of thousands of valuable trees were cut down which never could possibly have been converted into sleepers or removed from the forests in the shape of timber. The consequence was that the annual forest fires, passing unchecked over the hills, every year consumed the felled timber little by little, and when the first Conservancy officers were appointed in 1860, they found nothing but the charred remains of these logs to indicate where extensive forests had once overshadowed in perennial green the head springs of the Mahanuddy and Nerbuddah.

Besides this special mischief which had been done during the 10 years between 1850 and 1860, two great evils had always existed, and tended to keep down the growth of timber in India. These were unrestricted grazing

in the forests, and forest fires. The fires were caused partly by the shepherds who burnt the grass in order to get early green crops with the first rains for their cattle, and partly by *comari* or *dhya* cultivation, which is much in favour with the wild tribes all over India and Burmah, and which consists in felling and burning portions of the forest in order to sow a crop of coarse grain in the ashes.

Dr. Brandis's first step was to check and limit forest fires and cattle grazing. He abolished the name of Forest Ranger everywhere, which had previously found favor, and strongly insisted on forest officers being called Forest Conservators.

Major (now Colonel) Pearson had already been appointed forest ranger in the Nerbudda Provinces in 1860, and about the same time Colonel Ramsay and Mr. Williams had been appointed to the same office in Kumaon and Meerut. Dr. Cleghorn (Conservator of Forests in Madras) was then deputed to the Punjaub, to organise a forest administration for that province. This resulted in the appointment of Dr. Stewart as Conservator. To this appointment succeeded that of Mr. Leeds (who was transferred from Burmah) in Bengal, and of Captain Van Someren to Mysore, while Major Pearson's charge in the Nerbudda district was extended over the Nagpore country and the Berars. All these provinces, except Madras, Bombay and the North-West, were united under the supervision of Dr. Brandis, Inspector-General to the Government of India.

It was soon found that the conservancy of all the jungle spread over the continent of India would be impracticable, partly from its vast extent and partly because a large per-centage of the area was too bare and too denuded of vegetation to be capable of producing trees, except at an impossible cost. The first step, therefore, taken was to divide the better portions of the forests from the inferior. This was generally done by the Revenue Survey working in concert with the forest officers, who were entrusted with the selection. The Central Provinces set the example in this work. The better forests were marked off as "reserved" or "State Forests," to be managed entirely by the Forests Department. The remainder was divided into two portions, one of which was made over to the villages for their special use (answering to the Communal Forests in France), and the other was in some cases managed by the civil officers of the district, and in others by the Forest Department, chiefly with a view to revenue, rather than forest conservancy.

The first attempt to keep down the annual forest fires was made in the Central Provinces. This was carried out by Captain Doveton, under the orders of Colonel Pearson. The Bori forest, at the south-west angle of the Puchmurri Hills, was selected for the experiment. It is not far from the Sohagpur station on the Great Indian Peninsular Railway. The forest has an area of about 25 square miles or 16,000 acres. It was isolated by a broad line cut all round it, and divided also by fire lines, after the system pursued by the French Forest Department in the south of France and in Algiers. The experiment was perfectly successful. A few extra hands put on during the dry season, who patrolled the lines, and could collect speedily at any threatened points, sufficed to keep fires out of the reserves. Except a few isolated patches, this forest has not been burned since 1863. The beneficial effects of this plan of operations have been more marked than was even anticipated, for the long rank grass which formerly grew in the forest, and which was the great cause of danger from its inflammability, has everywhere been replaced by a shorter and finer grass, which burns much less readily; while a rich vegetable mould is gradually being formed on the hard-burnt crust of earth which formerly existed; and in consequence there is everywhere throughout these forests a sufficient crop of young seedlings springing up. The success obtained in Bori has led to the extension of the system, and fire conservancy is now one of the chief duties of forest officers in India. At the same time cattle have been gradually excluded from the reserves, and, with few exceptions, grazing is permitted in the unreserved forests only. Caution was required in at first enforcing this restriction, as in some provinces serious injury might have been done to cattle breeding had the usual grazing grounds been closed before others were provided.

It was necessary, however, that the proceedings of the Forest Department should be legalised, and with this view a Forest Act was passed by the Legislative Council in 1865. On this Act, which was confessedly imperfect and insufficient, were based the Forest Rules drawn up for each province. These also were in all cases preliminary; and a more comprehensive Act, entitled "The Indian Forest Act, 1878," received the Assent of the Governor General last March, and has now consequently become law. Its operations are, in the first instance, limited to the territories respectively administered by the Governor of Bombay in Council, the Lieutenant-Governors of the North-Western Provinces, and the Punjab (except the district of Hazara), and the Chief Commissioners of Oudh, the Central Provinces and Assam. Any other local government may, however, from time to time, with the previous sanction of the Governor-General in Council, extend this Act to all or any of the territories for the time being under its administration, by notification in the local official Gazette.

In 1868 the North-west Province Forests were placed under the Government of India. The next step taken was to organise a Forest Survey Department with a view of ensuring uniformity in the forest maps, and for training officers in surveying. Captain Bailey, R.E., was appointed to the charge of this branch, which it is now proposed to enlarge, and attach, to a forest school for the training of native forest subordinates, to be established in the Dehra Dun.

The appointment and training of forest officers has always been a matter of the greatest anxiety to all who have had to do with the control of the Department, for the future of forest conservancy in India must depend largely on the spirit of working and the principles handed down by the earlier generations of officers to their successors. In this matter it is impossible to pay too high a tribute to the practical wisdom and foresight displayed by Dr. Brandis. This officer saw at once that the only road to success lay in the appointment to the Department of officers who knew what forestry meant. With this view, so far back as 1867, he, with the sanction of the Secretary of State, entered into arrangement with the French and German Governments with a view to the training of a certain number of young men in the regular Forest Schools of those countries for the Indian service. Since that date about fifty officers have passed into the Department who have received a scientific forest training, and now nearly half the establishment in India, and amongst them several Deputy-Conservators may be reckoned as specially educated men, ranking, and in many cases keeping up intimate relations, with the Forest Officers of France and Germany. Since 1875, with a view to the better supervision of the young men Colonel Pearson has been appointed to their charge, and all the pupils are collected in the French School at Nancy, where five or six are sent annually for training.

The first idea of forming a collection of Indian timber and forest specimens for the Paris Exhibition originated with M. Mathieu, Sub-Director of the Forest School at Nancy, who has formed the valuable Museum at that School. The Indian Government warmly approved the idea, and it was taken up at once by Dr. Brandis, the Inspector General, to whose unremitting exertions the very perfect collection now offered to the inspection of the world at Paris was completed and despatched from India in time for the opening of the Exhibition. He was ably supported by Messrs. Gamble, Smythess, and other old pupils of the Nancy School, and it is proposed that the collection shall be presented, after the Exhibition is closed, to the School, for the use of the English pupils, as well as a token of recognition of the benefits that the Forest Department has received from it.

Besides the conservation of existing forests and the formation of artificial forests where required in the interests of the public, the Forest Department is instrumental in the introduction into different districts of new classes of trees, valuable either on account of their timber, fruit, or other produce, such as teak, sâl, sissu, caoutchouc, chinchona, &c. The cultivation of lac is also encouraged, whilst the important question of fibres suitable for paper stock or other manufacturing purposes has recently engaged a considerable amount of attention.

The area of natural demarcated reserved forests under the Government of India at the close of the year 1876–77 amounted to 17,421 square miles ; that of unreserved forests is not accurately known. The area of plantations, or artificial forests, amounted to 24,683 acres, or over 38 square miles ; and that protected from fire during the dry season of the year was 2,850 square miles, or over 16 per cent. of the entire reserves. During the year 5,008 persons were charged with forest offences and prosecuted, of whom 3,817 were convicted and 1,191 were acquitted. The total receipts of the Forest Department amounted, in 1876–77, to 498,452*l.*, and the expenditure to 328,068*l.*, leaving a balance of revenue to the State of 170,384*l.* Of these amounts the timber sold by the Department at its depôts realised 252,892*l.*, the expenses incurred in its collection, &c. having been 142,075*l.*, so that this branch of the operations of the Forest Department realised to Government a net revenue of 110,817*l.*

In the Madras Presidency, beyond certain fuel reserves in the railway districts of Cuddapah, Salem, Trichonopoly, and Madura, and some small tracts in Palghaut and South Arcot, there are no forest tracts that can be termed strict reserves, and no real forest from which cattle and fire can be rigorously excluded, although in almost every division there are ample tracts which might be set apart as reserves without much interference in the rights of grazing and other communal rights. The extent of fuel reserves is about 144,927 acres, or a little over 226 square miles. Land set aside for plantations aggregates 15,484 acres, of which, however, only 8,258 acres are as yet planted. The receipts of the Department in 1876–77 amounted to 41,531*l.*, and the charges to 41,397*l.*, leaving a small net balance in favour of the Department of 134*l.* Timber operations realised a sum of 18,482*l.*, at an expenditure of 9,221*l.*, thus yielding a surplus to Government of 9,261*l.* The number of persons prosecuted for forest offences during the year was 999, of whom 469 were convicted.

The total area set apart for reserved forests in the Bombay Presidency amounts to 5,654 square miles, of which 3,754 square miles are in the northern division, 1,520 miles in the southern, and 380 miles in the Sind division. Small plantations exist in most districts of the Presidency, but no regular measures have yet been adopted for the prevention of fires, which are of general occurrence in the Bombay forests. In Sind forest fires are almost entirely confined to the Upper Sind forests. In this part of the Presidency a system of enclosure has been introduced as a means of natural reproduction. Within the closed blocks, wherever the land receives moisture, either by direct flooding or percolation, a dense and vigorous growth has sprung up, and large open tracts have been thus converted into impenetrable babul thickets. The areas under reproduction in Sind aggregate 4,267 acres, in 1,147 acres of which artificial reproduction has been resorted to. The forest revenue for 1876–77 amounted altogether to 122,602*l.*, and the expenses to 83,169*l.*, which left a surplus income of 39,433*l.* The timber operations undertaken by the Department resulted in a net return of 29,838*l.*, the receipts having amounted to 62,870*l.*, and the charges to 33,032*l.* The number of cases in which persons were charged with offences against forest rules during the year was 1,520, of which 1,186 were sustained and 334 failed.

Summarising the foregoing financial results, it appears that the total receipts of the Forest Department throughout India amounted in 1876–77 to 662,585*l.*, and the charges to 452,634*l.* Timber operations realised 334,244*l.*, whilst the expenses attendant thereon amounted to 184,328*l.* The net returns to Government thus amounted to 209,951*l.*, of which 149,916*l.* was derived for the sale of timber at the departmental depôts.

It is not necessary to more than allude to the great importance of forest conservancy in its bearing on Indian famines and floods.

June 18, 1878. GEO. B.

Appendix E.

Mooltan and Peshawar Pottery and Kashmir Metal Work.

The articles sent to the Paris Exhibition are chiefly architectural in character, and comprise a copy of an old tomb in pieces numbered from 1 to 125, agreeing with the figures on a model sent with them, from which the work may be fixed on a brickwork core with plaster. Other pieces are tiles painted with the Mahomedan profession of faith, intended to be placed over graves, or Arabic quotations from the Koran for lintels and wall surfaces; and tiles with floriated ornament painted in two shades of blue for diapers.

Finials for the tops of domes were also sent. These are made in several pieces, which in actual work are fixed with plaster on a metal rod. Mosaic work of geometrical design for wall decoration, and a few flower pots and smaller vases, were also included. There is little use in the scheme of native life for pottery, and the art remains essentially architectural. Nor is the glaze sufficiently firm to withstand domestic wear and tear, as it is always covered with a raticulation of fine cracks, or, as an English potter would say, it is "crazed."

The clay appears to be of good quality for *faïence*. It is found in the neighbourhood of Mooltan, and the potters say that they pay at the rate of two annas per maund * for it. It is used without any preparation of weathering, and indeed in a climate like that of this district, where storms of dust are more frequent than showers of rain, it is doubtful whether exposure would do it any good. Moulds are only used for square tiles, and they are of the simplest kind. The use of plaster of Paris for moulds or of burnt clay moulds is apparently not known. The potter's wheel turned by hand is employed to shape circular pieces. The potters have heard of the Egyptian foot-turned wheel (the "kicking wheel" of Derbyshire), which is in use in some parts of this country, but they have not seen it or tried it.

After the objects are shaped they are dried in the sun and a coating (engobe) of a calcined, pounded and ground siliceous stone, said vaguely to come from the hills, mixed with flour paste is applied, as a "slip" is applied in Staffordshire. This engobe is in fact the white ground of the pottery and it pretty effectively hides the warm buff colours of the clay underneath. In Italy, Scinde, and indeed in most places, where an engobe is laid over coloured clay a form of decoration produced by scratching through the upper surface to the ground is in use. The French speak of this as *pâte-sur-pâte*, the Italians as *sgraffito* and in Scinde where the pottery is in most respects similar to that of Mooltan it is a favourite method of decoration. But it is not practised at Mooltan nor is the white painted on with a brush in various patterns, as is the case elsewhere.

When the white ground is dry the surface is painted. The colours used are two shades of blue and a green which, however is only manageable on large surfaces. There is no red, but a kind of violet is produced from manganese. Lajward (Lapis lazuli) is said to be used but the price of this colour makes this doubtful. The blue prepared from Zaffre and cobalt is probably meant. The patterns are invariably floral or geometrical, the potters being strict Mahomedans.

When the painting in its turn is dry the glaze is applied. It is silico alkaline made from flint, and sajji mitto, an impure carbonate of soda, prepared from the salsolaceous plants which abound in the province.

* 1 maund = 82⅔ lbs.

These substances are fired together and the frit (kanch) which results is pounded and ground and mixed with water and a little flour paste. Lead in the form of sandboor (read lead) and litharge (murdesang) are spoken of as used for fluses, but it is doubtful whether they are really employed. The use of oxide of tin to form an opaque white enamel is unknown, and borax is considered too costly for the Mooltan potter's purpose.

The kiln is small, circular in shape, fired from one mouth only with a draught up the centre round which on an earthen terrace the objects are arranged without any protection from smoke or dust. When the fire has burnt clear, the half-closed top is entirely sealed, and when the firing is complete the mouth is secured with bricks and clay. The firing lasts twelve hours and the kilne takes two days to cool.

It will be seen from the foregoing that the "biscuit" and "glost" firings are done at one operation, *i.e.* a piece of unburnt clay is put into the oven and comes out a glazed and painted tile. The green colour is an exception, the clay being first burnt and afterwards coloured.

The great fault of the Mooltan pottery is its tendency to break out in a white efflorescence similar to "reh," on the soil. The potters insist that the Mooltan water is of excellent quality, and ascribe the efflorescence to the impurity of the sajji mitti.

The reason is, probably, that there is an excess of alkali in the clay as well as in the glaze, which would be of little moment if the firing were more complete, and if all the ware were twice burned, as is the case with the best Scinde work.

The Peshawar pottery differs from the Mooltan work in many respects. I have not seen the process of manufacture, but I suspect the glaze to have more lead in it. If an engobe is used at all, it has not the fine duck-egg texture of the Mooltan work.

Cashmere Niello on Tinned Copper and Brass.

There can be no doubt of the Persian origin of the surface decoration which the Cashmeres lavish on most of their productions, and especially on their metal. The articles sent to Paris represent very fairly the present state of this craft. Compared with older samples it will be seen that the modern work is neater, smaller, and less bold in character; nor are there any plain parts left to relieve the rest.

Articles to be engraved are first shaped from sheet copper on brass, seldom cast, excepting the handles, knobs, hinges, &c.

The pattern is traced with a steel style, and is then cut with great rapidity with a hammer and small chisels or punches. When the engraving is complete the object is heated and the ground is filled in with heated lac; after which it is rubbed with deodar charcoal, which polishes the plain surface and removes the superfluous lac. The work is again heated and rubbed till the lac has lost its shine, and a dead black deposit is left in the incised parts. The whole is then tinned in the usual way, the lac acting as a reserve and stopping out the tin. Besides Cashmere, the work is made at Peshawar and Amritsar, but it is seldom as well finished. The price per seer * in Cashmere is Rs. 6, while in Amritsar only Rs. 4 are asked.

(Signed) J. L. Kipling,
January 12th, 1878. Curator, Lahore Central Museum.

---

* 1 seer = $2\frac{2}{35}$ lbs.

LONDON:
Printed by George E. Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.
[B 343.—3000.—7/78.]