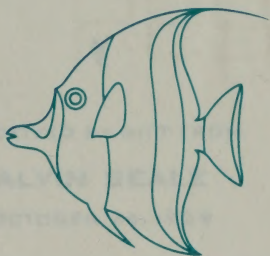


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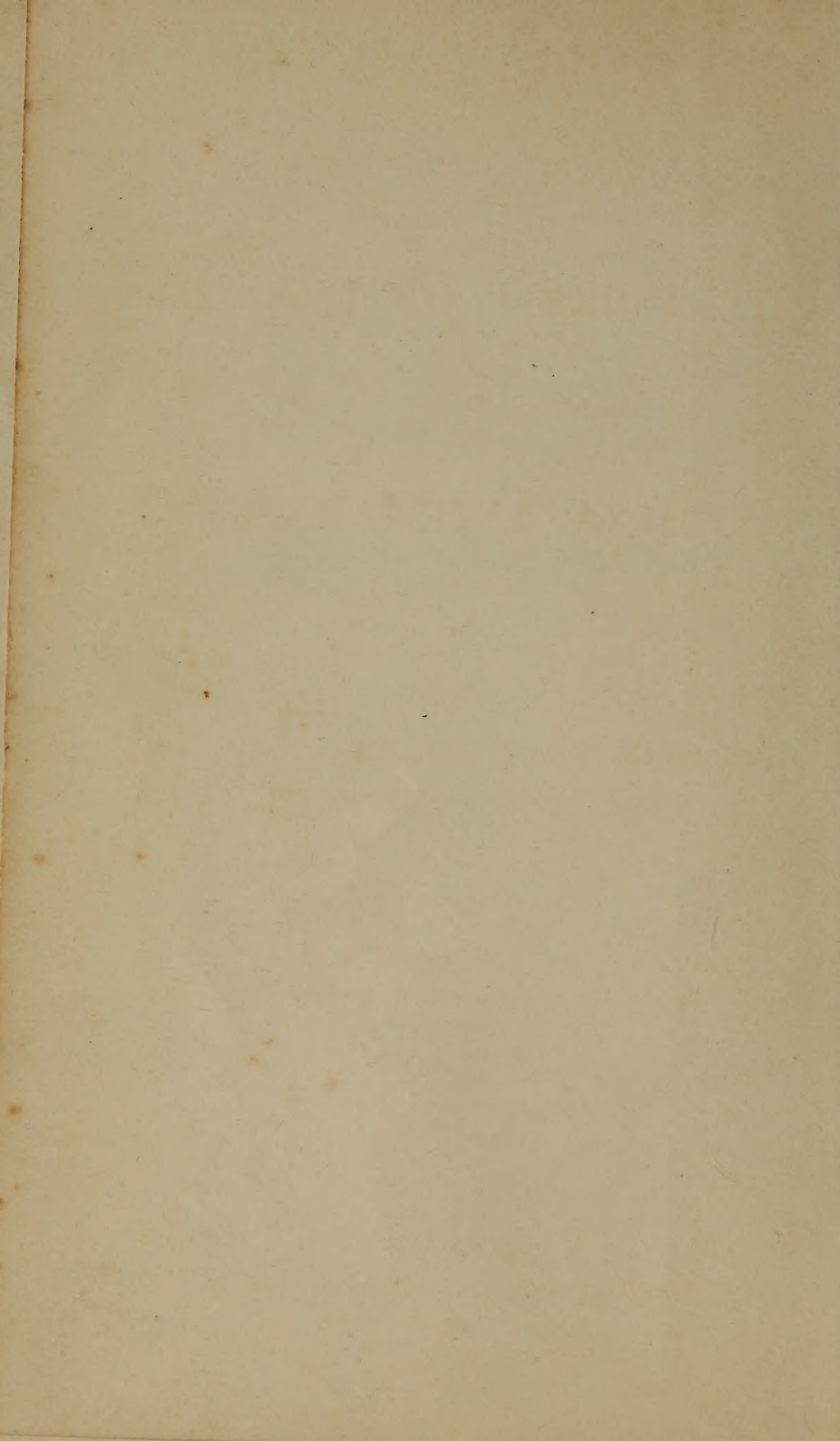
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Alvin Seale
Manila Sep 29. 1909.

REPORT

ON THE

ICHTHYOLOGY OF THE SEAS

OF

CHINA AND JAPAN.

BY

JOHN RICHARDSON, M.D., F.R.S., F.L.S., ETC.,

MEDICAL INSPECTOR OF NAVAL HOSPITALS.

[From the REPORT OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF
SCIENCE for 1845.]

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1846.



1890

PHYSIOLOGY OF THE HEAR

CHINA AND JAPAN

JOHN RICHARDSON, M.D., F.R.S.

MEDICAL DIRECTOR OF GREAT BRITAIN



LONDON

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Report on the Ichthyology of the Seas of China and Japan. By JOHN RICHARDSON, M.D., F.R.S., F.L.S., &c., Medical Inspector of Naval Hospitals.

THE following report is essentially a list of the fish which are known to inhabit the waters of the Chinese empire, to which I have added the Japanese species that have been named in the 'Fauna Japonica' of Siebold, edited by Temminck and Schlegel, and now in the course of publication. The position of the southern islands of Japan, in the same parallels of latitude with the northern coasts of China, and with only a narrow sea intervening, would lead us to believe that the species of fish which resort to the opposing shores of the two kingdoms are the same, and such is the fact as far as our evidence goes. Accurate local catalogues of animals are of much utility to the zoologist, being indispensable instruments for eliciting the geographical distribution of forms and species; but in respect of documents of this kind, ichthyology is far behind the other departments of natural history. We have ample lists of the quadrupeds, birds, reptiles and plants of most of the larger districts of the globe, but out of Europe we cannot refer to an enumeration of the fish of any country that can be said to approach completeness, with the exception of the ichthyology of the Red sea, which has been made known by the labours of Förskäl, Ehrenberg and Rüppell. The fish of Madeira have been catalogued by the Rev. R. T. Lowe, and those of the Canaries, collected by Webb and Bertholet, have been described in the ichthyological part of their work by M. Valenciennes. The fish of British India also have been extensively figured by Russell, Buchanan-Hamilton and McClelland; but much comparative examination of the species of that wide country is still required to enable us to distinguish those which are common to other countries or districts of the ocean from those which are peculiar to it. Some of the northern states also of the North American union have very laudably caused catalogues to be formed of the animals of their respective territories, and from the great 'Histoire des Poissons' of Cuvier and Valenciennes, we may extract lists, though by no means full ones, of the Acanthopterygian fish that inhabit the coasts of Brazil, the Caribbean sea, Polynesia, and the Malay archipelago; but of the ichthyology of the extra-tropical seas of the southern hemisphere, and of the whole range of the North and South American coast washed by the Pacific, it is almost silent. About a score of Japanese and Chinese fish were discovered in the time of Linnæus by Lagerström, Houttuyn, Osbeck and others, and a few were added by Langsdorff, who accompanied the Russian admiral in his voyage to the isles of Japan and the South Sea. With these exceptions, the fish of the eastern coasts of Asia, from the sea of Ochotsk down to Cochin China, were, till very recently, known to European naturalists merely by drawings of native artists, several collections of which are to be found in the British and Paris libraries*. Within the last two years Temminck and Schlegel have commenced the publication, which we have already alluded to, of Siebold's ichthyological researches in Japan, and have carried on the work to the eighth fasciculus, and through the great families of *Percidæ*, *Triglidæ*, *Scianidæ*, *Sparidæ* and *Scomberidæ*. Several novel and interesting forms have been already illustrated in this important work, most of them ranging to the southern coasts of China, and not unknown to English ichthyologists, though published for the first time in the 'Fauna Japonica.' For upwards of fifteen

* A paper published in the third volume of the Chinese Repository, and partly reprinted by Dr. Cantor in his account of the Flora and Fauna of Chusan (Annals and Mag. of Nat. Hist., vol. ix.), gives a more detailed account of what has been done by Europeans in illustration of the natural history of China.

years materials for an ample account of the fish of China have existed in England. John Reeves, Esq., who was long resident at Macao, filling an important office in the employ of the India Company, with an enlightened munificence, caused beautiful coloured drawings, mostly of the natural size, to be made of no fewer than 340 species of fish which are brought to the markets at Canton. These drawings are executed with a correctness and finish which will be sought for in vain in the older works on ichthyology, and which are not surpassed in the plates of any large European work of the present day. The unrivalled brilliancy and effect of the colouring, and correctness of profile, render them excellent portraits of the fish they are intended to represent; but further details of a technical kind, such as the distribution of the teeth in the roof of the mouth, the numbers of the gill-rays, and the fine serratures and denticulations on the edges of the opercular pieces, are required for the location of the species in their proper genera. Such minute characters, which can be detected, in many instances, only by aid of a lens, require to be exaggerated to be shown in a drawing, and indeed, when the serratures of the gill-pieces were sufficiently large to be conspicuous to the naked eye, the Chinese artist has seldom failed to represent them. Mr. Reeves had four copies of these drawings made. One set, which he presented to General Hardwicke, is bound up with that officer's large collection of sketches of Indian fish, in four folio volumes, which he bequeathed to the British Museum. These volumes have been inspected by many English and foreign ichthyologists, and, among others, by Müller and Henle, who refer to them in their excellent 'Plagiostomen.' Another copy, left by Mr. Reeves at Macao with Mr. Beale, formed the groundwork of the enumeration of Chinese fish in Bridgeman's 'Chrestomathy,' in which, by the way, very numerous mistakes in the generic names occur. A third copy, which he liberally lent to me, is the foundation of this report*. The Banksian library also contains a work entitled 'Figuræ Piscium Sinensium a Pictore Sinensi pictæ,' which is referred to by M. Valenciennes in the sixteenth and seventeenth volumes of the 'Histoire des Poissons,' treating of the *Cyprinidæ*; the same library possesses a Japanese treatise on fishes, with their Chinese names appended, and with coloured plates; and a manuscript work entitled, "Descriptions of Animals," being an account, in the Linnæan method, of the various species, both terrestrial and marine, observed in a voyage to India and China, with pen and ink figures of small size, but well-executed. The author is unknown. There are also several Chinese works in the library of the British Museum containing figures of fishes, but they are far inferior to the others we have mentioned, and look more like fanciful designs than natural history

* General Hardwicke began his collections of illustrations of Asiatic zoology in the last century, and continued them till his final return to this country in 1818. He lost many specimens and the fruit of much labour by three several shipwrecks; but this, instead of damping his ardour, roused him to fresh exertions, and he was busy up to the time of his death in preparing his collections for publication, the scientific part having been undertaken by Mr. Gray. Among the drawings of fish which he procured, there are some by Major Neeld, others by Major Farquhar, and a considerable number copied from the drawings of Buchanan Hamilton, by that gentleman's consent, and by the same artists which he employed. This is mentioned because a charge of piracy has been made in the Calcutta Journal against General Hardwicke, who was however too high-minded to appropriate to himself the labours of others without due acknowledgement; and the careful references in his own writing on the drawings of Buchanan Hamilton, show that he had no intention of claiming anything that belonged to that distinguished naturalist. The General bequeathed his specimens and the whole of his collections of drawings, amounting to twenty folio volumes, to the British Museum, and also set apart a sum of money to defray the expense of publishing the scientific description of them. His collections have been deposited, as he wished, in the national institution, but his intentions respecting the publication have been entirely frustrated by a chancery suit, which was instituted soon after his death.

illustrations. Mr. Reeves deposited in the British Museum specimens of Chinese fish, both dried and preserved in spirits, part of them the very examples which are figured in his drawings. His son, J. R. Reeves, Esq., has likewise presented various fish procured at Macao to the British Museum; among which are several species not figured in his father's drawings. The Rev. George Vachell, who was Chaplain to the India Company at Macao fifteen years ago, collected about 100 species of fish there, and presented them to the Philosophical Institution at Cambridge, in whose museum they are preserved in spirits, and mostly in good condition. One or two small collections made at Chusan have reached the India House from officers serving there during the late war, and several have been sent to Haslar Hospital by the naval officers employed on various parts of the coast, more especially by R. A. Bankier, Esq., surgeon in the Royal Navy, and Captain Sir Edward Belcher, whose specimens are figured in the 'Ichthyology of the Voyage of the Sulphur,' recently published by aid from the Treasury under the auspices of the Government. The College of Surgeons of London also possesses a small number of Chinese fish, procured by Sir Everard Home in the estuary of the Yang tsze keang, the great river which falls into the entrance of the Yellow sea. An assemblage of Chinese fish, exceeding all these in number, exists in the Chinese collection, made by Mr. Dunn, and now exhibiting at Hyde Park. The proprietor most liberally permitted me to examine this important collection; but owing to my residence at a distance from London, and the way in which the bottles holding the fish are secured in screwed-up cases, I have not been able to avail myself of this permission to the necessary extent for the identification of known species or the description of new ones. In the same collection there are also many coloured drawings of fish. The following list is drawn up from these various sources. Looking to the number of species which it includes, I cannot but consider it as a pretty full enumeration of the fresh-water and marine fish of the eastern coasts of the Chinese empire, and it will furnish the inquirer into the geographical distribution of forms with several important facts. The ichthyology of China forms a material link in the evidence by which we are enabled to trace the variations in the numbers and grouping of species from the seas of Ochotsk, Kamtschatka and Behring's Strait southwards, by the Philippines, Malay archipelago, Javan sea and Torres Straits to the coasts of Australia. The 'Ichthyology of the Voyage of the Erebus and Terror,' under the command of Sir James Clark Ross, another work which owes its existence to the support of Government, will contain a much fuller account of the fish of the higher southern latitudes than any previous ichthyological publication, together with figures of at least 100 new species, some of them taken beyond the 71st parallel. In fact, the gradual disappearance of the arctic forms in the seas of Japan and the north of China, their replacement by other assemblages in the warmer latitudes, and their re-appearance on the coasts of Van Diemen's Land, the southern islands of New Zealand, the Aucklands and other antarctic lands, may be followed with equal, if not more accuracy than similar gradations can be traced through the Atlantic ocean.

General ichthyology has not made sufficient progress to enable us to deduce the laws by which the geographical distribution of species is regulated. The only modern work which professes to describe all the species is yet in progress, and judging from the numerous additions of new species made by every scientific expedition that has left Great Britain or France since the publication of the first ten or twelve volumes of the 'Histoire des Poissons,' we are assured that very many fish remain to be incorporated in it when it sees

a new edition, or in any other work that embraces the same objects; and in regard to the extent of range of the described species, the alterations will be no less important. I shall not therefore attempt more in this paper in reference to the geographical distribution of fish than merely to mention one or two facts that have some bearing on opinions at present entertained by geologists. Much stress has been laid upon the existence of tropical forms of fish in the ancient deposits of northern latitudes as a proof of the high temperature of the earth in former ages; but I believe that the range of inter-tropical species is less restricted than it has been supposed to be. Among the Bermudas, on the 32nd parallel, the *Chatodontidae* are so abundant that they are preserved in basins inclosed from the sea as an important article of food for the garrison and inhabitants; and a considerable number of fish range northwards from the Brazils to the coasts of the United States, some of them even to the banks of Newfoundland. It is probable that the gulf-stream has something to do with this, as fewer tropical forms seem to reach the same parallels on the coasts of Europe. If so, there is probably a current of a similar kind setting to the northward on the coasts of China, for many species which abound in the Indian ocean range as far north as Japan. M. Agassiz says, "Les Xiphioides de Sheppy ont tous le bec arrondi comme le Tetrapture et les Histiophores; or ces derniers ne quittent jamais les mers du Sud." (Rep. Br. Ass. for 1844, p. 305.) Yet M. Bürger has discovered a *Histiophorus* on the south-west coasts of the Japanese isles, and the same or another species exists in the seas of New Zealand.

Several remarkable generic forms described in the 'Fauna Japonica,' such as *Hoplegnathus* or *Scarodon*, *Histioporus*, *Melanichthys* or *Crenidens* and others, have been detected also in the Australian seas. In short, from the 42nd degree of south latitude to the same parallel north of the equator, between the meridians which include Australia, New Zealand, the Malay archipelago, China and Japan, there is but one ichthyological province, though towards the respective extremes there is a mingling of antarctic and arctic forms with a corresponding diminution in the numbers of the intertropical ones. But in the middle portion of this province its dimensions in longitude are vastly extended. Very many species of the Red sea, the eastern coast of Africa, Madagascar and the Mauritius, range to the Indian ocean, the southern seas of China, the Malay archipelago, the northern coasts of Australia, and the whole of Polynesia,—the almost continuous ranges of islands apparently favouring their distribution. A comparatively small number of these species enter the Atlantic, and such as do are mostly Scomberoids, Scopelinae, Lophobranchs, Plectognathes or Sharks. It is repeatedly remarked in the 'Histoire des Poissons,' that few species of fish cross the Atlantic. From this observation, the Scomberoids which skim the surface of the high seas ought perhaps to be excluded; and some allowance must also be made for South American species discovered on the African coasts and islands since the time that the passages in the 'Histoire des Poissons,' to which I allude, were written. But with these qualifications, the remark appears to be well-founded, and the great bulk of species on different sides of the Atlantic are different. When we seek for some cause which may explain this difference in the distribution of the fish of the two oceans, we observe that the bounding shores of the Atlantic run north and south, with a deep sea between them, and no transverse chains of islands. On the other hand, we have from Africa eastward, within the warmer districts of the ocean, a continuous range through the Indian ocean and archipelago, the Malay archipelago and Polynesia, which embraces three-fourths of the circumference of the globe; there being no points of continent which cut through that

great zone and project into the colder regions to the southward*. Could we suppose so extensive a belt, having a breadth of sixty degrees of latitude, to be suddenly elevated, we should find the remains of fish scattered over it to be everywhere nearly alike;—the species having a local distribution being comparatively few and unimportant. These spoils of fish would of course, if the opinions of Professor E. Forbes be well-founded, be associated with assemblages of mollusks and other marine animals, varying according to the depth at which the deposit took place. When we advance northwards in the Atlantic, beyond the 44th parallel, the number of species common to both shores increases. The salmon of America is identical with that which frequents the British Isles and the coasts of Norway and Sweden, and the same is the case with the codfish and several other members of the Gadoid family, and also with some Cottoids. The Cottoids increase in number and variety as we approach the Arctic circle, and this is the case also in the northern arm of the Pacific, though the generic forms differ from those of the Atlantic. From the near approach probably of the Asiatic and American coasts at Behring Straits, the fish on both sides are nearly alike, down to the sea of Ochotsk on the one side, and Admiralty inlet on the other. In the sea of Japan, and the neighbouring coasts of China, we find northern forms associated with many common to the temperate and warmer parts of the ocean. In the colder regions of the southern hemisphere there is again a predominance of the Cottoid and Gobioid families, but with a dissimilarity in some of the generic forms, though there are also many genera identical with those of the northern ones. We again find in the southern seas codfish much like those of the north, and *Notacanthus* and *Macrourus*, two very remarkable Greenland genera, which inhabit deep water, and are seldom procured except when thrown up by storms, have recently been discovered on the coasts of New Zealand and South Australia. Several genera are peculiar to the southern hemisphere, such as *Notothenia*, *Bovichthys* and *Harpagifer*; and of these we find the same species at the Falklands, Cape Horn, Auckland Islands and Kerguelen's Land; in fact, in the whole circle of the high latitudes. The fish of the New Zealand seas differ little from those of Van Diemen's Land and South Australia.

From what has been stated, it appears that the ichthyology of the Australian seas has an Asiatic character † as opposed to the Atlantic or South American assemblages of species. The fish of the Pacific coasts of America

* Neither the objects nor the limits of this report admit of a full consideration of the manner in which an archipelago extending in longitude favours the diffusion of many species of fish; but I may remark cursorily, that the multiplication of places of deposit for spawn on the shores of the islands and intervening coral banks, and the appropriate food that many fish find in such places, may have much influence. The *Chaetodontide*, *Labridae*, *Balistidae* and other groups of littoral fish, are among the most remarkable for the extensive range of species. Some of the *Lophobranchi* who inhabit floating beds of sea-weed, to which they adhere by their prehensile tails, have also an extensive range; the moveable and extensive beds of *Sagasso* being, in fact, as far as they are concerned, so many islands.

† Mr. Gray informs us, that setting aside the Marsupials of Australia, which are of a different group from the South American ones, the ordinary quadrupeds, of which many species are now known, have an Asiatic character; and that all the Australian reptiles are like those of the Old World, while those which inhabit the Galapagos belong to American groups. The genera, he goes on to remark, of the Australian reptiles are mostly peculiar, but belong to Asiatic, or at least to Old World families. One species, named *Geco verus*, is common to Australia and to India and its islands, and the *Plestiodon 5-lineatum*, which is very common in North America, exists also in Australia and Japan, and may perhaps have been introduced. The genus, which is a very natural one, and well-characterized, consists of five species, viz. the cosmopolite one that we have mentioned, a second one inhabiting America, a third one belonging to North Africa, and two to China. Specimens from different localities have been carefully examined by Mr. Gray, who considers the diffusion of the species of this genus as an anomaly in the geographical distribution of reptiles.

are too imperfectly known to enable us to ascertain how many of them range to the other side of the great ocean. Is there a marked change either in generic forms or species between the eastern limits of Polynesia and the American coasts?

The desultory observations I have thrown out respecting the distribution of fish apply more particularly to the marine osseous fish, but those which compose the sub-class of *Cartilaginei* have even a more extensive range. The sharks of the China seas and of Australia are for the most part identical. One of them, the *Cestracion*, has attracted the attention of geologists on account of the teeth of an ancient species having been found in European deposits, associated with fossil palms and other plants of the warmer regions. But whatever inference may be drawn from the character of the plants, no great reliance ought to be placed on the teeth of the *Cestracion* as an indication of the temperature when the deposit was made. The Australian species, or one differing from it chiefly in colour and little in form, inhabits likewise the seas of China and Japan; and when deposits now forming are revealed to the eyes of future geologists, its spoils will be found associated with the Huon pines of Van Diemen's Land, the *Eucalypti* of New Holland, the fern trees of New Zealand, or with the vegetation of the temperate parts of Asia, according to the locality that is explored.

With regard to *freshwater fish*, China agrees closely with the peninsula of India in the generic forms, but not in species. It abounds with *Cyprinidæ*, *Ophicephali* and *Siluridæ*. As in the distribution of marine fish the interposition of a continent stretching from the tropics far into the temperate or colder parts of the ocean separates different ichthyological groups; so with respect to the freshwater species, the intrusion of arms of the sea running far to the northwards, or the interposition of a lofty mountain chain, effects the same thing. The freshwater fish of the Cape of Good Hope, and the South American ones are different from those of India and China. The remarkable mailed Siluroids of intertropical America are unlike any freshwater fish of Africa or Asia, while the *Ophicephali* are almost exclusively Asiatic; a genus of the same family being found at the Cape of Good Hope but none in America. The *Cyprinidæ* have been said to be wanting in Polynesia and Australia. In the coral islands of Polynesia their absence is clearly owing to the want of lakes or rivers, and of Australia it may be said that the rivers have not been sufficiently explored. They exist in the larger islands of the Javan chain, and it is likely that the same species will hereafter be detected in the northern parts of Australia. And the Cyprinoid family is not altogether unknown in Australia. A curious marine Cyprinoid, the *Rhynchana greyi* (Ichth. of Voy. of Erebus and Terror), is not rare in the seas of New Zealand and South Australia. It has been a prevalent opinion that the *Cyprinidæ* are exclusively freshwater fish, but the *Catastomi* of North America frequent the estuaries of the rivers which fall into the Arctic sea, living indifferently in the salt and fresh water, and thriving wherever they find proper food. The anadromous Percoids differ very slightly in form from others that are purely inhabitants of fresh waters; and many examples of the same kind might be adduced from among the marine fish*. The common anadromous salmon (*Salmo salar*) does not descend beyond the 41st degree of latitude on the eastern coast of America, and it is probably restrained within similar bounds on the eastern coast of Asia, for we find no representations of it among the

* In the genera *Ambassis* and *Apogon*, there are species truly marine, with others closely resembling them, that inhabit fresh waters and even thermal springs of high temperature. Most of the *Coregoni* pass their whole lives in inland waters, but many individuals, carried down to the sea by river floods, live and thrive in the brackish or salt waters of the estuaries: and the brackish lagoons of Port Essington on the north coast of Australia furnish full-grown examples of *Carangi*, *Mesopriones*, and other fish considered to be purely marine.

Chinese drawings. It is said by ichthyological writers to be an inhabitant of all the northern part of the Old World, from the entrance of the Bay of Biscay northwards, by the North Cape, along the Arctic shores of Asia and down the coasts of Kamtschatka to the sea of Ochotsk, including the Baltic, White sea, Gulf of Kara and other inlets*. Other kinds of salmon abound in the estuaries of Kamtschatka, and on the opposite coast of America down to the Oregon, but none appear to descend to China.

In the following list Mr. Reeves's drawings are quoted by their original numbers in his portfolio, and also as they are now placed in the volumes bequeathed by General Hardwicke to the nation. A few of Mr. Reeves's drawings, which are not in General Hardwicke's collection, are also quoted. When I have seen Chinese examples of any of the species enumerated in the list, I have seldom omitted to mention the museum in which they are deposited; and when nothing is said of specimens, it is to be understood that the species is named from the inspection of Mr. Reeves's drawings, or when there is no figure on the authority of the authors quoted. The Chinese names are in some cases written from sound and not from sense†. The sounds in English characters and the translations were furnished to me by Mr. Reeves and Mr. Birch, of the British Museum.

Mr. Reeves informs me that few of the fishes represented in the drawings are brought to the tables of foreigners. Soles are almost constantly presented at breakfast, and the *Sciæna lucida* generally forms a part of that meal. The *Leucosoma*, or White Bait of the residents, and a *Serranus*, are regular dinner dishes; and the *Polynemus* called Salmon-fish and the *Stromateus* or Pomfret, when in season. Sturgeon is occasionally seen. The Chinese eat all kinds, from a shrimp to a shark; but Carp, Bream, *Siluri*, *Ophicephali* and Gobies, are the principal fish seen in the markets of Canton.

In drawing up the list I have received much aid from John Edward Gray, Esq., Keeper of the Zoological Department of the British Museum, who had commenced a work on the subject; and great facility in consulting the books and specimens of that institution. With the same want of reserve the Museum of the Cambridge Philosophical Institution was opened to me; and I have already mentioned the liberality of the late proprietor of the Chinese collection at Hyde Park.

Sub-classis CARTILAGINEI.

Ordo SQUALI.

Fam. SCYLLIIDÆ.

SCYLLIUM MACULATUM, Gray, Hardw. Illustr. Ind. Zool. t. 98. f. 1. Müller und Henle, Plagiostomen, seite 5. taf.; *Icon.* Reeves, 264; Hardw. Cartil. 38. Chinese name, *Laou hoo sha*, "Tiger shark" (Birch); *Laou hoo sha*, "Tiger shark" (Reeves).

The British Museum possesses a Chinese specimen presented by General Hardwicke. Mr. Reeves's figure measures 2 feet 4 inches, and is the portrait of an individual which was 3 feet long.

Hab. China sea. Indian ocean. Canton.

* Professor Nilsson mentions that salmon inhabit the freshwater lakes of Sweden named Wenern and Siljan during the winter and spring, and then ascend the rivers to spawn, returning to the lakes again to recruit, as salmon of other rivers do to the sea. The same habit has been ascribed to the salmon of Lake Ontario.

† That is, when the proper character is a complex one, the writer will substitute one of the same sound but of a more simple form, hence the apparent want of meaning of some of the English translations. See note, p. 200.

SCYLLIUM BURGERI, M. und H., seite 8. taf. 2.

Hab. Sea of Japan.

CHILOSCYLLIUM PLAGIOSUM, Bennett (*Scyllium*), Life of Raffles, p. 693; M. und H. p. 17. *Scyllium ornatum*, Gray, Hardw. Ill. t. 98. f. 2. var. 2. M. und H.; *Icon.* Reeves, 252; Hardw. Cartil. 45. var. 3. M. und H. Chinese name, *Pan chüh sha*, "Striped bamboo shark" (Birch, Reeves); *Icon.* Reeves, a. 2; Hardw. Cartil. 44; Chinese name, *Ta sha*, var. 4 M. und H.

The British Museum possesses an example of the second variety which was brought from China by John Reeves, Esq., and there are others in the collection of the Cambridge Philosophical Society, also obtained at Canton by the Rev. George Vachell. Figure 252 in Mr. Reeves's portfolio measures 2 feet 4 inches, and β 2 nearly 14 inches.

Hab. Seas of Japan and China, the Indian ocean and the coasts of the Brazils! (M. und H.)

CROSSORRHINUS BARBATUS, Lin. (*Squalus*); M. und H. 21. taf. 5. Watt's shark, Phillips's Voy. to Bot. Bay, p. 168. pl. 43. *Le squale barbu*, Brouss. Lacép. i. p. 247. *Squalus barbatus et lobatus*, Bl. Schn. pp. 128, 137. *Scyllium lobatum*, Cuv. Règ. An. ii. p. 387.

Hab. Seas of Japan and Australia. An Australian specimen exists in the museum at Haslar.

Fam. CARCHARIDÆ.

CARCHARIAS [SCOLIODON] ACUTUS, Rüpp. Chondr. p. 5. taf. 18. f. 4; M. und H. 29. *Scoliodon russellii*, Gray. *Icon.* Reeves, a. 5; Hardw. Cart. 50 & 47. Chinese name, *Sha tsze*, "Sharkling" (Birch); *Sha yu*, "Shark-fish" (Reeves); *Sha u* (Bridgem. Chrest. 184).

The British Museum possesses a specimen of this shark from Canton, presented by John Reeves, Esq.

Hab. China seas. Canton. Javan sea. Indian ocean and Red sea.

CARCHARIAS [PRIONODON] DUSSUMIERI, Valenc.; M. et H. 47; *Icon.* Reeves, a. 1; Hardw. Cartil. 51. Chinese name, *Tse tow sha*, "Regular head shark" (Birch); *Chae tow sha*, "Even-headed shark" (Reeves) (Bridgem. Chrest. 186).

Hab. China sea. Canton. Indian ocean.

CARCHARIAS (PRIONODON) MELANOPTERUS, Quoy et Gaim., Freyc. Voy. pl. 43. f. 12; Bennett, Life of Raffl. p. 693; Rüpp. Chondr. p. 3; M. und H. 43. *Sq. requin*, Lacép. i. p. 169. pl. 8. f. 1; *Icon.* Reeves, a. 3; Hardw. Cart. 49. Chinese name, *Woo yih sha* (Birch); *Woo yih sha*, "Black-finned shark" (Reeves); *U sih sha* (Bridgem. Chrest. 187).

Hab. China sea. Waigiou. Javan sea. Timor. Australian seas. Red sea.

SPHYRNA ZYGÆNA, Rondelet, p. 389; Ray; Lin. Bloch, 117 (*Squalus*). *Koma sorra*, Russ. 12. *Zygæna malleus*, Valenc. Mém. du Mus. ix. p. 223. pl. 11. f. 1; Yarrell, ii. p. 406. *Z. lewisii*, Griff. An. Kingd. pl. 50. *Sphyrna zygæna*, M. und H. 52; *Icon.* Reeves, a. 4; Hardw. Cart. 59. Chinese name, *Kung tsze sha* (Birch); *Kung tsze* means children's toys (Reeves); *Kung tsz mo sha* (Bridgem. Chrest. 189).

Hab. China seas. Canton. Indian ocean. Brazilian coasts. Mediterranean. Coasts of France and English channel.

Fam. GALEIDÆ.

GALEUS JAPŌNICUS, M. und H. 58.

Hab. Sea of Japan.

Fam. SCYLLIODONTIDÆ.

TRIAKIS SCYLLIUM, M. und H. 63.

Hab. Sea of Japan.

Fam. MUSTELIDÆ.

MUSTELUS VULGARIS, M. und H. Smooth hound, Yarr. ii. p. 333.

Hab. Japanese and China seas. Australian coasts. Cape of Good Hope. Atlantic. Mediterranean. English channel.

Fam. LAMNIDÆ.

LAMNA CORNUBICA, Lin. (*Squalus*), Gmel. 1497; Goodenough, Lin. Tr. iii. p. 80. pl. 15. *Porbeagle*, Borlase, Cornw. p. 265. pl. 26. f. 4; Yarr. p. 384, and Beaumaris shark, p. 387. *Sq. monensis*, Penn. iii. pl. 7; Shaw, Zool. v. p. 350. *Lamna cornubica*, Cuv. Règn. An. ii. p. 389; M. und H. 67.

Hab. Coasts of Norway. The Sound. English channel. Mediterranean. Atlantic. Sea of Japan.

Fam. CESTRACIONTIDÆ.

CESTRACION ZEBRA, Gray, Zool. Misc. p. 5; *Icon.* Reeves, 174; Hardw. Cart. 52. Chinese name, *Maou urh sha*, "Cat-shark" (Birch); *Mau e sha*, "Kitten-shark" (Reeves); *Mau i sha* (Bridgem. Chrest. 185).

Specimens of this fish from China exist in the British Museum and in the museum at Haslar. They are all banded transversely, and very differently from the Australian specimens of *C. philipi*. We have compared drawings of recent examples of this fish with Mr. Reeves's of *zebra*, and find them to be very dissimilar in their markings, but the species are very much alike in form. Müller and Henle most probably consider them to be identical, as they mention *C. philipi* as an inhabitant of the Japanese seas. Small examples of *zebra* may be found in the Chinese insect-boxes.

Hab. Sea of China.

Fam. NOTIDANIDÆ.

HEPTANCHUS INDICUS, Cuv. Règn. An. p. 39; Agass. iii. tab. E. f. 1. (*Notidanus*), M. und H. p. 82. tab.

Hab. Seas of China, Australia, and the Indian ocean.

Ordo RAJÆ.

Fam. RHINOBATIDÆ (*Squatina*, M. und H.).

RHINA ANCYLOSTOMUS, Bl. Schn. p. 352. t. 72; Gray, Hardw. Ill. Ind. Zool. pl. 102. f. 2, The jaws. *Icon.* Reeves, β. 74; Hardw. Cart. 69, 70, 71; Owen, Odont. pl. 23, The teeth. Chinese name, *Pe pa sha*, "Guitar shark" (Birch); *Pe pa yu*, "Pe pa shark." "The *pe pa* is a musical instrument like the guitar" (Reeves). *Pe pa u* (Bridgem. Chrest. 164).

Mr. Reeves deposited a Chinese specimen of this fish in the British Museum.

Hab. Seas of China (Reeves). Indian ocean (Bl.).

RHINOBATUS SCHLEGELII, M. und H. p. 123. tafel.

The British Museum possesses one of Bürger's specimens, which differs a little from the figure in Müller and Henle's work, in having larger eyes, and somewhat differently shaped spout-holes.

Hab. Sea of Japan.

RHINOBATUS HYNNICEPHALUS, Richardson. *Icon.* Reeves, α. 7; Hardw. Cart. 63. Chinese name, *Le tow shä* (Birch); *Lae tow sha*, "Plough-headed *sha*" (Reeves); *Lai tou sha* (Bridgem. Chrest. 186).

I have seen no specimen of this fish, but after a careful comparison with the description and figures of the species of the several sub-genera composing this genus, as constituted in the 'Plagiostomen' of Müller and Henle, it was not found to correspond with any of them.

The disc is wider than that of *R. schlegelii*, the length being in proportion to the breadth as 7 : 6 : it is more undulated on the fore edge, there being a conspicuous widely-rounded lobe opposite the eyes, and the snout is acuminate, but yet blunt at the point. A single acute tooth on the hinder edge of the spout-holes. The width of the disc somewhat exceeds one-third of the whole length of the fish. Colour shining yellowish-brown, with specks of a darker tint of the same, arranged for the most part so as to form small sub-circular areas. Length of the figure $19\frac{1}{2}$ inches.

Hab. China seas. Canton.

PLATYRHINA SINENSIS, M. und H. p. 125. *Raie chinoise*, Lacép. i. p. 34 et 157. pl. 2. f. 2; *Icon.* Reeves, 182; Hardw. Cart. 74. Chinese name, *Hwang teen poo**, "Yellow spotted ray" (Birch).

A Chinese specimen exists in the British Museum.

Hab. Seas of China and Japan. Canton.

FAM. TORPEDINIDÆ.

NARCINE TIMLEI, Bl. Schn. (*Torpedo*), p. 359; Henle, Narc. p. 34. taf. 2. f. 4; M. und H. p. 130.

Hab. Indian ocean and sea of Japan.

NARCINE LINGULA, Richardson. *Icon.* Reeves, 227; Hardw. Cart. 72. Chinese name, *Muh cho poo*, "Wooden ladle handle ray" (Reeves); *Muh cheoh po* (Bridgem. Chrest. 240); *Themilly yar*, Hindostanee.

Mr. Reeves's drawing shows only the upper surface of the fish, but I possess another figure executed by the late Dr. Wight in India, which gives a view also of the under disc, and shows that this *Torpedo* belongs to the sub-genus *Narcine*. The upper lip is entire with a slight point at the central bridle, and the dental plates turn out over the upper and under jaw. In the outline of the disc it resembles the *Nalla temere* of Russell (pl. 2), but in this fish the ground colour is white and the spots more round and regular.

The width of the disc is to its length as six to seven, and as it is widest posterior to its middle, it has a very broadly ovate form, without any angles, the snout being rounded. The breadth of the disc is equal to the length of the tail from the anus to the tip of the caudal fin. The ventrals have a slightly convex edge with the fore and hinder corners only moderately rounded. The claspers project beyond its edge. First dorsal rather larger than the second. The distance between the eyes and edge of the snout is equal to a fourth of the width of the disc, and the spout-holes, which are larger than the orbits and have smooth edges, are contiguous to them. Colour of the upper surface reddish-brown, with larger and smaller dark liver-brown spots, the largest being placed on the middle line of the back and tail. Some of the spots which lie round the electrical apparatus run into curved bars, and there are two longitudinal dark bars on the ventrals. The under surface is white, with reddish and purple tints round the edges of the various parts. Length of the figure 13 inches. Breadth of the disc 5.2 inches.

Hab. China seas. Canton (Reeves). Indian ocean. Madras (Wight).

Muh cho poo, Reeves, 6; Hardw. Cart. 73.

This figure has the same Chinese name with the preceding one, and much the same colours and spots, but it presents such difference in form, that, looking to the general accuracy of Mr. Reeves's admirable collection of drawings, prevents me from considering it as a representation of the same fish; yet the discrepancies are not sufficient in the absence of specimens to induce me to name it as specifically distinct. The general proportions of length and breadth do not differ greatly from those of *lingula*, but the disc is more widely rounded anteriorly, and more gibbous just behind the eyes, making an approach, though a slight one, to the sub-rhomboidal form of *N. indica*. The posterior corners of the disc overlap the ventrals rather more, and the latter are considerably larger with a more rounded outline. They extend backwards to the middle of the first dorsal. The second dorsal is drawn a trifle larger than the first. The eyes also are proportionally nearer to each other and to the fore-edge of the disc than in *lingula*. There are some slight differences in the spots, but scarcely so much as to require description. The posterior lobes of the disc are deeply tinged with arterial blood-red, but the colours in other respects are the same. The fish represented was a female, as no claspers are shown. Length of the figure 16 inches, width 8.3 inches.

Hab. China sea. Canton.

* The term *poo* comprises a Chinese genus, which may be generally translated as "ray."

Fam. RAIIDÆ.

RAIA KENOJEL, "Bürger," M. und H. p. 149. tafel; *Icon.* Reeves, 198; Hardw. Cart. 77. Chinese name, *Päng sha poo* (Birch), "Butterfly *Poo ray*" (Reeves).

Müller and Henle describe the colours of the dried fish as uniform. In Mr. Reeves's drawing the ground colour is clove-brown, shaded obscurely with liver-brown, and with a reddish-brown tint before the eye. There are also many paler wood-brown spots, which are sprinkled with dark dots. Exterior to the eyes on each side, six of the smaller pale spots are arranged so as to form a ring round a central one: similarly arranged spots occur near the margin of the widest part of the disc on each side, and also more posteriorly, while nearer the mesial line on each side there is an uninterrupted pale ring with a central spot, and a like ring exists on the posterior lobe of the disc. The edges of the under surface, which are partially shown in the drawing, are purplish-red. The spines correspond better with the letter-press description than with the figure given in the 'Plagiostomen' of Müller and Henle. Length of figure 14 inches, width $8\frac{1}{2}$.

Hab. Seas of China and Japan. Canton.

Fam. TRYGONIDÆ.

TRYGON UARNACK, Rüppell, Atl. p. 51; Chondr. taf. 19. f. 2 (*Pastinachus*). M. und H. p. 158. *Tr. omescherit*, Forsk. 9; Rüpp. Atl. p. 51. *Tryg. russellii*, Gray, Ill. Ind. Zool. 100; *Icon.* 89. Hardw. ined. (a drawing of *Tr. russellii*); *Icon.* Reeves, a. 37; Hardw. Cart. 91 (*Fœmina*). Chinese name, *Hwa kin*, "Variegated ray" (Reeves); *Icon.* Reeves, 279? Hardw. Cart. 90 (*Mas*)?

A specimen in spirits and a dried skin from the Indian seas were bequeathed by General Hardwicke to the British Museum.

Hab. Sea of China. Indian ocean. Red sea and Cape of Good Hope.

TRYGON AKAJEL, "Bürger," M. und H. p. 165. tafel.

Hab. South-west coast of Japan.

TRYGON ZUGEI, "Bürger," M. und H. p. 165. tafel.

Hab. Sea of Japan and China. Macao (Belanger). Indian ocean.

TRYGON BENNETTII, M. und H. p. 160. tafel; *Icon.* Reeves, a. 45; Hardw. 87 & 88, which is a duplicate. Chinese name, *Hwang poo*, "Yellow ray" (Reeves, Birch).

A Chinese specimen exists in the British Museum.

Hab. China sea. Caribbean sea! (M. und H.)

TRYGON CARNEA, *Icon.* Reeves, 226; Hardw. Cart. 86. Chinese name, *Pih yüh poo*, "White jade-ray" (Birch); "White-fleshed ray" (Reeves).

This ray has much resemblance in form to the *Tr. walga*, as figured by Müller and Henle, and still more to the *Tenkee shindraki* of Russell (pl. 5), or to *Tr. bennettii*, M. und H.; but it has a considerably longer tail than either, and slight indications of both an upper and an under short hem-like seam on the tail. The form of the disc is obovate, with a sharp point to the snout, but no incurvature of the fore-edge, nor any decided convexity. Its breadth at the hinder edge of the spout-holes is equal to its length, excluding the ventrals, and the tail measures fully twice as much. The eyes are distant from the point of the snout one-quarter of the length of the disc, and less than that from each other. Two small spines (or perhaps pores) are situated side by side between the posterior edges of the spout-holes on the middle line. Colour, pale flesh-red, almost white in parts; the tail darker towards the point. It is possible that this may be merely a variety of *Tr. bennettii*. Mr. Reeves thinks that it is the young of some species. Length or breadth of disc, $2\frac{1}{4}$ inches.

Hab. China sea. Macao.

PTEROPLATEA MICRURA, Bl. Schn. (*Trygon*), p. 300; M. und H. p. 169. *Tenkee kunsul*, Russ. 6. *Raia pœcilura*, Shaw, 291. *Trygon pœcilura*,

Bennett, Life of Raffles, p. 694; *Icon.* Reeves, 209; Hardw. Cart. 80 (*Fæm.*); and Reeves, a. 48; Hardw. Cart. 78, 81 dupl. (*Mas*). Chinese name, *Peih yu*, "Shoulder-fish" (Reeves); this var. has three spots on each pectoral fin. *Icon.* Reeves, 235; Hardw. Cart. 82; Chinese name, *Fe peih poo*, "Flying shoulder ray;" this is a monstrosity with pectorals divided, so that it appears to have four fins.

Hab. China and Javan seas. The Indian ocean and Red sea.

Fam. MYLIOBATIDÆ.

MYLIOBATES NIEUHOFFII, Bl. Schn. p. 364 (*Raia*). M. und H. p. 177. *Mookharra-tenkee*, Russ. 7. *Fasciated ray*, Shaw, Zool. 286. *Myliobates aquila*, Bonap. F. It. *Raia macrocephala*, *Icon.* Parkins. in Bib. Banks. 48; *Icon.* Reeves, a. 38; Hardw. Cart. 97. Chinese name, *Chang ying*, "Spread kite" (Birch); "Broad eagle" (Reeves); *Cheung ung* (Bridgem. Chrest. 157).

Hab. Chinese and Australian seas (Reeves, Solander). Indian ocean. Mediterranean (M. und H.).

MYLIOBATES MACULATUS, Gray, Hardw. Ill. Ind. Zool. pl. 101; M. und H. p. 178; *Icon.* Reeves, 212; Hardw. Cart. 99 & 100 (duplicate). Chinese name, *Hwa teën chang ying*, "Long ray" (Birch); *Fa teem chang ying*, "Flowered-spotted long ray" (Reeves); *Ta tim cheung ang* (Bridgem. Chrest. p. 158).

Hab. China sea. Indian ocean.

MYLIOBATES VULTUR, M. und H. p. 179.

The British Museum contains an example of this species from China.

Hab. Chinese seas.

? MYLIOBATES OCULEUS, *Icon.* Reeves, 281; Hardw. Cart. 98; *Ein Myliobatis (oder Aëtobatis) der vielleicht nur eine Varietät des M. maculatus ist.* M. und H. p. 129 (*in notâ*).

In this drawing the disc of the fish is thickly covered with eyed spots, which are inclosed in blackish-green reticulations. Each spot has a pale silvery central disc, surrounded by a blackish ring, which is shaded off, and is itself enchased in a broader pale wood-brown border. The disc is rounded on each side in front, and falcate behind, with a small acute point forming its interior tip. The figure is about 22 inches long, of which 16 inches is tail. The width of the disc from tip to tip is $8\frac{3}{4}$ inches. I have met with no specimen of this fish.

Hab. Sea of China. Canton.

? AETOBATES FLAGELLUM, Bl. Schn. 361. tab. 73?; M. und H. 180; *Icon.* Reeves, 273; Hardw. 101. Chinese name, *Hih jow chang ying*, "Black-fleshed spread kite" (Birch); *Hah yoh chang ying*, "Black-bodied long Eagle" (Reeves).

Hab. China seas. "Indian ocean. Red sea."

Obs. *Icon.* Reeves, 236; Hardw. 102. Chinese name, *Hung tsuy ying*, "Red-lipped kite" (Birch); *Hung tsuy ying*, "Thick-nosed ray" (Reeves).

This is, perhaps, a violet-coloured variety of *Aëtobates? flagellum*.

Hab. Macao, in July.

Ordo STURIONES.

Fam. STURIONIDÆ.

ACIPENSER CHINENSIS, Gray, Hardw. Ill. pl. 98. f. 5.

Hab. China. Spec. Br. Mus.

It is probable that some species of *Chimæra* or *Callorhynchus* exists in the seas of China and Japan. We have seen a small figure of the latter, which was sketched at Bow Island; but we have not met with a *Petromyzon* in any of the collections of Chinese fish or drawings.

Sub-classis OSTINOPTERYGII, *MacLeay*.

Ordo PLECTOGNATHI.

Fam. TETRODONTIDÆ.

DIDON PUNCTATUS, Cuv. Règ. An. ii. p. 367. *D. attinga*, Bl. 125. *D. hystrix*, Bl. 126.

Sir Edward Belcher brought several small specimens from the Chinese seas.

Hab. Sea of China. Malay archipelago. Indian ocean and Red sea.

TETRODON BIMACULATUS, Bennett (*nova sp.*), Zool. of Beechey's Voy. p. 50; Richardson, Ichth. of Sulph. Voy. p. 119. pl. 57. fig. 7-9. *Tet. fasciatus*, McClelland, Cal. Journ. p. 412. pl. 21. f. 2 (non Bl. Schn.).

Specimens were brought from China by Sir Edward Belcher, and others exist in the Chinese collection at Hyde Park.

Hab. Sea of China.

TETRODON OCELLATUS, Osbeck (*Diodon*), Eng. trans. i. p. 365; Bl. 145; *Icon.* Reeves, 271; Hardw. Cart. 15. Chinese name, *Yu po* (Reeves); *Yu paou*, "Jade bubble" (Birch); *Kai po y* (Osbeck); Rich. Ichth. of Sulph. Voy. p. 120. pl. 58. f. 1, 2.

Specimens of this fish, in spirits, exist in the British Museum and Chinese collection at Hyde Park, and its dry skins are very common in the insect-boxes sold at Canton.

Hab. China. Canton. Chusan. Japan. It is said in Bl. Schn. to inhabit fresh waters near the sea.

TETRODON OCELLATUS, var. *guttulatus*, Richardson, Ichth. of Sulph. Voy. p. 121. pl. 58. f. 3; *Icon.* Reeves, 96 o; Hardw. Cart. 13. Chinese name, *Ke paou*, "Fowl bubble."

A specimen was deposited by Mr. Reeves in the British Museum. The colour in the drawing is honey-yellow on the back, with the large spots above the pectorals, and at the root of the dorsal dark umber-brown, the small ones silvery.

Hab. China.

TETRODON ALBO-PLUMBEUS, Richardson, Ichth. of Sulph. Voy. p. 121. pl. 58. f. 6, 7. Japanese fishes, Br. Mus. No. 17.

A specimen exists in the British Museum, which may be readily confounded with the var. *guttulatus* of *ocellatus*. It is distinguished by the course of the porous lines on the snout, and the distribution of the spines on the body. The figure in the Japanese fishes, which I have supposed to represent the adult of this species, has much resemblance to the *T. honckenii* of Bloch. 143. *Confr. Tetrodon kappa Reuffell 23 f. 2.*

Hab. China and Japan.

TETRODON SPADICEUS, Richardson, Ichth. of Voy. of Sulphur, p. 123. pl. 58. f. 4 & 5.

The British Museum possesses a specimen presented by Mr. Reeves, and there are others in the Chinese Collection at Hyde Park.

Hab. China. Canton.

TETRODON LATERNA, Richardson, Ichth. of Voy. of Sulphur, p. 124. pl. 61. f. 2; *Icon.* Reeves, 99; Hardw. Cart. 14. Chinese name, *Täng lung paou*, "Chinese lantern-bubble" (Birch); *Tsung lung paou*, "Bladder lantern" (Reeves); *Tsang lung pau* (Bridgem. Chrest. 239).

A pencil sketch made by Ellis in 1780, on Cook's last voyage, at Pulo Condore, China, most probably refers to this species. He states the rays to be D. 11; A. 11; C. 9; P. 17.

Hab. China.

TETRODON HISPIDUS, Lin., Amœn. Acad. Chinens. Lagerstr. Dec. 23, 1754 (non Lacép.).

Hab. China.

ORTHAGORISCUS SPINOSUS, Cuv. Règ. An. ii. p. 370; Richardson, Ichth. of Sulph. Voy. p. 125. pl. 62. f. 10–12. *Orth. hispidus*, Bl. Schn. p. 511. *Diodon mola*, Pall. Spic. Zool. viii. p. 39. t. 4. f. 7; Kœlr. Nov. Com. Petr. x. pl. 8. f. 3.

A specimen exists in the British Museum, which was brought from the Chinese seas.

Hab. Sea of China.

ORTHAGORISCUS OBLONGUS, Bl. Schn. p. 511. t. 97. Yarr. Br. Fishes, ii. p. 534. pl. *Tetrodon truncatus*, Penn. Br. Zool. iii. p. 170. pl. 22. Donov. pl. 41. *Tetrodon lune*, Lacép. i. pl. 22. f. 2; *Icon.* No. 29. Japanese fishes, Br. Mus.

It is possible that several species may be confounded under the appellation of "oblong sun-fish," a point which must be determined by a comparison of specimens from various quarters of the ocean. Mr. Yarrell's figure is not so high as Bloch's, which, according to Cuvier, was drawn from a fish taken at the Cape of Good Hope. Lacépède's figure corresponds with this in form, but it is variously striped, and is made a distinct species in the 'Règne Animal' under the name of *O. varius*. Mr. Yarrell however observes, that the British examples acquired beautiful waved stripes after death. The Japanese figure has the form of Bloch's.

Hab. The whole Atlantic. Cape of Good Hope. Chinese seas. Japan.

OSTRACION CORNUTUS, Lin., Bl. 133; Bl. Schn. p. 500; *Icon.* Reeves (*nullo numero non Hardw.*).

Hab. Chinese seas. Canton. "India. Barbadoes" (Bl. Schn.).

OSTRACION ACULEATUS, "Houttuyn, in Haarl. 20 Deel. ii. 346;" Bl. Schn. p. 500.

Not having seen a drawing or specimen of this, I do not know how far it differs from the preceding species.

Hab. "In mari Japonico" (Bl. Schn.).

OSTRACION HEXAGONUS, "Thunberg, N. S. A. xi. 101. f. 3;" Stock. Trans. 1790. p. 107; Bl. Schn. 502.

Hab. "Mare Japonicum" (Bl. Schn.).

OSTRACION STELLIFER, Bl. Schn. 499. tab. 97. f. 1. Japanese Fishes, fig. 36.

Hab. Seas of China and Japan. Specimen in the British Museum.

Fam. BALISTIDÆ.

BALISTES STELLARIS, Lacépède (*Le Baliste étoilé*), i. p. 350. pl. 15. f. 1; Bl. Schn. 476. *Somdrum yellakah*, Russ. 23?. *Balistes occultator*, Hard., *Icon.* ined. *B. oculus*, Gray, Hardw. Illust. pl. 90. f. 1.

Specimens were brought from the Chinese seas by Sir Edward Belcher. Russell's figure shows fewer and proportionally larger spots, and less star-like than those exhibited by the specimens.

Hab. Sea of China (Belcher) and the Indian ocean (Hardw.).

Sir Edward Belcher's collection also contains *Balistes aureolus* (Richardson, Ichth. of Sulph. Voy. p. 126. pl. 59. f. 1, 2), and *B. castaneus* (id. pl. 59. f. 5, 6), which may possibly be from the Chinese sea; but the locality of their capture was not noted.

BALISTES VETULA, Lin. Chinensia Lagoer. Amœn. Acad. 1754; Bl. 150; Less. Voy. de la Coq. pl. 9. f. 2.

Hab. Sea of China. Indian ocean. Atlantic. Island of Ascension (Osbeck).

BALISTES HIHPÉ, Richardson, Ichth. of Voy. of Sulph. p. 127. pl. 60. f. 2; *Icon.* Reeves, a. 35; Hardw. Cart. 22. *Hih pe yang*, "Black-skinned yang or ocean-fish" (Reeves, Birch)*.

Hab. China seas. Canton.

* Of this Chinese name, with that of *Monacanthus chinensis*, the artist writing down from sound has used two characters with different meanings for the same idea.

BALISTES FRENATUS, Commerson apud Lacép. (*Baliste bridé*), i. p. 335 et 381. pl. 15. f. 3; *Icon.* Reeves, 229; Hardw. Cart. 23; Rich. Ichth. of Sulph. &c., p. 129. pl. 62. f. 1.

Hab. China seas. Canton.

BALISTES VACHELLII, Richardson, Ichth. of Sulph. Voy. p. 129.

A specimen exists in the collection of the Cambridge Philosophical Society, presented by the Rev. George Vachell.

Hab. Sea of China. Canton.

BALISTES ALBO-CAUDATUS, Commerson apud Lacép. i. p. 336 et 382. pl. 18. f. 2 (*Baliste armé*). Rüppell, Neue Wirbelb. pl. 16. f. 1; *Icon.* Reeves, 265; Hardw. Cart. 21 & 23. *Bal. subarmatus*, Gray, Hardw. Ill. Ind. Zool. pl. 90. f. 3?

Hab. Sea of China (Reeves). Indian ocean (Hardw.). Red sea (Rüpp.).

BALISTES CONSPICILLUM, Bl. Schn. 474. *Le Baliste Americain*, Lacép. i. p. 377. pl. 16. f. 2; Quoy et Gaim., Uranie, pl. . f. 1; Less. et Garn. Voy. de la Coquille, pl. 9; *Icon.* Reeves, 285; Hardw. Cart. 20.

Hab. Sea of China. Malay archipelago. Indian ocean. Mauritius and sea of Madagascar.

BALISTES RINGENS, Bl. 152. f. 2. *Le Baliste silonné*, Lacép. i. p. 370. pl. 18. f. 1. *B. nigra* (*ringens*, Lin.), Osbeck, Voy. Eng. tr. ii. p. 93. *B. niger*, Bl. Schn. 471.

Sir Edward Belcher brought a specimen from China.

Hab. Sea of China. Sumatra. Indian ocean. Isle of Ascension (Osbeck).

MONACANTHUS CHINENSIS, Osbeck (*Balistes*), Voy. i. p. 177, Eng. tr.; Bl. 152. f. 1; *Icon.* Reeves, 89; Hardw. Cart. 31 (*et ab Indiá*, 28?). Chinese name, *Hih pe yang*, "Black-skinned goat" (Birch); "Black-skinned sheep" (Reeves); *Hah pe yeang* (Bridgem. 50).

Specimens exist in the British Museum and Chinese collection at Hyde Park.

Hab. Sea of China (Reeves). Indian ocean (Hardw.). Australia (Ichth. of Er. and Terr.).

MONACANTHUS BIFILAMENTOSUS, Lesson, Voy. de la Coq. p. 109. pl. 8; *Icon.* Reeves, 266; Hardw. Cart. 32.

A specimen presented by Mr. Reeves, obtained at Canton, is preserved in the British Museum.

Hab. Seas of China and the Moluccas.

MONACANTHUS JAPONICUS, "Tilesius (*Balistes*), Mém. de Moscou, ii. pl. 13;" Cuv. Règn. An. ii. p. 373; *Icon.* Reeves, 275; Hardw. Cart. 33. *Tabaduck*, Draw. by Dep. Ass. Comm. Gen. Neill, of King George's Sound fish, No. 51, Br. Mus.

Not having access to the Memoirs of the Natural History Society of Moscow at present, the identity of Tilesius's fish with specimens brought by Sir Edward Belcher from the sea of China, and with others from South-west Australia, and also with the drawings above quoted, is to be considered simply as a conjecture.

Hab. Seas of China. Japan and Australia.

MONACANTHUS LINEOLATUS, Richardson. *Rad.* A. 34; C. 12; P. 13.

A specimen of this fish was sent from Hong Kong to Haslar Museum by Surgeon R. A. Bankier, of the Royal Navy. It has lost the dorsal fin by friction, but is otherwise in good condition. Its height at the tip of the pelvic spine is equal to half its total length, and its greatest thickness is rather less than one-third of the height. The profile is an irregular oval, beyond which the short trunk of the tail projects not more than a tenth of the whole length. The face ascends in a straight line to the dorsal spine, whose height is equal to one quarter of the height of the body. The space between this spine and the second dorsal, corresponding in length to the spine, is horizontal and somewhat depressed. The pelvic bone is not capable of being stretched much out of the oval, and the membrane behind it is thin, not capable of lateral distension, and without rays, but having the small scales narrower and farther apart than on the body, and thus admitting of a slight folding-up. The edge of the

membrane is convexly curved. The skin is covered with small scales which are each composed of a dozen or more minute spines that appear to stand out on every side, but the skin feels rough only when the finger is drawn towards the head. These scales do not appear to differ in size on any part of the head or body when viewed by the naked eye, but on the lateral parts of the tail the numerous spines of each scale are seen through a lens to be replaced by one, two, or three fine recurved bristles. All the fin-rays are rough, with minute points, and the dorsal is armed on each side by a row of pretty strong recurved spinous teeth, its front being rough like the other rays. The small trigger-ray in its axilla can be detected only by dissection. The point of the pelvic bone is a knob set with spines somewhat coarser than those of the scales. The pectoral fin is small and the gill-opening does not descend below the base of its first ray. There is no peculiarity in the scales which border this opening. The colour, after maceration in spirits, is purplish-gray, with about twelve interrupted horizontal dark lines on the body, running from the head to the caudal fin. There are also some spots on the face. No lateral line can be detected. There are two dark vertical bands on the caudal. This species is readily distinguished from *M. biflamentosus* and *chinensis* by the want of the strong curved caudal spines, and from *M. japonicus* by the profile, the form of the scales and dewlap, and by the horizontal dark streaks. It differs from the *monoceros* of Osbeck (Voy. i. p. 173) in the anal rays being only thirty-four instead of fifty-one. Indeed I believe that the species alluded to by Osbeck, and also his *scriptus* (p. 174), are referrible to the *Aleuterus* mentioned below. Length of the specimen 5 inches. Height of body $2\frac{1}{2}$ inches.

Hab. Coasts of Hong Kong.

ALEUTERES LÆVIS, Bl. 414. (*Balistes*), Richardson, Ichth. of Sulph. Voy. p. 131. pl. 61. f. 3. *Balistes monoceros*, Solander; *Icon. Parkins.* No. 64, Bib. Banks. *Balistes scriptus*, Osbeck, i. p. 174, Engl. tr.?

Hab. China seas? Canary islands. Caribbean sea.

ALEUTERES BERARDI, Lesson, Voy. de la Coq. Ichth. p. 107. pl. 7; Richardson, Voy. of Sulph. p. 132. pl. 61. f. 1; *Icon. Reeves*, 173; Hardw. Cart. 34. Chinese name, *Sha mong*, "Sand dog" (Reeves); *Sha mang* (Bridgem. Chrest. 49).

Specimens were brought from China by Sir Edward Belcher.

Hab. Seas of China and New Guinea.

TRIACANTHUS BIACULEATUS, Bl. 148. f. 2. (*Balistes*), Cuv. Règn. An. ii. p. 374; *Icon. Reeves*, A. 24; Hardw. Cart. 36. Chinese name, *Pe yang* (Birch); *Po pe yang*, "Naked skin" (Reeves); *Moh pe yeang* (Bridgem. Chrest. 48).

Specimens of this exist in the Chinese collection at Hyde Park, the British Museum, and the museum at Haslar. Examples from different localities vary in the comparative height of the body and a little in the distribution of the black marks. An Indian example has a broad black stripe on the preorbitar.

Hab. Seas of China, the Malay archipelago, Australia, and the Indian ocean.

Ordo LOPHOBRANCHII.

Fam. SYNGNATHIDÆ.

SYNGNATHUS HARDWICKII, Gray, Hardw. Ill. pl. 89. f. 3.

Dried specimens, tied up in bundles, are brought in numbers from China, and many examples exist in the British and Haslar Museums.

Hab. Seas of China and India.

SYNGNATHUS BIACULEATUS, Bl. 121. f. 1, 2; Bl. Schn. p. 515. t. 1.

Hab. Seas of China and the Philippines; and the Indian ocean. Spec. Br. Mus.

Other species inhabit the Chinese seas, but we have not yet had time to determine what they are.

Fam. PEGASIDÆ.

PEGASUS LATERNARIUS, Cuv. Règn. An. ii. p. 364. *in notis*.

Common in the Chinese insect-boxes. Many examples in the British Museum and at Haslar Hospital.

Hab. Sea of China and Japan.

PEGASUS LATIROSTRIS, Richardson.

Specimens exist in the British Museum, and are occasionally to be met with in the Chinese insect-boxes. They have the general form of *P. draco*, but the beak is nearly as broad as it is long. As in the others, the beak is grooved in the centre above and below, and the edges of the upper groove are elevated so as to form a furrowed crest with an irregular outline. The flat lateral plates of the snout are transversely ridged, and toothed on the edges by the points of the ridges. In *laternarius* the edges of the inferior groove of the beak are elevated, and the mesial line above is partially so, making seven ridges. The whole is shorter and much narrower than that either of *draco* or *latirostris*, yet specimens of the latter with the lateral edges of the beak mutilated may be mistaken for it.

Hab. Sea of China.

SOLENOSTOMUS PARADOXUS, Pallas, Spic. viii. p. 32. t. 4. f. 6 (*Fistularia*).
Seba, 3. 34. f. 2; Bl. Schn. p. 114. t. 30. f. 2.

Hab. Amboyna. Probably China? Some Chinese drawings appear to be extravagant representations of this fish.

Ordo CTENOBANCHII.

Fam. LOPHIIDÆ.

LOPHIUS SETIGERUS, Wahl, in skrifter af naturh. iv. p. 215. tab. 3. f. 5, 6.
L. viviparus, Bl. Schn. p. 142. t. 32. *L. setigerus*, C. et V. xii. p. 383;
Icon. Reeves, 161; Hardw. 299. Chinese name, *Shin ma yu*, "Quivering flax-fish" (Birch); *Chin ma yu* (Reeves); *Chan ma u* (Bridgem. Chrest. 51). *Rad.* D. 3-8; A. 9; C. 9; P. 17; V. 1½.

Small specimens of this fish, pinned down and dried, abound in the boxes of insects sold at the Chinese ports to foreigners. The museum at Haslar contains several of a larger size, taken in the China seas by Sir Edward Belcher, but they have been unfortunately considerably injured by friction during their voyage to England. Mr. Reeves's drawing of the recent fish leaves however little to be desired. In form it agrees with Bloch's figure, but the latter exaggerates the spines of the head. The humeral or coracoid spine is alike in both representations. The general colour is hair-brown, finely marbled by a lighter tint on the upper surface of the body and pectoral fins. A blackish mark speckled with white occupies the pectoral axilla. The caudal is less sharply banded than in Bloch's figure; a pinkish hue spreads over the anal, which, like the dorsal, is unspotted,

Hab. The Japanese and China seas. Canton.

CHEIRONECTES RANINUS, Tilesius, Mém. de Moscou, xi. pl. 16. *Ch. marmoratus*, Cuv., Less. et Garnot, Voy. du Duperrey, pl. 16. f. 2; C. et V. xii. p. 402.

M. Valenciennes considers the New Guinea *Cheironectes*, procured by the naturalists of *La Coquille*, to be the same with that previously discovered on the coasts of Japan and named by Tilesius.

Hab. Coasts of Japan and New Guinea.

HALIEUTEA STELLATA, Wahl. (*Lophius*), Mém. d'Hist. Nat. de Copenh. iv. p. 214. t. 3. an. 1797; Tilesius, Voy. de Krusenst. pl. 61. f. 3 et 4.
Lophius muricatus, Shaw, Zool. pl. 162; *Icon.* Reeves.

Dried specimens of this fish exist in almost every ichthyological museum. Under surface coloured, in Mr. Reeves's figure, of a bright lake-red. Upper surface aurora-red, clouded with reddish-brown, with many specks of lake and groups of small black spots, the whole having a freckled appearance. Fins bright lake-red with black edges.

Hab. China and Japan.

Tribus CYCLOPODI (Müller).

Fam. ECHENEIDIDÆ.

ECHENEIS NAUCRATES, Lin. Bl. 171; Russell, 49. Australian remora, Griff. Cuv. 10, plate opposite to p. 504. *Echeneis vittata*, Rüpp. Neue Wirbel. seite 82; *Icon.* Reeves, 97h; Hardw. Malac. 286, 287.

On comparing specimens from the Caribbean and African seas, Polynesia, Western Australia, and Bass's straits, no difference of any importance was detected, except in the number of fin-

rays and valves of the sucking apparatus, which I have found however to vary as widely among individuals from the same locality, so that the ray-formula might be given as D. 2|33 to 38; A. 2|32 to 38; Discal valves 23 to 26. A young Chinese specimen which was presented to the British Museum by Mr. Reeves, has the following numbers: Br. 9; D. 2|38; C. 17; P. 21; V. 1|5; Discal valves 24. It agrees with a specimen of the same size in the same museum which was captured at Tenasserim. Dr. Rüppell observes, that the many individuals which he had an opportunity of observing in the Red sea presented constant differences in the numbers of the fin-rays and in colour from the Atlantic fish. In regard to the latter, I have stated above the variations of the rays that exist in the few specimens furnished by the museum at Haslar; and in respect to colour, I may add that the patterns they present appear to be infinite. I have seen on the western coast of Africa some hundreds attached to the bottom of a ship, and darting off in a dense body to partake of the washings of the cook's coppers or any other greasy matter that was thrown overboard. All had, it is true, a very disagreeable-looking livid ground colour and a dark band on the cheek more or less extensively prolonged on the flanks, but the rest of the dark marks seemed to be alike in no two individuals. Specimens 6 or 8 inches long have a trapezoidal caudal fin, but when they attain 18 inches or more the end of the fin is lunate, and the curve seemingly increases in older individuals, as it is pretty considerable in a specimen 2½ feet long.

Hab. Seas of China, the Malay archipelago, Australia, Polynesia and India. The Red sea and the Atlantic on both sides.

Fam. CYCLOPTERIDÆ.

GOBIESOX TUDES, Richardson, Ichth. of Voy. of Sulph. p. 103. pl. 46. f. 1-3.

Hab. China seas? Spec. in Sir E. Belcher's collection.

Fam. GOBIIDÆ.

Forster, in his 'Faunula Sinensis,' which comprehends the discoveries of preceding ichthyologists, enumerates only four members of this family, under the names of *Gobius niger* (Osbeck), *G. eleotris*, *G. anguillaris*, and *G. pectinirostris* (L.). These will be noticed under their respective heads.

GOBIUS FASCIATO-PUNCTATUS, Richardson, Ichth. of the Voy. of the Sulphur, p. 145. pl. 62. f. 13, 14; Descript. of Anim. p. 148. fig. 98. *Icon.* Reeves, 146; Hardw. Acanth. 278. Mus. Brit. Chinese name, *Sun hong* (Reeves). *Rad.* D. 6|-1|9; A. 1|8; C. 19; P. 17; V. 1|5-1|5, united.

This species belongs to a group of Gobies which have the depressed head and general aspect of *Philyppus dormitator*, and is very nearly allied to *Gobius russellii* (C. et V. 12. p. 75). It strongly resembles *G. kokius*, pl. 14. f. 1. of Jacquemont, Voy. dans l'Inde, which may be the same, though there are some differences. A specimen was presented to the British Museum by John Reeves, Esq., and there are examples of it in the Chinese collection at Hyde Park and in the museum of the Cambridge Philosophical Society.

Hab. Canton. Runs with great swiftness over the paddy-grounds at Whampoa.

GOBIUS CHINENSIS, Osbeck, p. 260, Trad. Allem. *G. eleotris*, Lin. ed. xii. in Chin. *Sinn-hao* (Hist. de Poiss. xii. p. 138); *Icon.* Reeves, f. 89. "*Rad.* B. 5; D. 6|-11; A. 8; C. 12; P. 18; V. 8, united." The Chinese name is written *Sinn-has* in the English translation, ii. p. 32.

In Mr. Reeves's drawing the back is mottled blackish-green, with clusters of grass-green and golden specks on the sides. The belly is grayish and silvery, the pectorals clay-coloured, the ventrals blackish-gray, and the vertical fins hair-brown, with two darker bars on the second dorsal.

Hab. Macao.

GOBIUS PLATYCEPHALUS, Richardson. *Icon.* Reeves, l. 94. *Rad.* D. 6|-9; A. 1|9; P. 15; C. 25. (Spec. Cam. Ph. Inst.)

A single specimen of a Goby, not in very good condition, exists in the museum of the Cambridge Philosophical Institution, having been brought from China by the Rev. George Vachell. It belongs to the group of *kokius*, but I have not been able to identify it with any of those described in the 'Histoire des Poissons.' It has a depressed head with the eyes almost touching, an advancing lower jaw and a rounded caudal. Teeth setaceous, not crowded, and disposed much like those of a *Serranus*. The outer row on the lower jaw is composed of somewhat taller recurved ones. Four of the very short upper and under caudal rays appear

to be not jointed. Scales large, ciliate, with flabellate streaks on the disc. Cheeks and perhaps the gill-cover naked. General colour dark or blackish, mottled with pale irregular spots, lower jaw spotted with liver-brown and white. Dorsal mottled by rows of black specks on the rays. Mr. Reeves's drawing shows irregular blackish-green specks thickly spread over the olive-green ground colour of body and head, with an admixture of reddish-orange on the lower part of the sides and belly, the whole having a dark hue. Vertical fins olive-green and hair-brown obscurely mottled. Pectorals gall-stone yellow, with a blackish mark on the scaly base. The figure shows seven rays in the first dorsal.

Hab. Macao.

GOBIOUS RIPILEPIS, Richardson. *Rad.* D. 6|–1|10; A. 1|10; C. $17\frac{6}{6}$; P. 21; V. 1|5–1|5, united.

This species is of the group headed in the 'Histoire des Poissons' (xii. p. 85) by *G. venenatus*. The height of the head is equal to half its length, which is contained four times and a quarter in the whole length of the fish, or thrice and a half when the caudal is excluded. Belly prominent behind the ventrals, and the height there equals the length of the head. Lower jaw rather longest. Small eyes more than a diameter apart. Teeth in broad villiform plates, with those in the outer row a little taller, especially on the sides of the upper jaw and front of the lower one. A small canine on the middle of each limb of the lower jaw. Scales ciliated, with strong streaks diverging from the free apex of their exposed rhomboidal discs. Head scaly, forward to the eyes. A porous curved line beneath the eye, a longitudinal one crossing the middle of the cheek, and another on the upper edge of the interoperculum. First dorsal about twice as high as the second one. Caudal fenestrated by clear points, but its colours have perished. Six rows of roundish or arrow-headed clear specks correspond with the rows of scales on the sides, and there is a series of pale curved muscular marks along the lateral line. The Rev. G. Vachell's specimen, deposited in the museum of the Cambridge Philosophical Society, measures $3\frac{3}{8}$ inches.

Hab. Macao.

GOBIOUS MARGARITURUS, Richardson. *Rad.* D. 6|–1|12; A. 1|10; C. $17\frac{6}{6}$; P. 17; V. 1|5–1|5, united.

Another species of the same group, deposited in the same institution by the Rev. G. Vachell, is distinguished by a series of silvery specks running down the middle of the tail. These specks, six in number, are irregular in form, and the first is placed over the vent, a narrow silvery stripe coincident with the spinal column preceding it. There are also a few silvery specks on the nape, one on the temples, another on the gill-cover, and two lines of pores on the cheek. The scales are pretty large, ciliated and faintly streaked. The body has a linear form, its height being about the eighth of the whole length of the fish. Head bluntly rounded in profile at the snout, with the jaws equal. Teeth minute, but the outer row taller, the villiform inner ones being very low and much crowded. A recurved canine in the middle of the limb of the lower jaw. Eyes a full diameter apart. Caudal pointed.

Hab. Macao.

GOBIOUS FILIFER, C. et V. xii. p. 106; *Icon.* Reeves, 276; Hardw. *Rad.* D. 6|–1|10; A. 1|8; C. 21; P. 17; V. 1|5–1|5, united.

The Indian fish described under this name in the 'Histoire des Poissons' is made the type of a group of Gobies which have short bodies and minute scales buried in the skin. Specimens in good order have been deposited in the British Museum and with the Cambridge Philosophical Society by John Reeves, Esq. and the Rev. George Vachell, which show that the fish when alive is very handsomely and gaily ornamented.

Hab. The Indian ocean, China seas, and Malay archipelago. Macao.

GOBIOUS OMMATURUS, Richardson, Ichth. of the Voy. of the Sulphur, p. 146. pl. 55. f. 1. 3; *Icon.* Reeves, 147; Hardw. Chinese name, *Chang yaow* (Birch); *Chang yaou neen*, "Long-waisted" (Reeves); *Cheung in nain* (Bridgem. Chrest. 74). *Rad.* D. 9|–20; A. 1|17; C. 37; P. 22; V. 1|5–1|5, united.

A specimen in the British Museum, from John Reeves, Esq.

Hab. Macao.

GOBIOUS STIGMOTHONUS, Richardson, Ichth. of Sulph. p. 147.

Rad. D. 9|–1|13 vel 14; A. 1|11; C. 35; P. 18; V. 1|5–1|5, united.

Much like the last, and like it distinguished from the other Gobies by a greater number of rays than usual in the first dorsal. In this species that fin has a black mark. The Cambridge Philosophical Institution has two specimens, collected by the Rev. George Vachell.

Hab. Macao.

GObIUS LAGERSTROEMIANUS. *Gob. eleotris*, Lin. Amœn. Acad. Dec. 1754.

“*Rad.* B. 5; D. 11|–10; A. 9; C. 9! P. 20; V. 10.” (Lin.)

In the paper above quoted, which is entitled “*Chinensia Lagerstroemiana*,” Linnæus characterises a Goby in the following terms:—“*Lingua levis. Dentes parvi acuminati. Oculi a tergo capitatis. Radii pinnæ dorsi primæ acuminatis mollibus simplicibus. Pinnæ ventrales ferè infundibuliformes. Cauda integra, rotundata. Piscis totus una cum pinnis nebulosus.*” It seems to be allied to the preceding two species by the large number of rays in the first dorsal.

Hab. China.

GObIUS TANNOAO, Osbeck, *Voy. to China*, Engl. tr. i. p. 201. “*Rad.* B. 4? D. 11|–10; A. 13; C. 18; V. 12. funnel-shaped.” (Osb.)

Osbeck, in the account of his voyage to China, performed in 1751, but not published till 1757, and after his specimens had been examined by Linnæus, mentions a Goby, which is called *Tannoao* by the Chinese, and which he considers to be the same with the *G. niger* of Linnæus. This mistake is pointed out in the ‘*Histoire des Poissons*’ by M. Valenciennes (xiv. p. 16), but in quoting the rays of the first dorsal from Osbeck, there is a misprint of 1| for 11|. At page 188 of the volume of the work just quoted, this fish is suspected to be a variety of the *Periophthalmus kœbreuteri*; and it is possible that both this and the preceding species may actually belong to that genus. In the German translation of Osbeck’s ‘*Voyage*,’ this species appears to have been named *Apocryptes cantonensis* (C. et V. l. c.).

Hab. Canton.

GObIODES MELANURUS, Broussonnet (*Gobius*), MSS.; *Descript. of Anim.* p. 147. fig. 158. “*Rad.* D. 18; A. 9; C. 13; P. 14; V. 7.” (Id. l. c.)

The figure here quoted has a general resemblance to *Gobioides broussonneti* of Lacépède (C. et V. pl. 348), but the single dorsal and the anal occupy less space. The name of *Gobius melanurus* was written by Broussonnet himself over the figure, and he mentions the species by the same appellation in his first decade. The pectorals appear to be funnel-shaped, but their rays have most probably been incorrectly counted. The unknown author of the work gives us merely the following notice of the characters in addition to the numbers of the rays quoted above:—“Nearly cylindrical. Head roundish. One dorsal. Tail pointed with a black spot on the base of the fin” above the middle. “Eight inches long.”

Hab. “In Canton river. Eaten by the Chinese.”

APOCRYPTES SERPERASTER, Richardson. *Icon.* Reeves, β. 55; *Hardw.* 239. Chinese name, *Pih-shay*, “White snake” (Birch); *Pak hop*, “White frog” (Reeves); *Pak kop* (*Bridgem. Chrest.* 73). *Rad.* D. 6|–27; A. 27; C. 23; P. 23; V. 1|5–1|5, united.

This fish is very commonly carried about the streets for sale. Two specimens, now in the museum of the Cambridge Philosophical Institution, were brought from China by the Rev. George Vachell. They have less resemblance to Osbeck’s figure of *Apocryptes pectinirostris* than what is shown by a *Boleophthalmus*, obtained in the same seas by Mr. Vachell and noticed below. *A. serperaster* has a long pointed caudal, and scales sufficiently visible to the naked eye, but not ciliated, or only sparingly and deciduously so. A skinny preorbital lip. Three canines on each intermaxillary, and one interior one on each side of the symphysis below. Twenty-one side teeth on each limb of the upper jaw, and sixteen horizontal ones with incurved tips on each limb of the lower jaw. Five rays of first dorsal nearly of equal length, the sixth very short, and omitted in Reeves’s figure. The last ray of the second dorsal and anal divided to the base. Colour dirty wood-brown with darker patches at intervals. Paler and silvery on the sides and belly. The figure shows none of the spots or blue lines on the dorsals which exist in Osbeck’s *pectinirostris*. Length of the specimens 6 inches, of the caudal nearly 1½ inch. Length from snout to anus 2·2 inches.

Hab. Macao.

TRYPACHEN VAGINA, C. et V. xii. p. 153; *Icon.* Reeves, β. 57; *Hardw.* Acanth. 283. Chinese name, *Hung lae*, “Red lae” (Reeves, Birch, *Bridgem. Chrest.* 230).

Rad. B. 4; D. 6|41; A. 40; C. 17. (Spec. Mus. Haslar.)
 D. 6|42; A. 42; C. 17. (Spec. Mus. Brit.)
 D. 6|46; A. 46; C. 17. (Spec. Mus. Camb.)
 B. 4; D. 6|49; A. 1|45; C. 17. (Hist. des Pois.)

The fin-rays of this fish when shrivelled in spirits are counted with difficulty, but after much pains in examining a considerable number of specimens, I find the above variations without any other marked difference in form to indicate a plurality of species. Chinese examples have been brought to this country by John Reeves, Esq., Commander Dawkins, R.N., Sir Edward Belcher, Sir Everard Home, and the Rev. George Vachell.

Hab. The Indian ocean and China seas. (Hong Kong, Macao, Chusan, and Woosung at the mouth of the Yang tse kiang).

AMBLYOPUS RUGOSUS, Richardson. *Icon.* Reeves, β . 7; Hardw. *Acanth.* 282. Chinese name, *Shay king*, "Warp snake" (Reeves, who states that *king* signifies the warp of a web); *She kang* (Bridgem. Chrest. 231). *Rad.* D. 6|39; A. 40; C. 17; P. 17; V. 1|5-1|5, united.

Two Chinese species of this genus have been named by ichthyologists. One, the *Tænioide hermannien* of Lacépède, was originally described from a Chinese painting, and is most probably the *Shay king* of Mr. Reeves's portfolio, but as the specific name has been appropriated in the 'Histoire des Poissons' to an Indian fish, which is certainly distinct if Hamilton Buchanan's figure 9, pl. 5, be correct, confusion will be best avoided by giving it another name. Three specimens, brought from Macao by the Rev. George Vachell, exist in the museum of the Cambridge Philosophical Society, which are remarkable for the sharply-elevated, crenated, cuticular ridges on the face and lower jaw. Four of these ridges radiate from the eye as a centre, and five diverge from a spot on the cheek. These are connected by longitudinal ridges, and there are several less prominent and more distinctly porous ones on the gill-pieces. The lower jaw is crossed transversely by short ridges as prominent as those on the face. Neither from the figures nor descriptions of other species do we learn that they have facial ridges approaching to these in distinctness. The upper jaw shows about fourteen more or less acute compressed teeth in its circumference. The lower jaw is armed by about six teeth longer than the upper ones, and in both jaws there are several rows of much smaller, crowded, acute teeth, well-separated from the outer ones. The head is contained $7\frac{3}{4}$ times in the total length, the vent is rather behind the anterior third, and the caudal fin forms a ninth of the whole length. The dorsal fin is somewhat highest about the middle of the tail, where it rather exceeds half the height, and the anal, in which no spine could be detected, is half as high as the dorsal. The fins are fleshy, so that the rays are not to be counted without difficulty. Mr. Vachell's specimens and Mr. Reeves's figure have a contraction at the junction of the vertical fins, as if a string had been tied tightly round them, and it is probable that they are so usually carried by the fishermen. Ventrals spoon-shaped, with short stout spines. Scales very minute, deeply imbedded and distant from each other. Length, total 6.25 inches; of which the distance between mouth and anus is 2.38 inches, and the length of caudal 0.72 inch. Another specimen measures $8\frac{3}{4}$ inches, and a third $3\frac{3}{4}$ inches.

Hab. Macao.

AMBLYOPUS ANGUILLARIS, Lin.? (*Gobius*). *Rad.* D. 6|39; A. 37 vel 38; C. 17*.

Two specimens in the Cambridge Philosophical Society's museum, brought from Macao by the Rev. George Vachell, agree tolerably with the short characters given by Linnæus of his *anguillaris*, received from the same quarter. As compared with other *Amblyopi*, indeed the pectoral fins could not be said to be "*valdè parvæ*," but they may be so described in reference to the Gobies, with which Linnæus grouped this fish. The difference in the enumeration of the rays of the dorsal and anal will be lessened, if instead of twelve rays given to the caudal in the 'Systema Naturæ,' we reckon seventeen. This species is whitish or colourless in spirits, with translucent integuments, permitting the contents of the belly to shine through, and the fine membranes are more delicate, so that the rays can be more readily seen. The minute black eyes are easily seen on the white head. The caudal is larger and more lanceolate than in *rugosus*, and the pectorals longer and more acute. The porous lines on the face are scarcely elevated,

* There are either several species of *Amblyopus* in the Chinese waters, or the numbers of the rays differ in the same species. In the 'Descriptions of Animals,' which we already quoted, f. 15 represents an *Amblyopus*, which Broussonnet has considered as the *anguillaris* of Linnæus. The author enumerates the rays as D. 47; A. 42; P. 8; V. 6; and says that the fish dwells in the muddy banks of the river at Canton, and is eaten by the natives.

and the dentition differs from that of *rugosus*. There are four, five, or six slender cylindrical teeth on each limb of each jaw, rather acute, with brown tips, and not all of one length. The interior ones are in a single row, small and pearly, a few near the angle of the upper jaw being slightly larger. Length 4·30 inches, of which the caudal is 1·12 inch, the head 0·60 inch, and the length from mouth to vent 1·48 inch.

Hab. Macao.

PERIOPHTHALMUS MODESTUS, Cantor, *Annals of Nat. Hist.* vol. ix. p. 29.

“*Rad.* B. 2? D. 15|–1|12; A. 1|11; C. 13; P. 11; V. 1|5–1|5, united.”

“*P. brunneus, cinereo-marmoratus; abdomine albo-cærulescenti, alis pallide flavis; dorsali anteriori fasciis nigris duabus ornata; radiis alarum nigro-punctatis.*”

“*Hab.* Chusan, along the coasts of banks and canals.” (Cantor, *l. c.*)

BOLEOPHTHALMUS BODDAERTI, Pallas (*Gobius*), *Spic. Zool.* viii. p. 11. t. 2.

f. 4, 5; *Bl. Schn.* 66; C. et V. xiv. p. 199. *Gobius striatus*, *Bl. Schn.* 71.

t. 16. *Icon.* Reeves, β . 38; *Hardw. Acanth.* 295. Chinese name, *Hwa*

ya (Birch); *Fa yu* (Reeves); “Flower-fish;” *Tau* (*Bridgem. Chrest.* 77);

Icon. Reeves, *Hardw.* 291, 292, 293, & 294. *Descript. of Anim.* p. 150.

fig. 100. *Rad.* D. 5|–24 vel 26; A. 25 vel 26, &c. (*Spec. Brit. Mus.*)

Specimens, procured at Macao by John Reeves, Esq. and the Rev. George Vachell, are deposited in the British Museum and with the Cambridge Philosophical Society. Mr. Reeves’s figure omits the vertical bands which are conspicuous in his specimen, and are perhaps rendered more apparent by maceration in spirits; on the other hand, the brilliant pale-green specks on the body of the drawing are nearly effaced in the specimens. Distorted figures of this fish, with swollen gill-covers and a round open mouth, are drawn in its proper colours on the Chinese earthenware. Mr. Reeves’s figures 291, 292, 293 and 294, show the fish as used for this purpose.

Hab. Indian ocean, Malacca, Moluccas and China seas. Macao. At certain seasons it is hawked through the streets of Canton.

BOLEOPHTHALMUS PECTINIROSTRIS, Lin. (*Gobius*), *Chinensia Lagerstroem.*

Amœn. Acad. Dec. 1754. Osbeck, *Voy.* 1757. *Engl. transl.* p. 200. *Apocryptes chinensis*,

Osbeck, *Amœn. Acad.* iv. pl. 3. f. 3. *Ap. pectinirostris*,

C. et V. xii. p. 150. Chinese name, *Fay-ye* (Osbeck, *Eng. tr.*); *Fai-ja*,

(*French tr.*). *Rad.* D. 5|–25; A. 26; C. 21; P. 19; V. 1|5–1|5, united.

(*Cambr. spec.*)

A specimen brought from Canton by the Rev. G. Vachell and deposited in the Cambridge Philosophical Institution, corresponds with the few particulars mentioned in the passages regarding this species quoted above, except that the colours have suffered from long maceration in spirits, and can no longer be well made out. As the pectorals are mounted on an arm-like basis, though it is short and not bent, I have referred this fish rather to *Boleophthalmus* than to *Apocryptes*. The dentition does not seem to distinguish the two genera as established in the ‘*Histoire des Poissons*,’ at least I can perceive no essential distinction between the teeth of *Ap. dentatus* (C. V. xiv. p. 148) and of a *Boleophthalmus*. The rays of the first dorsal of *pectinirostris* are all filamentous, the central one being tallest and the others graduated. The membrane dark purple. Pectorals lanceolate. Ventrals small, infundibuliform. Fins generally tipped with wood-brown, and a diffused brownish spot on the second dorsal. Body brownish-gray, spotting effaced. Belly white. Scales very minute, the integument swelling over them like papillæ. Three canine teeth on each side of the symphysis of the upper jaw are followed by eighteen very minute lateral ones. Twenty-seven horizontal teeth with brownish truncated tips, which are not incurved, arm each limb of the lower jaw, and there is a stronger interior tooth on each side of the symphysis. A small obtuse lobe projects from the preorbital lip behind the canines on each side. The eyes touch each other, and their upper lids are granulated. Length, total 2·80 inches; length of head 0·62, length of caudal 0·50 inch.

Hab. Canton.

BOLEOPHTHALMUS AUCUPATORIUS, Richardson, *Ichth. of Voy. of Sulph.*

p. 148. pl. 62. f. 1–4; *Descript. of Anim.* p. 149. fig. 99; *Icon.* Reeves, β . 53;

Hardw. Acanth. 295. Chinese name, *Kan ke pang*, “Pursuing fowl-staff”

(Reeves); *Kong kai pang* (*Bridgem. Chrest.* 72). *Rad.* D. 5|–26; A. 1|25

vel 27; C. 17; P. 21; V. 1|5–1|5, united. (*Spec. Coll. of Surg.*)

Examples of this species exist in the British Museum and in the collection of the Cambridge Philosophical Society, procured at Macao by John Reeves, Esq. and the Rev. George Vachell. The College of Surgeons also possesses specimens obtained at Woosung in the estuary of Yang tse kiang by Sir Everard Home. The species has much resemblance to the *Gobius viridis* of Buchanan Hamilton, pl. 32. f. 12 (*Boleophthalmus viridis* of the 'Histoire des Poissons,' xii. p. 213), in form and also in the spotting, but the colours differ, and the Indian fish has a higher profile. It is probably the species noticed from a Chinese painting in the 'Histoire des Poissons' (xii. p. 215) as bearing a resemblance to *B. histiophorus*.

Hab. China seas. Macao. Muddy places, Whampoa. Woosung.

BOLEOPHTHALMUS CHINENSIS, C. et V. xii. p. 215.

Described solely from a Chinese painting as having a high pointed first dorsal, and a gray body sprinkled with brown specks, and more scattered clusters of white and green points; also four deep gray bands on the bases of the pectorals.

Hab. Canton.

BOLEOPHTHALMUS SINICUS, C. et V. xii. p. 215.

Also described from a drawing. It is grayish-brown, dotted finely with the same, and marked by scattered green spots and points. The pectorals are tinged with orange.

Hab. Canton.

BOLEOPHTHALMUS CAMPYLOSTOMUS, Richardson. *Icon.* Reeves, β . 52; *Hardw.* *Acanth.* 290. Chinese name, *Peih kou kow*, "Bent-mouth dog" (Birch); "Broken-mouthed dog" (Reeves); *Mah hau kau* (Bridgem. *Chrest.* 71).

Of this fish we have seen no specimen, and it may eventually prove to be one of the preceding two species, but the colours and markings do not correspond with the little that is said of them. It is a less slender fish than the *B. auctupatorius*, and has a comparatively low first dorsal, with a shorter though acute caudal fin. It has a yellowish-brown colour above the middle line, with crowded darker specks of the same and a flesh-red tint below, also mottled on the flanks with darker purplish dots. The belly before the vent and the cheeks are unspotted. The base of the pectoral is dark, the ventrals and anal are ochraceous, and the other fins are pale gray or dilute broccoli-brown. A single black spot tips the second dorsal posteriorly.

Hab. Canton.

ELEOTRIS FLAMMANS, Cantor, *Ann. Nat. Hist.* ix. p. 29. "*Rad.* B. 6; D. 6|–1|10; A. 1|9; C. 15; P. 18; V. 1|5." (Cantor.)

"*E. superne violaceo-brunneus; alâ dorsali anteriori fasciis tribus undulatis violaceis, flammeo-marginatâ; posteriori fasciis undulatis quatuor nigris, radiis alarum aurantiacis, apicibus nonnullis flammeis, aliis nigris; alâ caudali violaceo-canescenti, fasciis tribus cæruleis, radiatorum flavorum apicibus flavis; alâ anali aurantiacâ, fasciis quinque nigris undulatis, radiatorum brunneorum apicibus nigris; alis ventralibus pectoralibusque pallidè violaceis, radiatorum flavorum apicibus nigris.*"

"*Hab.* Chusan, canals and estuaries." (Cantor, *l. c.*)

ELEOTRIS CANTHERIUS, Richardson. *Icon.* Reeves, 114; *Hardw.* *Acanth.* 279. Chinese name, *Neen yu* (Reeves); *Neen u* (Bridgem. *Chrest.* 76). *Rad.* D. 6|–9; A. 8; C. 14; P. 12; V. 1|5 (ex figurâ).

The ground colour of this fish is deep yellowish-brown with blackish-brown reticulations, corresponding in size to the scales, and defined above by a dark line running from the eye along the upper quarter of the height to the caudal. The areas of the meshes are paler. A short blackish bar runs backwards from the lower part of the eye to the preoperculum, and there are some crowded blackish-brown dots on the gill-plate. The dorsals, anals and ventrals have a pale neutral tint colour (bluish or pearl-gray). The first dorsal is crossed by three branching and undulating lines, and the second dorsal by eight pairs of blue waving lines. The anal and ventrals are marked along each ray by a crowded series of small blue arrow-heads or chevrons. The caudal is also marked with chevrons, but they are orange-brown and umber, and the ground tint of the fin corresponds with that of the body. The pectoral is wood-brown or buff, with blackish dots on the rays.

Hab. Macao.

PHILYPNUS SINENSIS, Lacépède (*Le bostryche chinois*), iii. p. 141. pl. 2. *Gobius sinensis*, C. et V. xii. p. 94. *Philypnus ocellicauda*, Richardson, Zool. Sulph. pp. 59 & 149. pl. 56. f. 15, 16; *Icon*. Reeves, β . 8; Hardw. Acanth. Chinese name, *Neou yu*, "Bird-fish" (Birch); *Oo yu*, "Black fish" (Reeves); *Ow yu* (Bridgem. Chrest. 7).

In the 'Zoology of the Voyage of the Sulphur' I have described and figured a Chinese specimen of this fish, which was presented to the British Museum by John Reeves, Esq., but I was not then aware that it had been previously named by Lacépède, who had merely seen a Chinese drawing of it. His designation is here restored in right of its priority.

Hab. Canton.

Tribus PERCINA.

Fam. CALLIONYMIDÆ.

CALLIONYMUS REEVESII, Richardson, Ichth. of Voy. of Sulph. p. 60. pl. 36; *Icon*. Reeves, 180; Hardw. Acanth.

Rad. D. 4|9; A. 8; C. 11; P. 19; V. 1|5. (Male.)

D. 4|9; A. 9; C. 10; P. 19; V. 1|5. (Females.)

Since I described a male of this species in the work above quoted, I have examined two examples brought from Macao by the Rev. George Vachell, which I consider to be females, and to justify my quotation of Mr. Reeves's figure as appertaining to this species. The latter drawing is a good representation of these specimens, except that it shows but a small portion of the black mark between the third and fourth rays of the comparatively low first dorsal, the fin-membrane of the individual placed before the Chinese artist having evidently been torn. Neither of the specimens has an anal tubercle: both of them have three recurved teeth on the upper side of the long preopercular spine, and one of them has moreover a strong basal tooth beneath pointing forwards, while the other has merely a slight indication of an under-tooth near the middle of the spine.

Hab. Hong Kong. Macao.

CALLIONYMUS JAPONICUS, Houttuyn, Stockholm Trans. 1790. p. 107; Bl. Schn. p. 40. "*Rad.* D. 4|10; A. 9; C. 10; P. 19; V. 5," *loc. cit.*

"*C. capitis spinâ simplici posticè interius serratâ, margine orbitalum elevato acuto, pinnâ dorsali primâ brevissimâ, oculo nigro notatâ, pinnis nigro maculatis, caudali valdè elongatâ.*" (Schn.) I strongly suspect that Houttuyn's fish is identical with that which I have considered to be the female of *C. reevesii*, though the caudal fin is longer than in Mr. Vachell's specimens, and shorter than that of the male figured in the 'Ichthyology of the Voyage of the Sulphur.'

Hab. Japan.

CALLIONYMUS PUNCTATUS, Langsdorff, Mus. Berol. *C. japonicus*, C. et V. xii. p. 299.

M. Valenciennes considers a Japanese *Callionymus*, deposited by M. Langsdorff in the museum of the University of Berlin, to be specifically the same with the *C. japonicus* of Houttuyn noticed above, but as he states that M. Langsdorff's fish has a curved preopercular spine, with three spreading upper spinous teeth turned forwards (*en patte d'oie*), this can scarcely be reconciled with the description of the spine of *japonicus*. *C. punctatus* has a small tooth on the hinder part of the orbit which does not exist in *C. reevesii*.

Hab. Japan.

CALLIONYMUS HINDSII, Richardson, Ichth. of Voy. of Sulphur, p. 64. pl. 37. f. 3, 4.

A Macao specimen of this fish was presented to the Cambridge Philosophical Institution by the Rev. George Vachell. It does not possess the post-orbital tooth of *punctatus*.

Hab. Pacific ocean (Sir E. Belcher). China seas. Canton (Vachell).

HOPlichthys LANGSDORFII, C. et V. iv. p. 265. t. 81.

Schlegel states, in the 'Fauna Japonica,' that the anatomy of this fish shows its real affinities to be with *Callionymus*. In the text of the 'Histoire des Poissons,' the initial *H.* of the generic name has been inadvertently omitted, but the word is correctly printed "*Hoplichthys*" in the table of contents at the beginning of the volume.

Hab. Japan.

Fam. URANOSCOPIDÆ.

URANOSCOPIUS SCABER, Lin., C. et V. iii. p. 287. *Rad.* B. 6; D. 3|1|12; A. 13; C. 10 $\frac{1}{4}$; P. 17; V. 1|5.

Sir Edward Belcher brought an Uranoscope from China, which on a careful comparison with a Mediterranean specimen of *scaber*, presented no difference of form. Its colours were effaced.

Hab. China seas.

URANOSCOPIUS ASPER, Temm. et Schlegel, Faun. Jap. Sieb. p. 26. pl. 9. f. 1; *Icon.* Reeves, 162 & 166; Hardw. Acanth. 87, 88. Chinese name, *Koh yu*, "Horned fish" (Reeves); *Koh u* (Bridgeman. Chrest. 39). *Rad.* B. 6; D. 5|12 vel 13; A. 13 vel 14; C. 11 $\frac{1}{4}$; P. 18; V. 1|5. (Spec. Bürger.)

This species is distinguished from the preceding, which it closely resembles, by having a tooth fewer on the under edge of the preoperculum and by other slight differences in form. I have had an opportunity of comparing Sir Edward Belcher's Chinese specimen of *scaber* above mentioned with one of Bürger's Japanese examples of *asper* belonging to the British Museum. The text of the 'Fauna Japonica' quotes the rays of *asper* as D. 5|11; A. 15, &c.; but a specimen in the museum of the Cambridge Philosophical Society, procured at Macao by the Rev. George Vachell, and Bürger's one authenticated by Schlegel, present the formula which we have given above. The last two rays of the dorsal and anal are approximated and may be reckoned as branches or separate rays, making the numbers 12 or 13 and 13 or 14, according to the way in which they are viewed.

Hab. South coasts of Japan and the coasts of China down to Canton.

URANOSCOPIUS BICINCTUS, Temm. et Schlegel, in Fauna Jap. Siebold, p. 26.

Hab. Japan.

URANOSCOPIUS INERMIS, C. et V. iii. p. 310. t. 65; Temm. et Schl. in Fauna Japon. p. 27.

Hab. Indian ocean and sea of Japan.

URANOSCOPIUS ELONGATUS, Temm. et Schl. in Fauna Jap. Sieb. p. 27. t. 9. f. 2.

Hab. Sea of Japan.

PERCIS PULCHELLA, Temm. et Schl. in Fauna Jap. 24. t. 10. f. 2. "*Rad.* B. 6; D. 5|22; A. 1|17; C. 16; P. 15; V. 1|5." (Fauna Japon.)

A specimen collected by the Rev. George Vachell exists in the museum of the Cambridge Philosophical Institution, which ought, I think, to be referred to this species, though its fin-rays are as follows:—*Rad.* B. 6; D. 5|20; A. 16; C. 13 $\frac{3}{8}$, &c. The caudal fin has the second long ray from the top lengthened as in *pulchella*; there are four rows of white spots on the anal; and the streaks on the head are nearly as exhibited in the 'Fauna Japonica,' particularly a black crescentic mark behind each eye. The dots on the dorsal are mostly effaced.

I have some suspicion of the Japanese fish being merely a variety of the *Percis nebulosa* (C. et V. iii. p. 260), and that the *Dentex fasciatus* (Solander, Pisces Australiæ), or *Percis emeryana* (Richardson, Icones Piscium, t. 1. f. 1), is another variety; in which case the fish inhabits the ocean from Japan down to Australia.

Hab. Japan and China.

PERCIS SEXFASCIATA, Temm. et Schl. Fauna Jap. p. 25.

Hab. Japan.

It appears to me that the peculiar forms of the rays of the anal, as well as of some of the other fins, and many other particulars of structure, ally this group more closely to the *Triglidæ* than to the *Percidæ*. The *Trachinus vipera* has the suborbital united by a bony bridge to the upper limb of the preoperculum, and other members of the group show more or less of that projection of the suborbital chain which characterizes the following family.

Fam. COTTIDÆ.

SYNANCEIA EROSA, Langsdorff, C. et V. iv. p. 459. t. 96; Temm. et Schl. Fauna Jap. Sieb. p. 45. t. 16. f. 1.

Hab. Japan.

APLOACTIS ASPERA, Temm. et Schl. in Fauna Jap. Sieb. p. 51. t. 22. f. 3 et 4 ; Richardson, Ichth. of Voy. of Sulphur, p. 72.

This fish appears to have been first noticed by Tilesius on the Japanese coast. See Pallas, 'Zoogr. Rossica,' p. 129, note to *Cottus villosus*.

Hab. Seas of Japan.

APLOACTIS BREVICEPS, Richardson (*Synanceia*), Ichth. of Voy. of Sulphur, p. 71.

Mr. Reeves presented one specimen to the British Museum, and the Rev. George Vachell three to the Cambridge Philosophical Society.

Hab. Sea of Macao.

PELOR JAPONICUM, C. et V. iv. p. 437. t. 93 ; Temm. et Schl. F. Japon. Sieb. p. 44. t. 18. f. 2 ; *Icon.* Reeves, 140 ; Hardw. Acanth. 119. Chinese name, *Meow yu* (Birch) ; *Maou yu* (Reeves), "Cat fish ;" *Mau u* (Bridgem. Chrest. 181). Japanese name, "*Oniogose*" (Fauna Jap.). *Rad.* D. 17|6 ; A. 2|10 ; C. 11½ ; P. 10 et 2 ; V. 1|5. (Spec. Bürger).

Two specimens of this fish exist in the British Museum ; one of them brought from Canton by John Reeves, Esq., and the other sent by Bürger from Japan to Berlin, whence it was transferred to England. Mr. Reeves's fish differs from the Japan one in having eight soft rays in the dorsal with much smaller white spots on the body and fins. Although the 'Fauna Japonica' contains the following passage, "*l'anal a douze rayons et point d'épineux*," we have found two pungent anal rays in Bürger's specimen which was named at the Berlin Museum.

Hab. Seas of Japan and China.

PELOR AURANTIACUM, Temm. et Schl. Fauna Jap. p. 44. t. 18. f. 1. Japanese name, *Kiwogose*.

Hab. Seas of Japan.

PELOR CUVIERI, Gray, Hardw. Illustr. ; Richardson, Ichth. of Voy. of Sulph. p. 72. pl. 39 ; *Icon.* Reeves, 164 ; Hardw. Acanth. 124 & 125. Chinese name, *Hwang-yu*, "Yellow panther-fish" (Birch) ; *Wong paou yu*, "Yellow-spotted fish" (Reeves) ; *Wong pau u* (Bridgem. Chrest. 179).

The British Museum is indebted to John Reeves, Esq. for a specimen of this fish. The low ridge connecting the posterior edges of the orbits is straight, while in *Pelor japonicum* it bends forwards.

Hab. Canton.

PELOR SINENSE, C. et V. ix. p. 468.

Hab. Canton.

PELOR TIGRINUM, Richardson. *Icon.* Reeves, β . 42 ; Hardw. Acanth. 118. Chinese name, *Laou hu yu*, "Old tiger-fish" (Birch) ; *Laou hoo yu*, "Tiger-fish" (Reeves) ; *Lo tu yu* (Bridgem. Chrest. 177).

The Cambridge Philosophical Institution possesses a specimen which was procured by the Rev. George Vachell at Canton, and is correctly represented by Mr. Reeves's figure, except in the dorsal fin. In this the first three dorsal spines are a little separated from the others, and the coarse membrane of the rest of the fin is notched to half the depth of each spine and forms a thick lobulet to every tip. The soft dorsal is crossed obliquely by a dark brown bar, and there are three approximating brown bars on its base, which also cross the posterior spinous rays obliquely. The caudal has a brown membrane, and its rays are ringed by about six white marks alternating with brown ones. The body is brown with whitish spots more mottled than in the figure, and the intermediate spaces are paler. The form of the head is well rendered, and fringed barbels depend from almost every salient point. Two small ones hang from the chin, and a large one with a basal branchlet from the middle of each limb of the lower jaw. A thin smooth transverse ridge unites the orbits behind ; there is a compressed knob behind each eye, and three knobs flank the nape on each side and include three rays of the dorsal. The lateral preocular depressions are deep. A short, stout, and not very pungent preopercular spine can be felt through the skin.

Hab. Canton.

APISTES ALATUS, C. et V. iv. p. 392; Temm. et Schl. F. Jap. p. 49. *Trigla worra-minou*, Russell, 159; *Icon. Reeves*, 169; *Hardw. Acanth.* 136.

I have seen no Chinese examples of this fish, but Mr. Reeves's figure, notwithstanding the omission of the suborbital and preopercular spines, agrees so well with Russell's, that I have no hesitation in referring them both to the same species. The Chinese drawing shows a silvery head, a pale orange-brown body, black pectorals, a large black patch on the spinous dorsal with gray mottlings on the rest of the fin; five dark bars on the soft dorsal, as many on the caudal, and two incomplete ones on the anal. Ventrals pinkish, spotless.

Hab. Seas of China and Japan, and the Indian ocean.

APISTES TRACHINOIDES, C. et V. xii. p. 401. t. 92. *Rad. D.* 3|–12|4; *A.* 3|4; *C.* 12; *P.* 9 et 4; *V.* 1|4.

A Chinese specimen, collected by the Rev. George Vachell, exists in the museum of the Cambridge Philosophical Society, and the collection of Sir Edward Belcher contains another example, which is most probably also from the China seas. They agree with the description and figure in the 'Histoire des Poissons,' except that there are four unbranched rays in the pectoral, and that the dark dorsal bands are prolonged across the body.

Hab. Javan and Chinese seas.

APISTES RUBRIPINNIS, Temm. et Schl. F. Jap. p. 49. pl. 22. f. 2.

Hab. Coasts of Japan.

APISTES LONGISPINIS, C. et V. iv. p. 408. *Apiste à longue épine*, Quoy et Gaimard, *Voy. de l'Astrol.* pl. 11. f. 4. *Rad. D.* 14|8; *A.* 3|5; *C.* 7 $\frac{6}{8}$; *P.* 11; *V.* 1|4. (*Spec. Mus. Brit.*)

The British Museum possesses Chinese specimens presented by John Reeves, Esq., and Indian ones received from General Hardwicke.

Hab. Indian ocean, the Moluccas and sea of China.

MINOUS WOORA, C. et V. xii. p. 421. *Trigla woora minoo*, Russell, 159, *A. Rad. D.* 10|11; *A.* 1|9; *C.* 11; *P.* 11; *V.* 1|5. (China spec.)

Dried examples abound in the Chinese boxes of insects, and there is one in the museum of the Cambridge Philosophical Institution preserved in spirits, which was brought from Canton by the Rev. George Vachell. I have not established their specific identity with the Indian fish from the want of specimens from the latter country.

Hab. The Mauritius, the Indian and China seas.

Fam. TRIGLIDÆ.

PTEROIS VOLITANS, Gmel. (*Scorpena*), C. et V. iv. p. 352. pl. 88. *Scorpena volitans*, Benn. Ceylon, pl. 1. *Scorpenè mahè*, Lacép. iii. p. 278, et ii. p. 290; *Icon. Reeves*, β . 1; *Hardw. Acanth.* 120; *Reeves*, 261; *Hardw. Acanth.* 121. Chinese name, *Kew yu*, or *Mow yu* and *King yu* (Birch, *Reeves*).

Mr. Reeves's figure β 1 was not done from the recent fish like his other drawings, but copied from a painting by Mr. Millet, in which the supra-orbital cirrhi had been omitted. The cirrhi under the eye were added when the fish figured in drawing 261 was procured.

Hab. Seychelles, Mauritius, Indian ocean and Archipelago, Javan sea and coasts of China: also Japan according to Lacépède. It is said to ascend into brackish or fresh water, and to be reared in ponds at Batavia.

PTEROIS LUNULATA, Temm. et Schl. *Fauna Jap.* p. 45. pl. 19; *Icon. Reeves*, 165; *Hardw. Acanth.* 123. Chinese name, *Lung seu yu*, "Dragon's beard-fish" (Birch, *Reeves*); *Lung su u* (Bridgem. *Chrest.* 178). "Japanese name, *Jamonakami*" (*Fauna Jap.*).

A specimen now in the museum at Haslar was obtained on the Canton coast by Sir Edward Belcher.

Hab. Coasts of Japan and China.

CHIRUS HEXAGRAMMUS, Steller (also *Hexagrammus asper*, MSS.). *Labrax hexagrammus*, Tilesius, Mém. de l'Ac. de Pétersb. ii. pl. 23. f. 3; Pallas, Zoogr. Ross. p. 284; Temm. et Schl. F. Jap. p. 53. pl. 23. "Japanese name, *Abramee*" (Fauna Jap.).

I have seen no representation of a *Chirus* in Chinese drawings, but the genus is not uncommon on both shores of the Northern Pacific. A species closely resembling this one, if not actually the same, inhabits the harbour of Sitka. (*Ch. denarius*, Richardson, Ichth. of Voy. of Sulph. p. 78. pl. 44. f. 2.)

Hab. Coasts of Japan and Kamtschatka.

CHIRUS AGRAMMUS, Temm. et Schl. (*Labrax*), F. Jap. p. 56.

Hab. Sea of Japan.

SEBASTES INERMIS, C. et V. iv. p. 346; Temm. et Schl. F. Jap. p. 47. pl. 21. f. 3 and 4.

Hab. Japan.

SEBASTES VACHELLII, Richardson. *Icon.* Reeves, 69?; Hardw. *Acanth.* 114? Chinese name, *Shih kow kung*, "Stony dog" (Reeves); "Rock-dog gentleman" (Birch); *Shih kow kong* (Bridgeman. 137).

In the museum of the Cambridge Philosophical Institution there is a small *Sebastes* which was brought from China by the Rev. George Vachell, that I have not been able to identify with any described species, neither am I confident that Mr. Reeves's figure ought to be referred to it; but it agrees better with it than with any other that I have seen.

Eyes approximated with elevated orbital plates and a ridge dividing the furrow between them. Three acute, falcate teeth on the edge of each orbit, three larger ones behind the orbit, and a small one on the temples. Nasal spines small and acute. Under edge of the pre-orbital straight, ending in a spinous tooth pointing backwards. A thin unarmed ridge is continued from this tooth across the cheek to the root of the preopercular spine, where it is met by another ridge coming from the under edge of the orbit. These converging lines or ridges enclose a smooth disc, the rest of the cheek being scaly. Operculum armed by two small, flat spinous points and three angular corners. Opercular spines flat, weak and small, with no visible ridges extending from their roots. Gill-cover scaly. Maxillaries and jaws without scales. Angular ridges and points of the supra-scapulars and supra-axillary plate of the coracoid bone neither strong nor conspicuous. Scales of the body small, oblique and ciliated. Colours of specimen faded. From the uncertainty of the drawing belonging to this species I do not describe its tints in connection with it.

Hab. Canton.

SEBASTES PACHYCEPHALUS, Temm. et Schl. F. J. p. 47. pl. 20. f. 3; *Icon.* Reeves, 218; Hardw. *Acanth.* 115. Chinese name, *Shih gaou yu*, "Proud stone-fish" (Reeves). *Rad.* D. 13|12; A. 3|6; P. 7 et 12, &c.

A specimen exists in the Chinese collection at Hyde Park. The colours are not described in the 'Fauna Japonica;' but the following are the leading tints exhibited in Mr. Reeves's figure:—The body generally is brownish-red, paler and more lively on the under parts, and very dark towards the dorsal line. It is dotted throughout by darker points, apparently one to each scale, and there are several large, pale or bluish round spots on the sides. The head above and on the cheeks is like the body, and beneath it is unspotted. A crimson or reddish-orange is the general tint of the vertical fins, which, except the anal, have also two or three rows of dark round spots. The pectorals are orpiment and reddish-orange, with rows of black dots on the upper or branching rays. The ventrals are reddish-orange without spots.

Hab. Seas of China and Japan.

SEBASTES LONGICEPS, Richardson. *Rad.* D. 13|10; A. 2|6; P. 17; V. 1|5.

In the boxes of insects which are brought from China I have found examples of two species of *Sebastes* which appear to be undescribed. One of them has some resemblance to *S. pachycephalus*, but differs from it, and the rest of its congeners, in the greater comparative length of its head, which is contained twice and a half in the total length of the fish, caudal included. The nasal spines are very small, and there are three small teeth on the slightly raised upper edge of the orbit, four or five minute serratures in its middle part, and three larger jagged teeth at its posterior corner. The two low, rounded intra-orbital ridges are separated from each other by a narrow mesial furrow, and the whole space between the eyes does not

exceed two-thirds of the diameter of the orbit. The ridge which flanks the top of the cranium is a regular saw with five teeth; but the temporal ridges, though equally prominent, are more irregularly toothed. A low, thin, irregularly incised edge crests the infra-orbital ridge, and three minute teeth arm the posterior edge of the preorbital. The preopercular spine is very short, and is not bigger than the compressed tooth which overlies it. Only two teeth or angular corners exist on the edge of the bone below the spine. The operculum shows the usual two low ribs ending in short spinous points, but there are no serratures on the suboperculum, interoperculum or lower jaw. Small scales cover the top of the head to the nostrils, the cheek and gill-covers; but none can be detected on the maxillaries, which are most probably scaleless in the recent fish. The scales are minutely toothed on the edge.

Hab. China.

SEBASTES SERRULATUS, Richardson. *Rad.* B. 7; D. 13|11; A. 3|5; C. 144.

This *Sebastes*, also discovered in an insect-box, is not armed on the head by rows of spines like others of the genus, but presents in place of them very low, thin and serrated crests. A low double crest skirts the upper edge of the orbit, and is followed on each side of the cranium by a rather higher single one. Two ridges, nearly as high as the edges of the orbit, run forward between the eyes to the nostrils, their tips being the only substitutes for the usual nasal spines. The small preorbital has an irregular but obscurely stellate cancellated disc, with two small descending spinous teeth on its under edge. The second suborbital, which crosses the cheek, shows two thin, finely serrated crests that include a rugose disc. The edge of the preoperculum is serrated throughout, but it is only by aid of a lens that a minute spine can be detected at its angle, and clusters of spinous points on the usual sites of the four angular corners. The temples are roughly bony, and each limb of the lower jaw is traversed by three serrated crests higher than the cranial ones. A triangular operculum ends in a minute spinous point*, the suboperculum being prolonged beyond it to a fine tip. A few crenatures exist on the suboperculum where its edge meets the interoperculum.

Top of the head nearly on a line with the back, the orbits being close to the profile, but not elevated. The interorbital space exceeds half the diameter of the orbit in breadth, and is scaly between the ridges. Scales cover the whole side of the head except the ridges, and also the disc of the maxillary, and like those which cover the body, they are coarsely ciliated. Minute villiform teeth arm the jaws and the very small acute chevron of the vomer; but the palate bones appear to be toothless. This points to a generic difference from *Sebastes*. Many of the rays have been mutilated and the specimen is otherwise much injured, so that we cannot complete the description. The dorsal spines are slender, moderately tall, and grooved on the sides. The first two are contiguous to each other, and the penultimate one is much shorter than the last one. The pectorals reach to the beginning of the anal fin; and the third anal spine is one-fourth longer than the second one. The head forms nearly a third of the entire length, which in our specimen is 4 inches.

Hab. Sea of China.

SEBASTES MARMORATUS, C. et V. iv. p. 345; Temm. et Schl. F. J. 46. pl. 21. f. 1 and 2.

The British Museum possesses one of Bürger's specimens, which I have not been able to identify with any of Mr. Reeves's drawings.

Hab. Japan.

SEBASTES ALBO-FASCIATUS, Lacépède (*Holocentrus*), iv. p. 372; C. et V. iv. p. 344.

The authors of the 'Fauna Japonica' consider this to be merely a variety of *marmoratus*.

Hab. Seas of China and Japan.

SEBASTES SINENSIS, McClelland, *Calcutta Journ. Nat. Hist.* iv. p. 397. pl. 21. f. 3.

Mr. McClelland thinks that this may belong to the preceding species. His figure differs in profile from that of *S. marmoratus* in the 'Fauna Japonica.'

Hab. Chusan.

SCORPÆNA CIRRHOSA, Thunberg (*Perca*), *Mém. de Stockh.* 14. pl. 7. f. 2.

* Most of the *Sebastes* and *Scorpænae* have their bony operculum strengthened by two diverging ribs, whose points are spinous. In this species a vestige of a single rib only can be detected.

An. 1793; C. et V. iv. p. 318; Temm. et Schl. F. J. p. 42. pl. 17. f. 2, 3.
 “Japanese name, *Oiarakabu*.”

The British Museum possesses one of Bürger's Japanese specimens.

Hab. Indian ocean and sea of Japan.

SCORPÆNA NEGLECTA, Temm. et Schl. F. J. p. 43. pl. 17. f. 4. *Rad.*

D. 12|9; A. 3|5; C. 11; P. 9 et 11; V. 1|5. (Fauna Jap.)

D. 12|10; 3|5; 13 $\frac{5}{8}$; P. 8 et 8; V. 1|5. (Dried spec.)

To this species I am inclined to refer five or six small specimens which I picked out of the China insect-boxes, chiefly because they have a black spot between the seventh and ninth dorsal rays. The spines, intra-orbital ridges, &c., correspond with the descriptions and figure in the ‘Fauna Japonica;’ but the length of the lower preorbital, which almost equals that of an *Apistes*, is not noticed in that work. The specimens are much damaged, though the barbel between the posterior superciliary spines is still visible. The cheek is not scaly, and in this the species differs from the *Scorpæna militaris* (Ichth. Ereb. and Terr.) of Van Diemen's Land, which in most other respects it closely resembles. Edge of the palate-bones and chevron of the vomer set with teeth. Scales finely ciliated.

Hab. Coasts of China and Japan.

SCORPÆNA LEONINA, Richardson. *Icon.* Reeves, 66; Hardw. Acanth. 116.

Chinese name, *Shih sze tsze*, “Stone-lion,” such as are placed before houses (Birch); “Stone-lion's whelp” (Reeves); *Shih tz tsz* (Bridgem. Chrest. 116).

This species much resembles a *Platycephalus*, in the flatness of its head and the manner in which the rows of its strong spines are tiled upon each other. A pretty tall-feathered barbel rises from the posterior third of the orbit, and there are many others on the lower jaw and under corner of the maxillary and preoperculum, also numerous small ones on the flanks. The ground tint of the sides, which is reddish-brown, is clouded by largish masses of dark amber, the belly being paler and the summit of the back dark. The vertical fins are irregularly and obliquely barred with amber, and the pectorals are marked also by three cross bars formed by umbrine spots on the rays. Iris and tip of the caudal reddish. These particulars are noted solely from Mr. Reeves's figure. A specimen of the fish exists in the Chinese collection at Hyde Park, but I have not as yet examined it.

Hab. Canton.

CENTRIDERMICHTHYS UNCINATUS, Temm. et Schl. (*Cottus*), F. J. p. 38;

Richardson, Ichth. of Voy. of Sulph. p. 74. pl. 54. f. 6–10 (*C. ansatus*).

Rad. B. 6; D. 8|–19; A. 17; C. 9 $\frac{0}{11}$; P. 17; V. 1|4.

It is very probably a fish of this genus, which was observed by Steller at Cape Cronok and the mouth of the Itschia, and named by him *Cottus villosus* (Pall. Zoogr. Ross. p. 129). He states that it has three barbels on the lower jaw, and compares it to a *Platycephalus*, which *Centridermichthys* in fact considerably resembles. Tilesius, on the other hand, seems to have mistaken for *Cottus villosus* the *Aploactes aspera* noticed above, which is by no means like a *Platycephalus*.

Several specimens of *Centridermichthys uncinatus*, procured at Woosung in the estuary of the Yang tsee kiang kew by Sir Everard Home, were presented by him to the College of Surgeons. Another species inhabits the American coasts on the opposite side of the Pacific, viz. *C. asper* (Richardson, Fauna Boreal. Amer. pl. 95. f. 1).

Hab. China seas.

HEMILEPIDOTUS TILESII, C. et V. iv. p. 276. t. 85. *Cottus hemilepidotus*,

Tilesius, Mém. de Pétersb. iii. p. 262. pl. 11. *Cottus trachurus*, Pallas, Zoogr. Ross. p. 138.

Hab. Japan, Sagalien, sea of Ochotsk, Kurile islands and north-western shores of America.

PLATYCEPHALUS INSIDIATOR, Bloch, Schn. p. 59. *P. spatula*, id. p. 59.

Batrachus indicus, id. p. 43. *Callionymus indicus*, Lin. *Cotte made-casse*, Lacép. iii. p. 248. pl. 11. f. 1, 2. *Pl. insidiator*, C. et V. iv. p. 227; Temm. et Schl. F. J. p. 39. pl. 15. f. 1; *Icon.* Bl. pl. 424; Russell (*Irrwa*), pl. 46.

The Rev. George Vachell brought a specimen from Canton, which is now in the museum of the Cambridge Philosophical Society.

Hab. Red sea, Indian ocean, Moluccas, and seas of China and Japan.

PLATYCEPHALUS GUTTATUS, C. et V. iv. p. 224; Temm. et Schl. F. J. p. 39. pl. 15. f. 2; *Icon.* Reeves, 65; Hardw. Acanth. 110. Chinese name, *Sha kea* (Birch); "Pebble armour" (Reeves); *Sha kap* (Bridgem. Chrest. 40). Japanese name, *Notschi* (Langsdorff); *Onigotschi* (Fauna Japonica).

A Canton specimen of this fish exists in the museum of the Cambridge Philosophical Society, to which it was presented by the Rev. George Vachell.

Hab. Coasts of China and Japan.

PLATYCEPHALUS CULTELLATUS, Richardson. *Icon.* Reeves, β . 28; Hardw. Acanth. 109. *Rad.* D. 1|7|13; A. 13, &c. (Figure.)

Mr. Reeves's drawing here quoted resembles no figure of a *Platycephalus* with which I am acquainted, nor does it correspond to any of the numerous species described in the 'Histoire des Poissons.' It is remarkable for the length of its flat head, which forms nearly a third of the total length. Its small eyes are placed far forward and almost two diameters apart. Their orbits and the buccal ridges are unarmed. The cranial ridges (two on each side) are armed by a series of recumbent spines without any of the parallel or diverging lines which exist on the same parts in *P. insidiator*. The preopercular spines are equal, or the upper one rather exceeds the other. There are no spines on the lateral line. The colour of the fish, as is usual in the genus, is brownish, with numerous darker specks on the head, shoulders, pectoral and ventral fins. The body is without spots, but the back is crossed down to the lateral line by four deep brown bars, one under the first dorsal, two under the second, and the fourth behind the latter fin. The caudal is marked by five bars, the outer pair on each side being oblique; but there are no markings on the dorsals and anal. In the number of bars on the back this figure agrees with the *Pl. crocodilus* of Krusenstern, pl. 59. f. 2, which I have not as yet had an opportunity of consulting. In the 'Histoire des Poissons' and 'Fauna Japonica,' Krusenstern's plate is conjectured to be a bad representation of *Pl. guttatus*, from which Reeves's well-executed drawing is decidedly distinct.

Hab. Canton.

PLATYCEPHALUS JAPONICUS, Tilesius, Krusenst. Atlas, pl. 56. f. 1; C. et V. iv. p. 256; Temm. et Schl. F. J. p. 40. pl. 16. f. 3.

Sir Edward Belcher brought a specimen of this fish from the China seas.

Hab. Seas of Japan and China.

PLATYCEPHALUS ASPER, C. et V. iv. p. 257. pl. 82; Temm. et Schl. F. J. p. 40. pl. 16. f. 4, 5.

The same officer brought two examples of this fish from the same quarter.

Hab. Seas of Japan and China.

PLATYCEPHALUS SPINOSUS, Temm. et Schl. F. J. p. 40. pl. 16. f. 1, 2; *Icon.* Reeves (non Hardw.).

I obtained a Chinese specimen of this fish from the insect-boxes above mentioned.

Hab. Seas of Japan and China.

PLATYCEPHALUS ENDRACHTENSIS, Quoy et Gaimard, Voy. de Freyc. p. 353; C. et V. iv. p. 240.

We have compared a specimen of this fish, which was taken at Chusan by Dr. Cantor, with one obtained on the north-west coast of Australia by Surgeon R. A. Bankier, R.N., and can detect no difference whatever, except that the two preorbital teeth are less prominent in the Chinese specimen, which is smaller. The species is perhaps the most depressed of the *Platycephali*.

Hab. Seas of China and Australia.

In the 'Histoire des Poissons' the *Siluris imberbis* of Houttuyn (Mém. de la Soc. de Harlem, t. xx. p. 338), or the *Centranodon* of Lacépède, is shown to be a *Platycephalus*, and it is almost certainly one of the species above enumerated, but the description does not enable us to determine which of them.

BEMBRAS JAPONICUS, C. et V. iv. p. 283. pl. 83; Temm. et Schl. F. J. p. 41. pl. 16. f. 8.

Hab. Japan.

BEMBRAS CURTUS, Temm. et Schl. F. J. p. 48. pl. 16. f. 6, 7.

Hab. Japan.

ASPIDOPHORUS SUPERCILIOSUS, C. et V. iv. p. 215. *Cottus et Phalangistes japonicus*, Pall. Spic. p. 31. pl. 5. *Agonus japonicus*, Bl. Schn. 105.

Hab. Sea of Japan, northward to the Kourile Islands.

ASPIDOPHORUS ROSTRATUS, Tilesius (*Agonus*), Mém. de l'Acad. de Pétersb. iv. pl. 14; C. et V. iv. p. 212. *Phalangistes fusiformis*, Tilesius in Pallas' Zoogr. Ross. iii. p. 116.

Hab. Sea of Japan. Gulf of Aniva. Sagalien. Kourile islands.

ASPIDOPHORUS LÆVIGATUS, Tilesius (*Agonus*), Mém. de Pétersb. iv. p. 436; C. et V. iv. p. 214. *Syngnathus segaliensis*, Tilesius, Mém. de la Soc. Imp. de Moscou, ii. p. 216. pl. 14.

Hab. Jesso.

Three other *Aspidophori* inhabit the coasts of Kamtschatka, Sagalien, or the Kourile Islands.

COTTUS INTERMEDIUS, Temm. et Schl. F. J. p. 38.

Hab. Jesso.

The sea of Ochotsk nourishes five other *Cotti*, viz. *C. minutus*, *jaok*, *stelleri*, *mertensii* and *marmoratus*, all noticed in the 'Histoire des Poissons.'

PERISTEDION ORIENTALE, Temm. et Schl. F. J. p. 37. pl. 14. f. 5, 6.

Hab. Japan.

DACTYLOPTERUS ORIENTALIS, C. et V. iv. p. 134. pl. 76; Temm. et Schl. F. J. p. 37.

Hab. Seas of Japan and China. Specimens are frequently to be found in the Chinese insect-boxes.

TRIGLA BURGERI, Temm. et Schl. F. J. p. 35. pl. 14. f. 1, 2; *Icon.* Reeves, β . 3; Hardw. Acanth. 106. Chinese name, *Hung keo*, "Red horn" (Reeves, Birch); *Hung koh* (Bridgem. Chrest. 79).

It forms a part of almost every collection of Chinese fish that we have seen.

Hab. Coasts of China and Japan. Hong Kong.

TRIGLA PAPILIONACEA, Solander, Pisces Australiæ, ined. p. 23; *Icon.* Parkinsonii in Bib. Banks, ii. t. 104. *Trigla kumu*, Less. et Garnot, Voy. de la Coquille, pl. 19; C. et V. iv. p. 50; Temm. et Schl. F. J. p. 37; *Icon.* Reeves, 159; Hardw. 107. Chinese name, *Lan yih yu*, "Green wing or fin" (Birch); *Lam e yu*, "Blue-finned fish" (Reeves); *Lam yih u* (Bridgem. Chrest. 78).

We have compared the Chinese and Australian specimens.

Hab. Seas of Japan, China, New Zealand, Van Diemen's Land, and the Cape of Good Hope.

TRIGLA HEMISTICTA, Temm. et Schl. F. J. p. 36. pl. 14. f. 3, 4. *Trigla alata*, Houttuyn, Mém. de la Soc. de Harlem, xx. p. 336?

The Haslar Museum possesses an example of this species, which was brought from China by Captain Dawkins, R.N.

Hab. Seas of China and Japan.

TRIGLA SPINOSA, M'Clelland, Calcutta Journ. Nat. Hist. iv. p. 396. pl. 22. f. 2.

Mr. M'Clelland's figure has a more sloping profile than that of *Tr. papilionacea*, and the fin-rays differ in number, otherwise there is nothing in his description to distinguish it from that species. It is not, as he is inclined to think, the *Tr. alata* of Houttuyn, since it wants the rostral spines.

Hab. Chusan.

Fam. POLYNEMIDÆ.

POLYNEMUS TETRADACTYLUS, Shaw, Zool.; C. V. iii. p. 375. *Trigla asiatica*, Lin. *P. quadrinarius*, Solander, Pisces Austr.; *Icon.* Parkinsonii in Bib. Banks, serv. 101. *Maga jellee*, Russell, 183. *P. teria*, Buchanan Hamilt. pp. 224, 381. *Icon.* Reeves, β . 29; Hardw. 91; Acanth. 93 & 94. Chinese

name, *Ma yew* (Reeves), "Salmon-fish" of the foreign residents (Reeves); *Ma yau* (Bridgem. Chrest. 105).

Hab. Indian ocean and rivers. Javan archipelago. Coasts of Australia and China.

Figure 242 of Mr. Reeves's collection (Hardw. 89) may represent the young of the preceding. It differs in having a more prominent belly and a shorter anal fin, though with as numerous rays as the anal of the preceding. It also wants the fine black lines which run through the centres of each row of scales above the lateral line, which are represented in the preceding figure. The four free pectoral rays have the same relative length.

POLYNEMUS PLEBEIUS, Broussonnet, Ichth. ; C. et V. iii. p. 380 ; Temm. et Schl. F. J. p. 29. pl. 11. f. 1. *P. lineatus*, Lacép. v. pl. 13. f. 2. *P. sele*, Buch. Hamilt. Ganges, p. 226 & 381. *Trigla asiatica*, Forst. Descr. Anim. p. 236 ; *Icon.* Georgii Forst. in Bib. Banks, serv. 241. f. 1.

Hab. Mauritius, Indian ocean, sea of Japan and Polynesia.

POLYNEMUS XANTHONEMUS, C. et V. vii. p. 517 ; *Icon.* Reeves, a. 15 ; Hardw. Acanth. 90. Chinese name, *Ma keaou lang* (Reeves) ; *Ma kau long* (Bridgem. Chrest. 114).

The figure has a zigzag blackish line above the base of the pectoral, which is not noticed in the 'Histoire des Poissons,' but in other respects it agrees with the description in that work.

Hab. Indian ocean and China sea. Canton.

Fam. MULLIDÆ.

UPENEUS CHRYSOPLEURON, Temm. et Schl. F. J. p. 29. pl. 12. f. 1 ; *Icon.* Reeves, 268 ; Hardw. Acanth. 98. Chinese name, *Hung te neaou* (Birch.) ; *Hong te new*, "Red-coated mullet" (Reeves).

This species is established in the 'Fauna Japonica' solely from a drawing of M. Bürger's, no specimen having reached the authors. Mr. Reeves's drawing is more elaborately coloured, and differs from that in the 'Fauna Japonica,' more in minute details than in general effect. The edges of the scales have an olive tint, and their discs are occupied by flexuose, red veins. The end of the snout, a circle round the eye, and the upper edge of the preorbital are of a brighter vermilion, as is also the gill-cover. A bluish streak marks the base of the pectoral.

Hab. China and Japan.

UPENEUS SUBVITTATUS, Temm. et Schl. F. J. p. 30. *Rad.* D 7|–1|9 ; A. 1|6 ; V. 1|5. (Camb. spec.)

I am inclined to refer to this species a fish presented to the Cambridge Philosophical Society by the Rev. George Vachell. Narrow villiform bands of fine short teeth arm the jaws, acute chevron of the vomer and the palate-bones. The limbs of the preoperculum meet in a right angle, the extreme corner being slightly rounded and crenated. The barbels reach to the edge of the gill-opening. Reticulated and strongly ciliated scales cover the body, and the thirty-two which compose the lateral line are each traversed by a tube having three short branchlets on its upper side and one below. The line passes the anal before its curve is complete. Most of the colours have perished, but two faint bars remain on the dorsal, one of the bars having a black spot in it. Length of fish, 4 inch. Height, 0.9 inch. Length of head, 0.95 inch.

Hab. Seas of Japan and China.

UPENEUS BIACULEATUS, Gray (J. E.), Cat. of the Brit. Mus. ; *Icon.* Reeves, a. 22 ; Hardw. Acanth. 101. Chinese name, *Fei te tseo* (Birch) ; *Fe te tso*, "Flying crying tso" (Reeves) ; *Fi tai tseuh* (Bridgem. Chrest. 228). *Rad.* D. 8|–9 ; A. 7 ; P. 14 ; V. 1|5.

An example of this species, brought from Canton by John Reeves, Esq., exists in the British Museum. It belongs to the tribe "without palatine teeth, and with the jaw-teeth widely set in a single row;" but it has no black spot on the tail. The very short anterior spine of the first dorsal is not represented in the figure. All the rays of the second dorsal and anal are jointed. Opercular spines conspicuous, the upper one being short and blunt, the lower one longer and acute. A dense bushy cluster is formed by the tubes on each scale of the lateral line. The barbels reach to the inferior part of the gill-opening, and the jaw-teeth are short-conical. Olive-green is the chief tint on the back and upper parts of the sides, deepest on the edges of the scales, whose discs, as they approach the flanks, acquire more and more of a pale reddish hue. These are so arranged as to form two indistinct longitudinal reddish stripes.

The belly is tile-red, while the fins have a colour approaching more to carmine, but the membranes of the ventrals and anal are mostly orpiment-orange. A dull reddish-brown tinges the front of the head, and a more lively carmine the lips and corners of the mouth. Along the middle of the olive-coloured preorbital there is a dark streak, and another marks out its lower edge. A peach-blossom red spot is placed on the top of the tail immediately behind the second dorsal.

Hab. Canton.

UPENEUS ^{indicus Shaw.} RUSSELLI, C. et V. iii. p. 465. *Rahtee goolivinda*, Russell, pl. 157. *Mullus indicus*, Shaw, Zool. iv. p. 614; *Icon.* Reeves, a. 36; *Hardw.* Acanth. 102. Chinese name, *Tsing fei te* (Birch); *Ching fe te* (Reeves). *Rad.* D. 9|-9; A. 1|7; C. 14 $\frac{4}{4}$; P. 16; V. 1|5. (Brit. Mus. spec.)

An injured specimen of this fish, procured at Canton by the Rev. George Vachell, exists in the museum of the Cambridge Philosophical Society, and there are two from the same place in the British Museum, presented by John Reeves, Esq., which differ from the drawing merely in the black spot on the top of the tail being a little further back. The species belongs to the same group with *biaculeatus*, which it resembles in figure, and the Chinese appellation is the same with a distinctive epithet added.

The first spine of the dorsal is very short and incumbent on the base of the second, while the last spine is very small, recumbent and not easily detected, so that only seven may be reckoned, unless on minute inspection. Joints exist at top of the first ray of the second dorsal, and the point of the anal spine is flexible. The operculum has two small spinous points, and its anterior border is striated. The scales are granular and reticulate on their outer margin, minutely pitted on the disc, and furrowed and granulated towards the base. Each scale of the lateral line is marked by a little torch, that is, a cluster of many simple or merely forked short branchlets supported on a thickish tubular stem.

The colours are pretty well described by Russell. In Mr. Reeves's figure a short blue line runs from the orbit to the nostril, another borders the preorbital beneath, and three descend from the temples to the cheek and gill-cover. The large anterior lateral spot is of a bright gamboge, and the posterior one is purplish-black. Five orange-coloured streaks cross the anal obliquely.

Hab. Indian and China seas.

UPENEUS BENSASI, Temm. et Schl. F. J. p. 30. pl. 11. f. 2. "Japanese name, *Bensasi*."

Hab. Seas of Japan.

UPENEUS TRAGULA, Richardson. *Icon.* Reeves, a. 21; *Hardw.* Acanth. 105. Chinese name, *Yang tswan*, "Ocean borer" (Birch); "Sea arrow" (Reeves); *Yéung tsün*, (Bridgem. Chrest. 229). *Rad.* D. 7. vel 8|-1|8; A. 1|6, &c.

This species is allied to *sub-vittatus*, *dubius* and others of the same group which have banded caudals. Mr. Reeves presented a Canton specimen to the British Museum, and I have received two from Surgeon R. A. Bankier, R. N., procured at Hong Kong. The short tubes on the scales of the lateral line are for the most part divided, and one of the branches is generally notched at the end, while the other emits very short transverse branchlets. The whole cluster on each scale looks to the naked eye to be merely a club-shaped tube. Narrow bands of minute, slender but bluntish teeth, arm the jaws and edges of the palate-bones, and there are still smaller ones on the chevron of the vomer. The barbels reach to the preoperculum. A more slender fish than *vittatus* and less so than *tæniopterus*. Blackish-green; upper half of the body traversed by a pale streak, commencing at the eye and coincident at first with the lateral line, but running above it in its course through the tail. Round purplish dots are distributed equally over the whole body, but are most conspicuous on the lower silvery parts. On the cheeks, the specks are dark umber, smaller and not round. The dorsals are darkish, especially towards their tips, with obscure bars in the specimens, and on the second the darker colour forms a large blotch. Six dark brown bars cross the caudal. The anal and ventrals are roseate with round dots, which are deep reddish-brown on the ventrals.

Hab. Canton.

UPENEUS DUBIUS, Temm. et Schl. F. J. p. 30. pl. 11. f. 3.

Hab. Seas of Japan.

There remains two of Mr. Reeves's figures, which we are unable to place in their proper groups from ignorance of their dentition. One of them, named *Yang chuey*, "Foreign mullet" (*Icon.* Reeves, a. 44; *Hardw.* 103), has the external form of *Up. bensasi*, which enters the first division of the genus, but it wants the bands and spots on the fins of that species.

The other (*Icon. Reeves, 250; Hardw. 104*) resembles *Up. bilineatus* of Quoy and Gaimard, in having two longitudinal streaks, but differs in its more oblique profile and greater number of fin-rays. Both these and the rest of the species figured by Mr. Reeves, were procured at Canton.

Fam. PERCIDÆ.

APOGON NOVEM-FASCIATUS, C. et V. ii. p. 154; Temm. et Schl. F. J. p. 2. pl. 2. f. 2; *Icon. Reeves, β. 9; Hardw. Acanth. 8.* Chinese name, *Hung so ho*, "Red-flowering water lily" (Reeves); *Hung soo ho* "Red-combed water-lily" (Birch).

Hab. Seas of Japan, China, the Moluccas, Java and Floris.

APOGON SEMILINEATUS, Temm. et Schl. F. J. p. 4. pl. 2. f. 2.

Hab. Sea of Japan.

APOGON LINEATUS, Temm. et Schl. F. J. p. 3.

Hab. Sea of Japan.

APOGON NIGRIPINNIS, C. et V. ii. p. 152; Temm. et Schl. F. J. p. 3.

Hab. Indian ocean. Seas of Java and Japan.

APOGON CARINATUS, C. et V. ii. p. 157; Temm. et Schl. F. J. p. 3.

Hab. Japan.

APOGON TRIMACULATUS, C. et V. ii. p. 156? Less. et Garnot, *Voy. du Du-perrey, p. 237?* *Icon. Reeves, 70; Hardw. Acanth. 9.* Chinese name, *Yang sun ho* (Reeves); *Yéng tsün* (Bridgem. *Chrest. 229*). *Rad. D. 7-19; A. 2|8; C. 16 $\frac{6}{8}$; V. 1|5.* (Chinese spec.)

Mr. Reeves has deposited the specimen from which his figure was drawn in the British Museum. It has the form of *Ap. trimaculatus*, but scarcely any traces are discernible of the three black dorsal spots, and the figure wants these spots entirely, having a bronzed amber colour on the back, with pale sides. The pectoral is orange, and the other fins brownish-purple, all without spots. The Chinese fish has a great similarity to *Ap. rex-mullorum*, but its body is a little higher. The spine of the second dorsal is strong. The preoperculum is serrated nearly all round, and the villiform bands of teeth on the jaws are shorter and finer than those of *Ap. rex-mullorum*.

Hab. Seas of Java? and China.

AMBASSIS VACHELLII, Richardson. *Rad. D. 7-19; A. 3|9; P. 13; V. 1|5.*

A Canton specimen of this fish, collected by the Rev. George Vachell, belongs to the Cambridge Philosophical Institution, which differs from the three noticed in the 'Histoire des Poissons,' that have no more than nine soft rays in the second dorsal, in having four teeth reclining backwards on the hinder part of the orbit. Scaly nape, convexly coped with an acute mesial line; the scales coming to a point between the posterior parts of the orbits. Gill-cover entire and scaly, a single row of large ones on the inter-operculum, which is also entire. Two acute edges of the lower limb of preoperculum beautifully serrated, and the posterior edge of the upper limb rather openly and slenderly toothed. The corner is rounded, and the fore-edge of the upper limb is vertical and smooth. Whole edge of the preorbital spinously toothed. Eye large; lower jaw ascending.

A recumbent, concealed pre-dorsal spine. The spines of the dorsal are curiously beaded, as if jointed; and the ventral spine also is torulose. The lateral line, composed of about thirty scales, is arched anteriorly in a brown band, which descends from the first dorsal, and is there diffracted and resumed two scales' breadth lower, whence it is continued in a silvery stripe to the tail. Length of fish, 2.50 inches. Height of body, 1.68 inch.

Hab. Canton.

DIPLOPRION BIFASCIATUM, C. et V. ii. p. 137. pl. 21; Temm. et Schl. F. J. p. 2; *Icon. Reeves, α. 27; Hardw. Acanth. 5.* Chinese name, *Hwang te yu*, "Hwang te's fish," named after one of the judges of Hades (Reeves); "Yellow emperor's fish" (Birch). *Rad. D. 8-15 ad 19; A. 2|12; C. 15 $\frac{5}{8}$; P. 16; V. 1|5.*

Specimens exist in every collection of Chinese fish, and small ones are common in the insect-boxes sold at Canton. Recent colour bright lemon-yellow, with spinous dorsal, ven-

trals and lateral mark black; also a very narrow edging of the same to the bright yellow vertical fins. The body is crossed vertically by upwards of twenty narrow bars, bent *en chevron*, and differing slightly from the ground tint.

Hab. Japanese, Chinese and Javan seas.

NIPHON SPINOSUS, C. et V. ii. p. 131. pl. 19; Temm. et Schl. p. 1. pl. 1. f. 1.

The British Museum possesses a specimen sent from Japan by Bürger.

Hab. Sea of Japan.

LATES NOBILIS, C. et V. ii. p. 96. pl. 13. *Pandooomenoo*, Russell, 131.

Coius vacti, Buchan. Hamilt. Ganges, pp. 86, 369. pl. 16. f. 28; *Icon.*

Reeves, a. 10; Hardw. Acanth. 7. Chinese name, *Tsao yu* (Birch);

Tso yu (Reeves); *Tso u* (Bridgem. Chrest. 166).

Mr. Reeves's specimen from Canton, deposited in the British Museum, and other examples in the Chinese collection at Hyde Park, agree exactly with Indian ones; but Mr. Reeves's figure is not so happy as the rest of his admirable drawings, being inexact in the numbers of the soft rays and in the anal spines.

Hab. Indian ocean and sea of China. Ganges. Canton. It is not mentioned in the 'Fauna Japonica.'

LATES CALCARIFER, C. et V. ii. p. 100; Bl. 244? *Icon.* Reeves, a. 11;

Hardw. Acanth. 64. Chinese name, *Hih tsaou* (Birch); *Hih tso*, "Black

tso" (Reeves); *Hak ts'o* (Bridgem. 128). *Rad.* D. 8|11; A. 3|8.

The figure in Mr. Reeves's portfolio above quoted, has the same defects with that of *Lates nobilis*, but a mounted specimen, brought by that gentleman from Canton and deposited in the British Museum, has the number of rays given above, and four teeth on the humeral bone. Its length is 10.25 inches, of which the head measures 2.50 inches. Bloch's figure is not accurate in the details. The lateral line in this species is more boldly arched above the pectoral than in *L. nobilis*.

Hab. Coasts of China.

The *Ta loo*, "Variegated —" (Reeves, 88), *Ta lo* (Bridgem. Chrest. 172), much resembles these *Lates* in form, but it has too many spines for any described species either of that genus or of *Labrax*. The Chinese generic epithet belongs to *Labrax*.

LABRAX JAPONICUS, C. et V. ii. p. 85. *Perca-labrax japonicus*, Temm. et

Schl. F. J. p. 2. pl. 2. f. 1. *Holocentrum maculatum*, M^cClelland, Calcutta

Journ. Nat. Hist. p. 400. pl. 21. f. 1. *Lates punctulatus*, Cantor, *fide spec.*;

Icon. Reeves, 135; Hardw. Acanth. 43. Chinese name, *Pan tsaou* "Striped

tsaou" (Birch); *Pan loo* (Reeves); *Páns lò* (Bridgem. Chrest. 217).

We have had an opportunity of comparing one of Bürger's Japanese specimens, now in the British Museum, with others from various parts of the Chinese coasts. Mr. Reeves's figure is that of the young fish. One Chinese specimen, said to have been transmitted to London by Mr. M^cClelland, is labelled *Lates punctatus*, but I do not know whether it has been published by that name or not. Specimens exist in the British Museum, India-House and Haslar museums, and in the Chinese collection at Hyde Park.

Hab. Seas of Japan and China. Hong Kong, Canton, Peiho, Chusan, &c.

Fam. BERYCIDÆ (Low Fishes of Madeira).

MONOCENTRIS JAPONICUS, Houttuyn (*Gasterosteus*), Mém. de Harlem, xx.

p. 329; C. et V. iv. p. 461; Bl. Schn. pl. 24; Temm. et Schl. F. J. p. 50.

pl. 22. f. 1. *Sciæna japonica*, Thunberg, Mém. de l'Acad. des Sciences

de Swede, xi. p. 102. pl. 3. *Lepisacanthæ*, Lacép. iii. p. 321.

Hab. Sea of Japan.

MYRIPRISTES JAPONICUS, C. et V. iii. p. 173. pl. 58; Temm. et Schl. F. J.

p. 22.

Hab. Sea of Japan.

MYRIPRISTES PRALINUS, C. et V. iii. p. 170 et vii. p. 486. *Rad.* D. 10|13; A. 4|11; C. 19 $\frac{2}{5}$; V. 1|7.

A Canton specimen was presented to the British Museum by John Reeves, Esq.

Hab. Coasts of China. Canton.

HOLOCENTRUM SPINOSISSIMUM, Temm. et Schl. F. J. p. 22; *Icon.* Reeves, 84; Hardw. Acanth. 84. *Holocentre à bande blanche*, Lacép. iv. p. 372, 373? Chinese name, *Tseuen Keun Keā*, "Tseang Keun's armour;" "Tseang Keun is a military officer" (Reeves); *Tseüng kwan káp* (Bridgem. Chrest. 93). *Rad.* B. 8; D. 11|13; A. 4|7, &c.

Mr. Reeves's Canton specimen is deposited in the British Museum. Lacépède, on the authority of Japanese drawings, named one species of this genus *Holocentre à bande blanche*, and another *Holocentre blanc-rouge*. On the supposition that the only two *Holocentra* which I have met with in collections of Chinese fish are the same two which frequent the seas of Japan, I have considered his *bande blanche* as identical with the *spinosissimum* of the 'Fauna Japonica,' because of its white stripes. Our enumeration of the fin-rays differs from that recorded in the work in question; but it is difficult in this genus, without dissection, to distinguish between entire rays and branches, especially of the anal fin, and two observers will scarcely reckon alike. Caudal and anal yellow, the front of latter and sides of former red. Edge of dorsal yellow.

Hab. Coasts of Japan and China.

HOLOCENTRUM ALBO-RUBRUM, Lacép. iv. p. 372; *Icon.* Reeves, a. 19; Hardw. Acanth. 83. Chinese name, *Kin lin kea*, "Scaly metallic armour" (Reeves); *Kam lun káp* (Bridgem. Chrest. 94). *Rad.* B. 8; D. 11|14; A. 4|9; P. 1|12, &c.

For the reason given above I have referred this Chinese fish to the species named by Lacépède. Specimens from Canton exist in the British Museum, presented by John Reeves, Esq., and in the museum of the Cambridge Philosophical Society, by the Rev. George Vachell. There are also examples of it in the Chinese collection at Hyde Park. Cuvier was inclined to think that the Japanese painting referred to by Lacépède, was a representation of *H. orientale*, but a careful examination of the specimens causes me to doubt the correctness of this opinion and to have recourse to Lacépède's prior appellation.

The infraorbital chain is finely fringed and unequally toothed throughout, the anterior point of the preorbital being armed by one strong curved tooth followed by five or six small conical ones, differing in appearance from the rest, which are more setaceous. Interoperculum armed by six or seven teeth, the posterior three being largest. Ribs or longitudinal streaks of operculum ending in four or five slender points; the two spines strong and slightly divergent. Vertical edge of preoperculum strongly toothed above the thick, smooth spine; under edge also toothed; the disc smooth. Under jaw and maxillaries streaked in two directions. Temporal plate streaked and toothed. Posterior frontal rusticated; from seven to ten striæ on each side of the hind head; supra-scapular and scapula finely toothed and furrowed. An acute tooth of the nasal bone overlies the edge of the intermaxillary; and there are streaks and a small tooth on the supra-axillary plate of the coracoid bone; thirty-seven scales on lateral line. There is none of the yellow colour on the fins which the preceding species shows.

Hab. Seas of China and Japan.

Fam. SILLAGINIDÆ.

SILLAGO JAPONICA, Temm. et Schl. F. J. 23. pl. 10. f. 1; *Icon.* Reeves, β . 40; Hardw. Acanth. 3. Chinese name, *Sha tswan*, "Sand spear" (Reeves); *Shá tsün* (Bridgem. Chrest. 202). *Rad.* B. 5; D. 11|-1|22; A. 3|21, &c.

John Reeves, Esq. and the Rev. George Vachell brought specimens from Canton, which are deposited in the British Museum and with the Cambridge Philosophical Institution. The numbers of rays, as given above, correspond with the figure but not the text of the 'Fauna Japonica.' They were reckoned in one of Mr. Vachell's specimens. The second spine of the first dorsal is rather taller than the first, and the curve of the lateral line is exaggerated in Mr. Reeves's drawing.

Fam. SCIÆNIDÆ.

SCIÆNA JAPONICA, Temm. et Schl. F. J. p. 58. pl. 54. f. 1.

Hab. Sea of Japan.

SCIÆNA LUCIDA, Richardson, Ichth. Voy. of Sulphur, p. 87. pl. 44. f. 3, 4; *Icon. Reeves*, β. 6; *Hardw. Acanth.* 130. Chinese name, *Hwang pe tow* (Birch); *Wang pe tow*, "Yellow-skin head" (Reeves); *Wang pi tau*, (Bridgem. Chrest. 98).

The *Sciæna lucida* forms part of all the collections of Chinese fish that we have examined, and is one of the most common fish on the breakfast tables of the foreign residents at Macao. *Wang pe* is the fruit of the *Cookia punctata*.

Hab. Seas of China. Chusan. Ningpo. Canton.

SCIÆNA CROCEA, Richardson. *Icon. Reeves*, 139; *Hardw. Acanth.* 131. Chinese name, *Hwang hwa* (Reeves); "Yellow paint" (Birch); (Bridgem. Chrest. 169?) *Rad. D.* 9|1|33; *A.* 1|8; *C.* 17 $\frac{1}{4}$; *P.* 16; *V.* 1|5.

This fish is intermediate in form, as well as in the numbers of its fin-rays, between *Sc. lucida* and *Sc. pama* (Buch.), and differs considerably in character from the two Atlantic species and from *Sc. japonica*, having more the aspect of a *Johnius*.

The following particulars are noted from a Canton specimen presented to the British Museum by John Reeves, Esq.:—Outer teeth of the upper jaw widely set, short, subulate, acute; a canine tooth a little stouter than the others on each side of the symphysis; and a villiform band within. On the lower jaw, the subulate teeth are a little taller and slightly curved, with numerous small ones amongst them, but no distinct interior villiform bands. The maxillary is strengthened anteriorly by a smooth rib which projects at the tip. Four pores at the end of the lower jaw; and five teeth pointing upwards on the upper limb of the preoperculum. Two thin, flat, triangular, acute and flexible tips to the operculum, with a cartilaginous prolongation of the suboperculum extending much beyond them. Anal spine having about one-third of the length of the soft rays. Scales soft and nacre, the curve of the lateral line terminating at the tip of the pectoral, but less boldly arched than in the figure. Pectorals, under-parts of the body, sides of the head, and ventral spine saffron-yellow, the anal showing a reddish-orange hue. The fish attains a considerable size.

Hab. Sea of China. Canton.

OTOLITHUS AUREUS, Richardson. *Icon. Reeves*, 234; *Hardw. Acanth.* 129. Chinese name, *Kin lœn hwo*, "Gold scale hwo" (Birch); *Kinn lin han*, "Golden-scaled han" (Reeves). *Rad. D.* 10|1|25; *A.* 2|9; *P.* 17; *V.* 1|5.

John Reeves, Esq. presented two Canton specimens of this fish to the British Museum. They have five pores at the tip of the lower jaw; a row of subulate teeth on the upper jaw, a card-like or villiform band within, and a canine tooth near the symphysis. On the lower jaw there are no villiform bands within the subulate teeth, but two or three rows of minute ones exterior to them. Maxillary striated, truncated. Preorbital and snout scaly. Preoperculum streaked on its border and slightly crenato-dentate. Bony operculum ending in two narrow, acute, triangular flat points, separated from each other by a deep oblique fissure. First anal spine almost concealed; second slender, half the length of the soft rays. Colour generally dark with much brown, unspotted on body. Two rows of spots between the rays on second dorsal; pectorals and lower fins orange.

Hab. Canton.

OTOLITHUS REEVESII, Richardson. *Rad. D.* 10|1|31; *A.* 2|7; *C.* 17; *P.* 19; *V.* 1|5.

This species has the general form of the preceding, but differs from it in having a more blunt, rounded, and prominent snout, a shorter rounded caudal, approaching less to a rhomb, and the preoperculum spinously toothed on the upper limb and rounded corner, where the teeth are large. On its under limb the teeth have the usual crenato-dentate character observed in this genus. The dorsal is more deeply divided than in *aureus*, and the two equal tips of the bony operculum are shorter and stronger. The second anal spine, though shorter than the soft rays, is stout and finely striated; dentition and pores on chin as in *aureus*. On the upper half of the body there are oblique lines which pass some way below the lateral line. The number of anal rays forbid us to refer this fish to the *bispinosus* of the 'Histoire des Poissons,' and it does not agree with the others described in that work. The British Museum possesses a Chinese specimen obtained from Mr. Reeves, but he does not appear to have had a drawing made of it.

Hab. Canton.

OTOLITHUS ARGENTEUS, Kuhl et Van Hasselt, apud C. et V. v. p. 62?
Icon. Reeves, 200; Hardw. Acanth. 133. *Rad.* D. 10|1|28; A. 2|7;
 P. 17; V. 1|5. (Chin. Spec. Cam. Ph. Inst.).

In the absence of specimens or figures of the Batavian *O. argenteus*, the Chinese fish can be referred to the same species only with doubt. An example of the Chinese fish was presented to the Cambridge Philosophical Institution by the Rev. George Vachell.

An outer row of short, equal subulate teeth, moderately widely set, arm both jaws, and within the upper ones there is a narrow microscopical villiform band, but none such are perceptible on the lower jaw. A long, curved, and not stout canine stands on each side of the symphysis of each jaw, the upper ones being widely apart, so as to receive the inferior pair between them. The lower jaw is slightly longer than the snout. Curve of the lateral line completed opposite to the anus and middle of the second dorsal. The bony operculum is traversed by two fine ribs whose ends project slightly, the notch between them being inconspicuous. The second anal spine is slender, weak, and only half the length of the soft rays; the first one is a mere point. Length of specimen, 6.55 inches; length of head, 1.55 inch; length from snout to anus, 3.55 inches; from snout to caudal, 5.50 inches; height of body, 1.25 inch.

Hab. Canton. Straits of Malacca? (Major Farquhar). Javan sea? (K. et V. H.)

OTOLITHUS TRIDENTIFER, Richardson. *Icon.* Reeves, β . 54; Hardw. Acanth. 132. Chinese name, *San ya* (Birch); *San nga* (Reeves), "Three-teeth;" *Sám ngá* (Bridgem. Chrest. 142). *Rad.* D. 10|1|27; A. 2|6; P. 15; V. 1|5. (Spec. Br. Mus.)

Two strong curved canines above and one below near the symphysis, with an equal row of lateral subulate teeth on both jaws, more closely set in the lower one. By aid of a lens, a narrow band of villiform teeth can be detected within the others above; and beneath there are a few intermixed with the principal ones. Some striæ are visible on the end of the maxillary; and there are depressions on the lower jaw, but no pores could be detected. The preoperculum is armed feebly by small acute teeth, and the bony operculum shows two narrow points separated from each other by a fissure. The fish is pale and silvery, with a light bluish gray tint along the back. The lower half of the caudal, front of the anal, ventrals, and the pectorals are gall-stone yellow. The rest of the fins are pale and spotless, the upper half of the caudal alone being deeper and approaching to blackish-gray.

Hab. China seas. Canton.

CORVINA GRYPOTA, Richardson. *Icon.* Reeves, β . 12; Hardw. Acanth. Chinese name, *Hwo tow* (Reeves, Birch); *Wák tau* (Bridgem. Chrest. 127). *Rad.* D. 10|1|29; A. 2|7 vel 8; C. 18 $\frac{7}{8}$; P. 18; V. 1|5. (Spec. Hasl. Mus.)

Most of the collections of Chinese fish that we have examined contain examples of a *Corvina*, which with the general aspect of *C. coitor* of Buchanan Hamilton (pl. 27. f. 24), has a straighter profile and a shorter and blunter snout that curves downwards from the nostrils, much like that of *Umbrina vulgaris*; it seems to be allied to *Sciæna lucida*. Upper jaw armed by a concave densely villiform plate of teeth with a stronger subulate outer row, brownish at the tips, which are even; on the lower jaw the villiform plate is boldly convex. Minute pores exist on the snout, and there are five large pores at the end of the lower jaw. The scaly preorbital receives beneath its edge, the entire maxillary and all the intermaxillary except the dental margin. A deep recess exists on the outside of the maxillary pedicles, and a little triangular point of the preorbital lip hangs over it. The limbs of the lower jaw are scaly, and thin bony ridges of the suborbital chain cross the scaly cheek. The preoperculum is bounded towards the cheek by a smooth bony edge; its posterior edge is free and is widely set with slender subulate teeth, the most distinct ones being the tips of ribs which cross the disc of the bone. Interoperculum entire, mostly concealed beneath the preoperculum; suboperculum also entire, rather narrow. Two low even diverging ribs cross the operculum and end in points which are scarcely pungent, and the edge of bone between them is nearly even. Lateral line formed by a series of simple tubes, boldly arched anteriorly, and becoming straight in the tail by a gradual sweep ending opposite the beginning of the anal. Scales tender, nacre, and very deciduous. Second anal spine not strong, a little shorter than the soft rays. Caudal subrhomboidal. Ventrals with a short filamentous tip. Colour mostly silvery, with some yellow tints on fore part of anal, ventrals, and pectorals. Length about 7 inches.

Hab. Canton.

CORVINA SINA, C. et V. v. p. 122; Temm. et Schl. F. J. p. 58. pl. 24. f. 2; *Icon.* Reeves, 94; Hardw. Acanth. 130. Chinese name, *Hwang Hwá*, 1845.

“Yellow Pichere”? (Reeves); *Hwang hwö* “Yellow hwö fish” (Birch); *Wong wák* (Bridgem. Chrest. 99).

The figure of the *hwang-hwa* is the nearest in Mr. Reeves's portfolio to the plate of the ‘Fauna Japonica’ quoted above, but it does not agree exactly with it, the profile of the forehead differing a little, and the anal spine being rather stronger. We have seen no specimen that could be referred to this species.

Hab. Japan, China, and the Indian ocean.

CORVINA CATALEA, C. et V. v. p. 128. *Lutjan diacanthæ*, Lacépède, iv. pp. 195 et 244. *Katchelee*, Russell, 116; *Icon.* Reeves, 207; Hardw. Acanth. 128. Chinese name, *Man yu* (Reeves); *Man ü* (Bridgem. Chrest. 174). *Rad.* D. 10|–1|21; A. 2|7; P. 19 vel 20; V. 1|5. (Chin. Spec. Brit. Mus.)

A Chinese specimen of this fish, $9\frac{1}{2}$ inches long, has been deposited in the British Museum by John Reeves, Esq. The spots are as in Russell's plate, with a few more of them descending below the lateral line, but there are also two rows of spots on the first dorsal, which are only obscurely indicated in Mr. Reeves's figure.

Hab. Indian ocean. China sea. Canton.

CORVINA NALLA-KATCHELEE, Russell, 115; *Icon.* Reeves, 225; Hardw. Acanth. 134. Chinese name, *Ma-man* (Birch); *Ma pin* (Reeves). *Rad.* D. 10|–28; A. 2|7; P. 16; V. 1|5. (Chin. Spec. Brit. Mus.)

The British Museum possesses a mounted specimen of this fish and one in spirits, both brought from Canton by Mr. Reeves. Russell says that the Coromandel fishermen take this to be the male of *C. catalea*. The differences in the numbers of the rays of the fins seem to render it expedient to keep them distinct; the snout of this is more obtuse; like the preceding, it has five pores on the lower jaw; the second anal spine is only half the length of the soft rays.

Hab. Indian and China seas. Canton.

CORVINA? ALBIFLORA, Richardson. *Icon.* Reeves, β . 48; Hardw. Acanth. Chinese name, *Pih hwa* (Birch); *Pih fa* (Reeves), “White flower;” *Pák sfá* (Bridgem. Chrest. 129).

This is apparently a *Corvina* with stronger teeth than the other species in Mr. Reeves's portfolio, but we have seen no specimen that can be referred to it, nor can we identify it with any one described in the ‘Histoire des Poissons’ by the short accounts of the species therein mentioned. The base of the second dorsal is marked by a row of black dots, one on each ray. The general colour is silvery with pale bluish-gray on the discs of the scales, the gray tint deepening along the dorsal line. Pectorals, fronts of the ventrals and anal and lobes of the caudal, more or less deeply tinged with orange or yellow. First dorsal darker than the other fins, but there are no spots except the row on the base of the second dorsal.

Hab. Canton.

UMBRINA RUSSELLII, C. et V. v. p. 178; *Qualar-katchelee*, Russell, 118; *Icon.* Reeves, β . 37; Hardw. Acanth. Chinese name, *Säng seu hwa* (Birch); “Live pencil-beard” (Reeves); *Shang ssú wák* (Bridgem. Chrest. 175). *Rad.* D. 11|27; A. 2|7; C. $15\frac{6}{8}$; V. 1|5. (Spec. Camb. Ph. Inst.)

The Cambridge Philosophical Institution is indebted to the Rev. George Vachell for a Canton specimen of this fish. It has a mesial barbel on the chin, with a deep pore on each side of it, and fifty scales on the lateral line. The whole fish is brightly nacy with a pale reddish-brown tint along the dorsal line; pale yellow second dorsal, pectorals, and ventrals; and front of anal yellow or orange.

Hab. Indian and China seas. Canton.

Fam. HÆMULONIDÆ.

DIAGRAMMA CINCTUM, Temm. et Schl. F. J. p. 61. pl. 26. f. 1; *Icon.* Reeves, 82; Hardw. Acanth. Chinese name, *Hwa juen shin*, “Flowery soft lips” (Birch); *Fa juen shen* (Reeves); *Fá un shan* (Bridgem. Chrest. 95).

The Chinese collection at Hyde Park and the British Museum contain several specimens of this fish, which we have compared with a specimen of Bürger's from Japan, also belonging to the latter institution. The bands of colour, and indeed the whole form of the fish, are singu-

larly like those of *Diacope sebae* (Russell, 99; C. et V. ii. p. 411), but there are no spots on the latter. The markings still more closely resemble those of *Hapalogenys maculatus* (Reeves, a. 49). Mr. Reeves's drawing represents both the Chinese and Japanese specimens more faithfully than the figure published in the 'Fauna Japonica,' but the profile of neither is quite steep enough.

Hab. Coasts of China and Japan.

DIAGRAMMA GATERINA, Forskal (*Sciæna*), C. et V. v. p. 301. pl. 125. *Holocentre gaterin*, Lacép. iv. p. 347; Rüppell, Atl. 32. f. 1; *Icon.* Reeves, a. 50; Hardw. Acanth. 50. Chinese name, *Hung teen tseu* (Birch); *Hung teen tso* (Reeves), "Red-spotted tso fish." *Rad.* D. 14|15; A. 3|7, &c. (Spec. Chin. Collect.)

Notwithstanding the difference in the numbers of the dorsal rays, I have ventured to refer this Chinese fish to the *Sciæna gaterina* of Forskal. Rüppell's figure differs from the one in the 'Histoire des Poissons' considerably in the steepness of the profile. Mr. Reeves's drawing is in this respect most like the latter, but in the form and distribution of its spots it has more resemblance to Rüppell's figure. The Chinese collection at Hyde Park contains a specimen of this fish.

Hab. Red sea and coasts of China.

DIAGRAMMA PICTUM, Thunberg (*Perca*), Nov. Mém. de Stockh. xiii. p. 141. pl. 5; C. et V. v. p. 315; Temm. et Schl. F. J. p. 62; Hardw. Acanth. 138.

A specimen sent to the museum at Haslar from Hong Kong, by Surgeon R. A. Bankier, R.N., differs from the description of the species in the 'Histoire des Poissons,' in its first dorsal being black with a white edge, which is the extension of the mesial frontal band.

Hab. Seas of Japan, China and Malay archipelago, and the Indian ocean.

DIAGRAMMA PÆCILOPTERUM, C. et V. v. p. 314; Seba, iii. pl. 27. f. 17; Temm. et Schl. v. p. 314; *Icon.* Reeves, 190; Hardw. Acanth. 65. *Rad.* D. 10|21; A. 3|6, &c. (Chin. Spec.)

Specimens exist in the Chinese collection at Hyde Park, and we have found dried ones in the Chinese insect-boxes.

Hab. Seas of Japan, China, Malay archipelago, and India.

DIAGRAMMA PUNCTATUM, Ehrenberg, C. et V. v. p. 302; Temm. et Schl. F. J. p. 60; Quoy et Gaim. Voy. de l'Astrol. pl. 12. f. 2; Rüppell, Atl. pl. 32. f. 2; *Icon.* Reeves, 78; Hardw. Acanth. 30. Chinese name, *Yaou we*, "Want tail" (Birch); *Yaou ne* (Reeves); *Yap mî* (Bridgem. Chrest. 214).

The colouring of Mr. Reeves's drawing corresponds closely with the description in the 'Fauna Japonica,' and approaches nearer to the plate in the 'Voyage of the Astrolabe' than to that in Rüppell's 'Atlas.' The Chinese collection at Hyde Park contains a specimen. It has three pairs of pores on the lower jaw.

Hab. Red sea, Malay archipelago, and seas of China and Japan.

PRISTIPOMA KAAKAN, C. et V. v. p. 244; Rüppell, Neue Wirlb. p. 123. pl. 30. f. 1; *Icon.* Reeves, 201; Hardw. Acanth. 52. Chinese name, *Tow loo* (Birch, Reeves); *Tau lò* (Bridgem. Chrest. 134). (Chin. Spec.)

A specimen from China has been deposited in the British Museum by John Reeves, Esq.

Hab. Red sea, Indian ocean, Malay archipelago, and China sea.

PRISTIPOMA NAGEB, Rüppell, Neue Wirlb. p. 124. taf. 30. f. 2; *Icon.* Reeves, 244; Hardw. Acanth. 62. Chinese name, *Sing loo* (Reeves); "Starry loo fish" (Birch). *Rad.* D. 12|12 ad 15; A. 3|7; &c. (Chin. Spec.)

John Reeves, Esq. has deposited a specimen of this fish in the British Museum. The Rev. George Vachell presented another to the Cambridge Philosophical Institution, and there are several in the Chinese collection at Hyde Park.

Hab. Red and China seas.

PRISTIPOMA PIHLOO, Richardson. *Icon.* Reeves, a. 29; Hardw. Acanth.

135. Chinese name, *Pih loo*, "White loo fish" (Reeves, Birch); *Pak lo* (Bridgem. Chrest. 135). *Rad.* D. 11|14; A. 3|8; C. 17 $\frac{4}{4}$; P. 16; V. 1|5.

Mr. Reeves's China specimen is in the British Museum. It greatly resembles *nageb*, but has a more convex profile, and differs in its markings. It has a row of seven roundish dark spots or short transverse bars along the back above the lateral line, in which respect it differs from *P. guoraca*, whose form is not dissimilar. No pores were detected on the lower jaw. The teeth on the jaws are villiform, the dental surface being narrower on the upper jaw, and bounded by an outer row of short subulate teeth. The roof of the mouth is toothless. Space round the nostrils and jaws nacy; all the opercular pieces and the cheek scaly. Disc of preoperculum broad, its outline parabolic and its posterior edge toothed, the teeth being more remote at the corner. The figure, which is otherwise a good representation of the specimen, does not bring the curve of the preoperculum far enough back. A band of small scales crosses the nape from one scapula to the other; the second anal is longer and stronger than the third one. This species is similar in its markings to *Mesoprion johnii*, Bl. 318, but the specimen has no vomerine nor palatine teeth. (C. et V.)

Hab. Canton.

PRISTIPOMA JAPONICUM, C. et V. v. p. 288; Temm. et Schl. F. J. p. 60. pl. 26. f. 2; *Icon.* Reeves, 202; Hardw. Acanth. 71. Chinese name, *Hae tseih* (Birch); *Hae tseik* (Reeves), "Sea-tsaou;" *Hoi tsik* (Bridgem. Chrest. 223). Japanese name, *Jousaki* (Langsdorff). *Rad.* D. 15|16; A. 3|7; P. 17, &c. (Chin. Spec. Brit. Mus.)

The figure in the 'Fauna Japonica' represents a fish with a considerably lower body than the Chinese, which we have referred to that species on account of its agreement in all other respects with the characters of the species. The British Museum received a Chinese specimen from John Reeves, Esq. Second and third anal spines equal and striated. The scales are small.

Hab. Coasts of China and Japan.

PRISTIPOMA? CHLORONOTUM, Richardson. *Icon.* Reeves, 231; Hardw. Acanth. 77. Chinese name, *Tsing pei cha*, "Green-backed tseu fish" (Birch); *Ching keae tso* (Reeves). *Rad.* D. 12|22 vel 23; A. 3|12; &c. (from the drawing.)

Of this fish we have seen no specimen. It has the thickish lips and preoperculum of a *Pristipoma* and the even dorsal of *Pr. japonicum*. The scales are larger than in that species, and the second anal spine is conspicuously longer and stronger than the third one. A greenish-gray tint, approaching where most intense to olive-green, pervades the upper parts of the body and the vertical fins, being deepest on the discs of the scales, which have silvery margins. The sides are paler and are glossed by auricula-purple, and the lips, cheeks, and pectoral and ventral fins are lavender-purple without spots anywhere.

Hab. Seas of China. Canton.

PRISTIPOMA? GALLINACEUM, Richardson. *Icon.* Reeves, β . 22; Hardw. Acanth. 44. Chinese name, *Ke yu*, "Fowl-fish" (Reeves, Birch). *Rad.* D. 14|18; A. 2?|7, &c. (from the figure.)

Of this also I have seen no specimen: judging from the figure, it seems to approach *Pr. japonicum*, but its scales are larger and its dorsal more notched. Its lower fins are orange and its caudal lobes tipped with carmine, the body generally silvery and the fins unspotted. It is possible that this may be the *Hæmulon* mentioned by Dr. Cantor as frequenting the estuary of the *Peiho*. It has carmine blotches on the lips like *Hæmulon*.

Hab. China seas. Canton.

PRISTIPOMA? GRAMMOPECILUM, Richardson. *Icon.* Reeves, α . 9; Hardw. Acanth. 56. Chinese name, *Zuen chin lä*, "Soft-mouthed lä fish" (Birch); *Quen shin la*, "Flexible-finned lap" (Reeves); *Un shan lap* (Bridgem. Chrest. 96). *Rad.* D. 14|20; A. 3|9 vel 10, &c. (from the figure.)

This fish has a different physiognomy from any of the preceding ones, and we cannot assign it to a genus with confidence, from not having seen a specimen. It has the even dorsal of *Pr. japonicum*, but much larger scales, which are silvery. The cheeks and side of the head

are streaked by nine or ten reddish stripes, and the whole back and sides are dotted with red spots about the size of partridge shot. The fins are dark and without spots; the parts about the mouth are carmine, as in *Hæmulon*.

Hab. Canton.

Fam. SERRANIDÆ.

MESOPRION UNIMACULATUS, C. et V. ii. p. 441; Quoy et Gaim. Zool. de Freyc. p. 304. pl. 5. f. 3. *Doondiawah*, Russell, 97; *Icon.* Reeves, a. 25; *Hardw. Acanth.* 21. *Hwang tsaou*, "Yellow tsaou fish." Chinese name, *Hwang tso*, "Yellow tso" (Reeves); *Wang tso* (Bridgem. Chrest. 133). *Rad.* D. 10|13 vel 14, A. 3|7, &c. (China spec. Brit. Mus.)

The specimen collected at Canton by John Reeves, Esq. is deposited in the British Museum. *Hab.* Indian ocean, Malay archipelago, and China seas.

MESOPRION HOTEEN, Richardson. *Icon.* Reeves, a. 28; *Hardw. Acanth.* 66. *Ho teen*. Chinese name, *Ho teen yo*, "Burn-spotted" (Reeves); *Fo tim tso* (Bridgem. Chrest. 220). *Rad.* D. 10|13; A. 3|8, &c. (Spec. Brit. Mus.)

Several examples of a Chinese fish strongly resembling the preceding exist in the Chinese collection at Hyde Park and in the British Museum, but differing from it in having a preopercular notch and subopercular knob, both slighter than is usual in *Diacope*. Neither the specimens nor drawing agree sufficiently with Russell's figure 110 (*Mesoprion quinquelineatus*, C. et V.), nor 98 (*Diacope notata*, C. et V.), nor with Bloch's *M. johnei* (318), to be referred to either of them.

The canine teeth in the upper jaw are acute and well-apart. In the lower jaw there is a short one in the middle of the limb on each side. The vomerine and palatine teeth are covered by the horizontal velum. The preorbital and lower jaw are studded with minute pores. A small pit exists on the chin. The scales of the cheek form an oval oblique band extending from the temples to near the corner of the mouth, bounded above by smooth integument, which spreads over the preorbital and below by the disc of the preoperculum. Preoperculum having a broad disc coarsely toothed at the corner, some of the inferior teeth pointing forward; under limb serrated; operculum with two obtuse lobes. The darker discs of the scales form rows of faint spots. Second and third anal spines about equal in length, the second one a little the stoutest, and neither of them equal to the soft rays in length.

Hab. China seas. Canton.

MESOPRION ANNULARIS, C. et V. ii. p. 484. et iii. p. 497. *Diacope annularis*, Rüppell, Atl. p. 74. taf. 24. f. 2; Quoy et Gaim. Astrol. pl. 5. f. 4. *Rad.* D. 11|14; A. 3|8; C. 16 $\frac{+}{+}$; P. 15; V. 1|5. (Spec. Camb. Ph. Inst.)

The Rev. George Vachell presented a Canton specimen to the Cambridge Philosophical Institution.

Hab. Indian ocean. Javan and China seas.

DIACOPE CALVETII, Quoy et Gaim. Voy. de l'Uranie, pl. 57. f. 1; C. et V. ii. p. 429; Temm. et Schl. F. J. p. 14.

Hab. Japan. Timor.

DIACOPE SPARUS, Temm. et Schl. F. J. p. 14.

Hab. Japan.

DIACOPE BORENSIS, C. et V. ii. p. 436. *Diacope tiea*, Lesson, Voy. de Duperrey, p. 231. pl. 23; *Icon.* Reeves, 196; *Hardw. Acanth.* 68. Chinese name, *Heung yu*, "Cock," or "Male fish (Birch);" *Hung u* (Bridgem. Chrest. 167). *Rad.* D. 11|14; A. 3|9, &c. (Reev. spec. Brit. Mus.)

Hab. Polynesia. China sea. Canton (Reeves). Society isles (Lesson).

DIACOPE OCTOLINEATA, C. et V. ii. p. 118; Temm. et Schl. F. J. p. 12. pl. 6. f. 2. *Holocentrus quinquelinearis*, Bl. 239. *H. bengalensis*, Bl. 246. f. 2. *Perca vittata*, Solander, *Icon.* Parkins. Bibl. Banks. *Perca polyzonias*, Forst. Animal. cura Lichtenst. p. 225; *Icon.* Georg. Forster,

Biblioth. Banks; *Icon. Reeves*, 93; *Hardw. Acanth.* 29 & 33. Chinese name, *Hwa mei tsaou* (Birch); *Hwa mei tso*, "Painted eye-brow" (Reeves); *Wamii tso* (Bridgem. *Chrest.* 68).

A common Chinese fish, and in all the collections. Most of the Chinese specimens have the fifth line below the pectoral, which is often wanting in examples from other quarters; and one specimen in the Chinese collection at Hyde Park has the lateral black mark so frequent in the *Diacopes*.

Hab. Red sea, Mauritius, Polynesia, Australia, Malay archipelago, Chinese and Japanese seas.

PLECTROPOMA LEOPARDUS, Lacépède (*Holocentrus*), iv. p. 332 et 337. *Plectropoma leopardinum*, C. et V. ii. p. 392. t. 36; Temm. et Schl. *Faun. Japon.* Sieb. p. 12.

Hab. Seas of Japan and Australia.

PLECTROPOMA SUSUKI, C. et V. ii. p. 404; Temm. et Schl. *F. J.* p. 11. pl. 4. f. 1 (upper figure); *Icon. Reeves*, a. 34; *Hardw. Acanth.* 25. Chinese name, *Tsing shih pan* (Birch); *Ching sheh pan*, "Blue garoupa" (Reeves); *Shih pan u* (Bridgem. *Chrest.* 59).

Mr. Reeves states this to be the commonest of the *Serrani* or Garoupas on the Chinese coast.

Hab. Coasts of China and Japan.

(*Merous.*)

SERRANUS ALTIVELIS, C. et V. ii. p. 324. t. 25; *Icon. Reeves*, 267; *Hardw. Acanth.* 67. Chinese name, *To yu*, "Carrier fish" (Birch); *Ming yu* (Reeves). *Rad. D.* 10|18 vel 19; A. 3|9 vel 10; P. 15. (Spec. Brit. Mus.)

The British Museum possesses a specimen obtained in one of Cook's voyages, and one brought from China by John Reeves, Esq. Sir Edward Belcher also obtained one in his voyage in the Sulphur.

Hab. Javan and Chinese seas.

SERRANUS GILBERTI, Richardson, *Ann. Nat. Hist.* March 1842. vol. ix. p. 19; *Icon. Reeves*, 257; *Hardw. Acanth.* 26. Chinese name, *Hwä paou yu*, "Spotted leopard fish;" *Fa kou yu*, "Spotted garoupa" (Reeves). *Rad. D.* 11|17; A. 3|9; C. 15 $\frac{2}{3}$; P. 17; V. 1|5. (Spec. Brit. Mus.)

This is one of the *Serrani* which bear a close resemblance to *merra*, and are perhaps merely varieties of that species. It is a common fish in the southern seas, yet I have not been able to identify it with any of the numerous species or varieties described in the 'Histoire des Poissons.' In the British Museum there are examples from China and North Australia which do not differ from each other.

Hab. Torres straits. China seas.

SERRANUS MEGACHIR, Richardson. *Icon. Reeves*, 113; *Hardw. Acanth.* 28. Chinese name, *Tae mei pan*, "Tortoise-shell garoupa" (Reeves). *Rad. D.* 11|15; A. 3|8; C. 12 $\frac{2}{3}$; P. 15; V. 1|5. (Spec. Brit. Mus.)

This is another *merou*, almost identical in the markings of its body and fins with *gilberti*, but distinguished from it and from *merra* by the greater size of its pectoral fin, which is edged with black and reaches beyond the anus. The only species described in the 'Fauna Japonica' which resembles this, is the *S. epistictus*, and that has the spots on the fore part of the body ranged in three rows, which coalesce into one row posteriorly. The "tortoise-shell merou" grows to the length of a foot. There are examples of it in the Chinese collection at Hyde Park and in the British Museum, the latter presented by Mr. Reeves.

Hab. Coasts of China.

SERRANUS EPISTICTUS, Temm. et Schl. *F. J.* Sieb. p. 8.

None of Mr. Reeves's drawings correspond with the description of this species, nor have we seen any Chinese specimens of it.

Hab. Japanese sea.

SERRANUS AKA-ARA, Temm. et Schl. F. J. p. 9. pl. 3. f. 1.

Rad. D. 11|15; A. 3|8. (Bürger's Spec. Brit. Mus.)

D. 11|16; A. 3|8; C. 17; P. 15; V. 1|5. (F. Jap.)

The British Museum possesses one of Bürger's specimens of this fish, which was labelled *kazzo ara*.

Hab. Sea of Japan.

SERRANUS SHIH PAN*, *Icon.* Reeves, 71; *Hardw. Acanth.* 39. Chinese name, *Shih pan* (Reeves); *Shik pan u* (Bridgem. Chrest. 59). *Rad.* D. 11|16; A. 3|8; C. 17 $\frac{4}{5}$; P. 16 vel 17; V. 1|5. (Spec. Brit. Mus.)

I have been strongly inclined to consider this fish as identical with the preceding one, but nothing is said in the 'Fauna Japonica' of the dark bars which cross the body, and which are very evident both in the dried specimens and in those preserved in spirits. The species appears to be common in the China seas and to attain the size of 16 or 18 inches. We have seen examples of it in the Chinese collection at Hyde Park, the British Museum, and the Cambridge Philosophical Institution.

Teeth rather small, each intermaxillary armed by a curved canine. In the lower jaw the canines are longer, and the outer row is composed of subulate teeth set widely. The chevron of the vomer is acute and small, and the dental bands of the palate bones are narrow and feebly toothed. The limbs of the preoperculum meet at rather less than a right angle, the upper one slightly convex and acutely toothed, the lower one almost straight, with microscopical crenatures. In some specimens, the coarse teeth at the angle of the bone are divided by a notch into two groups, in others there are two strong divergent teeth at the angle; the bone is densely scaly up to the teeth. In Mr. Reeves's figure the preoperculum is shown of too parabolic a form. The operculum ends in three acute teeth, the middle one being the largest; the tip of the gill-cover is slender and acute; small scales cover the lower jaw, and the scales on the body are strongly ciliated; the lateral line is conspicuous and formed of a series of tubes, one on each scale inclined upwards, and the fins are scaly to near their tips. Five or six dark bars cross the sides, two of them running up on the spinous dorsal, and two on the soft fin, which is also traversed in the middle by a cross-bar. The bars are irregular in form, and the caudal fin is crossed by two or three less distinct ones. The body and head are marked by round red spots, much as *aka-ara* is represented to be in the 'Fauna Japonica,' and there are some larger faint red marks on the spinous dorsal. The anal and pectoral are both crossed by dusky bars or clouds, and the ventrals are edged with the same. All the under-parts of the head and body are aurora-red. The Chinese name has been attached to this species as a provisional designation until the suspicion above-mentioned of its identity with the *aka-ara* be proved or disproved.

Hab. China seas. Canton (Reeves, Vachell, &c.).

SERRANUS VARIEGATUS, *Icon.* Reeves, 87; *Hardw. Acanth.* 22. Chinese name, *Ta shih pan*, "Variegated garoupa" (Reeves). *Rad.* D. 11|10; 2|7, &c. (Reeves's drawing.)

Were it not for the small number of rays in the soft dorsal indicated in the figure here quoted, I should have no hesitation in saying that it is the representation merely of a young individual of the *shih pan*. The cross bands, however, are fewer, broader and fainter. The buff-coloured ground tint and the deep orange-red spots are the same in both. In the *variegatus* these spots form two rows on both the spinous and soft parts of the dorsal, and also on the upper half of the tail; and there are two black spots with pale borders on the latter fin. All the vertical fins are obscurely clouded or banded, and the pectorals are buff-coloured with orange borders and black bases. We have seen no specimen that corresponds to this figure, which measures 5 $\frac{1}{2}$ inches.

Hab. China seas. Canton.

SERRANUS AWO-ARA, Temm. et Schl. F. J. Sieb. p. 9. pl. 3. f. 2. *Rad.* D. 11|16; A. 3|8. (Spec. of Bürger's, Brit. Mus.)

One of Bürger's specimens, now in the British Museum, has been carefully compared with Mr. Reeves's drawings, and not identified with any of them. The yellow borders of the fins distinguish this fish when recent.

Hab. Sea of Japan.

SERRANUS URA, C. et V. ii. p. 332. *S. ara*, Temm. et Schl. F. J. Sieb. p. 9.

Having seen neither specimens nor figures of this fish, we are unable to say, from the short

* The words *shih pan* means "stone-coloured stripe."

descriptions of it in the works we have quoted, what are the characters that distinguish it from the other Chinese species.

Hab. Sea of Japan.

SERRANUS AREOLATUS, Forskal (*Perca*), C. et V. ii. p. 350. *Perca taurina*, Geoff. Saint-Hilaire, Egypt, pl. 20. f. 1; Is. Geoff. p. 201. *Serranus areolatus japonicus*, Temm. et Schl. F. J. Sieb. p. 8.

The Japanese fish is stated to differ from the species in the Red sea only in having the pectorals of a uniformly yellow hue and the caudal slightly rounded. We have seen no specimen of it.

Hab. Red sea. Sea of Japan.

SERRANUS REEVESII, Richardson. *Icon. Reeves*, 211; *Hardw. Acanth.* 32. Chinese name, *Fa pan*, "Variegated garoupa" (Reeves); *Fa pan u* (Bridgem. *Chrest.* 62). *Rad.* D. 11|14; A. 3|8, &c. (*ex figurá.*)

The spots of this figure are singularly like those of *S. hexagonatus* (Forster, C. et V. ii. p. 330), but the angles of the meshes want the bright white spots; there is a more decided notch in the preoperculum, and the third anal spine is longer than the second. The ground colour is pale aurora-red, the spots orange-brown, and the head and body are clouded by about twelve large brown patches on each side. The spots are equally crowded on all the fins, but are rather rounder than on the body. They are slightly deeper than the ground tint on the pectorals, which is like that of the body, but clearer. The other fins have a brownish hue, and the spots on the dorsal and ventrals are umber-brown, and on the caudal and anal auricula-purple; the ground tint of the latter fins being also dark. The upper tip of the caudal is lighter: that fin is truncated or slightly rounded. The lower jaw projects considerably beyond the upper one. Length of the figure 10 inches.

Hab. Sea of China. Canton.

SERRANUS STIGMAPOMUS, Richardson. *Icon. Reeves*, 72; *Hardw. Acanth.* 24. Chinese name, *Hih shih pan*, "Black garoupa" (Reeves); *Hak shik pau* (Bridgem. *Chrest.* 59). *Rad.* B. 7; D. 9|17; A. 3|8; C. 19, &c.

The individual from which Mr. Reeves's drawing was made was presented by that gentleman to the British Museum. It agrees singularly well with the description of *Serranus kawamebari* in the 'Fauna Japonica,' in all that relates to colours and markings; but that species differs in the number of rays, and is said to belong to the true *Serrani* with naked jaws, while this is a *Merou*.

The teeth are small and fine, but with a canine on each side of the symphysis of the upper jaw. No scales on the upper jaw or maxillary, but the snout is scaly even before the nostrils, and scales exist on the preorbital and suborbitals, and cover the preoperculum to its extreme edge. The lower jaw is furnished with small, deeply imbedded scales. Preoperculum curved in the arc of a circle, and minutely toothed in a pectinated manner on its upper limb, a little coarser at the angle. Gill-cover very obtuse, or cut nearly vertically with a slightly projecting tip opposite the central spine, which is thin and flat. Lateral line considerably arched. Fins rounded and covered with small scales. The anal has three stout spines, shorter than the soft rays.

The colour is pale chestnut, with eight well-defined and regular, darker vertical bands, which encroach a little on the dorsal. The head and fins are mostly of the colour of the bands; the tips of the dorsal and edges of the pectoral and anal dark. The soft dorsal has a pale edge, and the upper edge of the caudal is pale, the under one dark. A round black spot occupies the membrane filling the sinus between the two upper opercular spines.

Hab. China seas. Canton (Reeves). North-west coast of Australia? (Lieut. Emery.)

SERRANUS NEBULOSUS, C. et V. ii. p. 313. *Rad.* D. 11|16; A. 3|7 vel 8 (second spine longest). (*Spec. Brit. Mus.*)

There are two specimens of this fish in the British Museum, which were brought from Canton by John Reeves, Esq., and one whose origin is unknown.

Hab. China seas.

SERRANUS TRIMACULATUS, C. et V. ii. p. 331; Temm. et Schl. F. J. Sieb. p. 8. *Epinephelus japonicus*, Krusenst. *Voy.* pl. 64. f. 2. *Rad.* D. 11|17; A. 3|7; C. 15½; P. 17; V. 1|5. (Several spec.)

In the 'Histoire des Poissons' the numbers of the rays being quoted from Krusenstern's figure are erroneous. There seems however to be some variation in their number. In one of

Bürger's Japanese specimens in the British Museum we reckoned D. 11|15, the last divided so deeply that it might be taken for two, and A. 3|8. In the 'Fauna Japonica' the numbers are stated to be D. 11|16; A. 3|8, &c., and we have given above the numbers we found in Chinese specimens brought from Canton by John Reeves, Esq. and the Rev. George Vachell.

Hab. Seas of China and Japan. Canton.

SERRANUS PÆCILINOTUS, Temm. et Schl. F. J. Sieb. p. 6.

Hab. Japanese seas.

SERRANUS OCTOCINCTUS, Temm. et Schl. F. J. Sieb. p. 7.

Hab. Japanese seas.

SERRANUS LATIFASCIATUS, Temm. et Schl. F. J. Sieb. p. 7.

Hab. Japanese seas.

SERRANUS MYRIASTER, C. et V. ii. p. 365; Rüppell, Atl. pl. 27. f. 1. *Mérou mille étoiles*, Quoy et Gaim. Voy. de l'Astrol. pl. 3. f. 1; Voy. de la Coquille, pl. 37. *Rad.* D. 9|16; A. 3|8; C. 15 $\frac{2}{3}$; P. 17; V. 1|5. (Chin. Spec.)

A specimen of this fish was brought from the Chinese seas by Sir Edward Belcher, which is much better represented by Rüppell's figure than by those given in the other works we have quoted. The figure in the 'Voy. of the Coquille' wants the blue edging of the fins, and has more resemblance even in the colouring to the *Serranus rogae* of Rüppell than to *myriaster*. We have seen examples from Australia which differ in no respect from the Chinese ones.

Hab. Sandwich islands. Polynesia. New Guinea. Australia. China and the Red sea.

SERRANUS CYANOPODUS, *Icon.* Reeves, 249; *Hardw. Acanth.* 69. Chinese name, *Tsing te* (Birch); *Ching te*, "Blue foot" (Reeves). *Rad.* D. 11|20; A. 3|7, &c. (*ex figurá.*)

This drawing has a general resemblance to *S. myriaster*, but with a more arched nape, a higher spinous dorsal, a projecting point at the corner of the preoperculum, much smaller and differently disposed dots. The general colour is flax-flower-blue, deepening to indigo on the back, and having purplish tints on the face and breast. The spots are small, bluish-black, and extend to all the fins, except the pectoral and anal. They become gradually less on the lower parts of the sides and disappear on the breast and belly. The pectorals are yellowish-gray, with blue bases; but the rest of the fins are blue like the body, the extremity of the caudal being also tinged with blue and the anal with purple. The fins do not show the marginal streak so evident in *myriaster*. The caudal is truncated.

Hab. China seas. Canton.

SERRANUS FORMOSUS, Shaw (*Sciæna*), *Zool. Misc.* pl. 1007; C. et V. ii. p. 311. *Rahtee bontoo*, Russell, pl. 129; *Icon.* Reeves, a. 46; *Hardw. Acanth.* 31. Chinese name, *Hih kwei tsze*, "Black-spirit thorn" (Birch); *Hih kwei tze*, "Black spirit" (Reeves). *Rad.* D. 9|17; A. 3|8, &c.

Minute scales cover the entire surface of the maxillary, except the folds of the lips; and the fins are densely scaly. The general tint of the body, dorsal and base of the anal is reddish-orange, the gill-cover being tinged with siskin-green. The body is traversed by numerous china-blue lines, which are oblique on the back, but horizontal on the sides. They run out upon the dorsal and anal, changing to sap-green. Six of the blue lines cross the face, radiating from round the orbit, and there are some blue spots before the eye and on the lips. The rays of the ventrals are partly blue, partly green; the outer half of the anal is green, and it has a border of blue and black. The pectorals and anal are dark prussian-blue, their rays being paler. Russell's plate omits the lines on the spinous dorsal, gives a wrong direction to those on the anal, and represents all the lines as too broad. Mr. Reeves's drawing is an excellent representation of a specimen in the Chinese collection at Hyde Park.

Hab. Indian ocean. Sea of China. Canton.

SERRANUS MARGINALIS, Bloch, 328 (*Epinephelus*); C. et V. ii. p. 301. *Holocentre rosmare*, Lacép. iv. pl. 7. f. 2. *S. tsirimenara*, Temm. et Schl. F. J. p. 8; *Icon.* Reeves, 246; *Hardw. Acanth.* 27. *Rad.* D. 11|15 vel 16; A. 3|8, &c. (Spec. Brit. Mus.)

The *tsirimenara* of the 'Fauna Japonica' is distinguished by the authors from *marginalis*

by its possessing a row of five or six irregular, whitish and indistinct spots on the flanks. Mr. Reeves's figure shows vertical bands in pairs, faint, and merely a little paler than the rest of the red colour, but no spots. There are Chinese specimens in spirits in the British Museum and Chinese collection at Hyde Park, which offer no tangible difference when compared with a dried specimen of Bürger's, also in the British Museum. Neither could we detect any discrepancy betwixt the Chinese specimens and one obtained at Copang, in the island of Timor, by Mr. Gilbert.

Judging solely from the description of *S. oceanicus* in the 'Histoire des Poissons,' in the absence of authentic specimens or good figures, it appears to be the same with *marginalis*; but the *Perca fasciata* of Forskal, referred by Cuvier to *oceanicus*, is probably a different species. Its dorsal and anal fins are edged with yellow, and it is evidently the same with the *Perca rubescens* of Solander, of which a drawing by Parkinson (No. 61) exists in the Banksian Library.

Hab. Javan, Chinese and Japanese seas.

We have seen no specimen corresponding with Mr. Reeves's drawing 255 (Hardw. Acanth. 23), which looks like a less carefully executed representation of a young *S. marginalis*. Its anal spines are however proportionally larger, and its cheek and gill-cover are glossed with green. The Chinese name is *Hing pau yu*, "Red garoupa."

SERRANUS MOARA, Temm. et Schl. F. J. Sieb. p. 10. f. 2. *lower figure* (which is erroneously numbered).

Hab. Sea of Japan.

SERRANUS DERMOPTERUS, Temm. et Schl. F. J. Sieb. p. 10.

Hab. Sea of Japan.

(*Serrans propres.—Perches de mer.*)

SERRANUS VITTA, Quoy. et Gaim. Voy. de Freyc. pl. 58. f. 3; C. et V. ii. p. 239; Temm. et Schl. F. J. Sieb. (*Diacope*), p. 13. pl. 6. f. 1; *Icon. Reeves*, β. 27; Hardw. Acanth. 51. Chinese name, *Ho tsaou* (Birch); *Ho tso*, "Fire tso" (Reeves); *Fo tso* (Bridgem. Chrest. 132).

Two young individuals of this species, which Surgeon Bankier has sent from Hong Kong, have the lateral stripe darker than in older individuals, and a black mark swelling round that part of it which is under the middle of the soft dorsal, as in some *Diacopes* and *Mesoprions*. There is scarcely any notch in the preoperculum either in the young or old, and the subopercular knob is very indistinct. The dental plate of the vomer is rhomboidal, and the habit of the fish is not that of *Serranus*, neither is it more like *Diacope*.

Hab. North coast of Australia. New Guinea. Javan, Chinese and Japanese seas. Hong Kong (Surgeon R. A. Bankier).

SERRANUS KAWAMEBARI, Temm. et Schl. F. J. Sieb. p. 5. "*Rad. D. 12|12; A. 2|10,*" &c. (*Fauna Jap.*)

This is compared with *hepatus* in the 'Fauna Japonica,' and is described as possessing a round black spot between the two upper opercular spines.

The British Museum possesses a Canton specimen presented to it by Mr. Reeves, which we are inclined to consider as the *kawamebari*, though it wants the black opercular spot. It has the scaleless jaws and narrow, naked preopercular disc of the true *Serrani*. The upper limb of the preoperculum is nearly vertical, slightly arched, finely toothed, with four or five stronger divergent teeth at the squarish angle, and a horizontal toothless under limb. Lateral line slightly arched. Fins delicate, rounded. Ground colour pale brown, marbled with irregular darker confluent spots. The sides are traversed by six bars inclining forwards as they descend, and rendered paler by the absence of the spots which fill the interspaces. On the head the same colours, but the pale bands are longitudinal. Three dark lines cross the cheek obliquely from the eye to the angle of the gill-cover. The dorsal is obscurely clouded with a dark point behind the tip of each spine: the soft dorsal and anal are darkish, the pectoral nearly colourless. Length of specimen 6 inches.

Hab. Seas of Japan and China. Canton (Reeves).

(*Les Barbiers.*)

SERRANUS OCLATUS, C. et V. ii. p. 266. pl. 32; Temm. et Schl. F. J. Sieb. p. 5.

Hab. Japanese and Caribbean seas.

CAPRODON, Temm. et Schl. F. J. Sieb. p. 64. pl. 30.

This fish is placed with doubt as to its true position among the *Sciænidæ* by the authors of the 'Fauna Japonica,' but though it is stated to have only five gill-rays, I cannot help thinking that its true affinities are with the Barbiers, and its dentition is indeed exactly similar to that of the *Tang* or *Taa*, a South Australian *Serranus*.

Hab. Japanese seas.

CENTROPRISTES HIRUNDINACEUS, C. et V. vii. p. 450; Temm. et Schl. F. J. Sieb. p. 14. pl. 5. f. 1.

Hab. Sea of Japan.

AULOCOCEPHALUS, Temm. et Schl. F. J. Sieb. p. 15. pl. 5. f. 2.

The British Museum possesses two examples of this fish from the Mauritius.

Hab. The coasts of the Mauritius and the Japanese sea.

GLAUCOSOMA BÜRGERI, Temm. et Schl. F. J. Sieb. p. 62. pl. 27; Richardson, Ichth. of Voy. of Erebus and Terror, p. 27.

The discovery in the Australian seas of a second species of this genus has rendered a specific appellation necessary for the Japanese one, and we have named it in honour of Bürger, whose description and drawing are the authorities for the species.

Hab. Sea of Japan.

Fam. THERAPONINÆ.

HAPALOGENYS NITENS, Richardson, Ichth. of Voy. of Sulph. p. 84. pl. 43. f. 1 & 2; *Icon.* Reeves, 92; Hardw. Acanth. 164, 165. Chinese name, *Yin pe lä* (Reeves); *Yan pi lap* (Bridgem. Chrest. 101).

The specimen from which Mr. Reeves's drawing was made was deposited by that gentleman in the British Museum.

Hab. China sea. Canton.

HAPALOGENYS ANALIS, Richardson, Ichth. of Voy. of Sulph. p. 85. pl. 43. f. 3; *Icon.* Reeves, 91; Hardw. Acanth. 167. *Pristipome mucronè*, Eydoux et Souleyet. t. . f. 1. Chinese name, *Shih tseu* (Birch); *Shi kea ha* (Reeves); *Shik kip lap* (Bridgem. Chrest. 97).

Mr. Reeves's specimen of this fish also is in the British Museum.

Hab. Sea of China. Canton.

HAPALOGENYS MACULATUS, Richardson. *Icon.* Reeves, a. 49; Hardw. Acanth. 42. Chinese name, *Kin sih* (Reeves); *Kin fung*, "Gold-wind" (Birch). *Rad.* D. 11|15; A. 3|9; C. 17 $\frac{2}{3}$; P. 16; V. 1|5.

In general form and in the distribution of its coloured bands and spots, this species bears a singular resemblance to *Diagramma cinctum*, as has been already noticed (*supra*, p. 226). Body thickest a little below the arched lateral line, and thinning off above to the acute nape and dorsal line. The belly is obtuse, and the top of the cranium widens gradually until it becomes flat between the fore parts of the orbits. Chin and edge of the lower jaw covered by a soft papillose lip; upper lip less coarsely papillose. Four small pores on the chin and two on each limb of the lower jaw, whose articulation is under the fore part of the orbit. Jaw-teeth villiform, the outer row short-conical and acute. Roof of the mouth toothless, lined with plaited, villous membranes, the villi being densely crowded behind the crescentic velum.

Maxillary truncated with a small point at the fore corner. Preoperculum strongly and

rather widely toothed on both limbs, the teeth at the corner coarser. Gill-cover short and triangular, with a sub-acute, triangular bony tip, and an oblique, acute notch above it. No scales on the lower jaw, but the fore part of the maxillary and the preorbital and suborbital chain, with the rest of the side of the head up to the extreme edges of the gill-cover, are finely scaly. Supra-scapular spinously toothed.

The scales are rough like those of a *Priacanthus*. The lateral line is arched under the third dorsal spine, when it descends, and is a little undulated under the soft dorsal. No scales on the spinous dorsal; but the bases of the soft dorsal, anal, pectoral and caudal are scaly. A stout recumbent spine precedes the soft dorsal. Second anal spine much stronger and larger than the third, which does not much exceed the first one.

Scales generally bright and silvery: a bright silvery border edges the lower part of the operculum, and the cheek is also bright, but the rest of the head has a dark neutral tint or bluish-gray. The upper half of the body, the tail and the vertical fins are marked by round spots of the same. There is also a bluish-gray band on the hind head, another descending from the nape to behind the pectoral, and a third, descending from the anterior half of the spinous dorsal, curves when it reaches the lateral line backwards along the tail, much like the curved band of *Diachope sebæ*. The ground colour of the pectorals, spinous, dorsal and caudal is sienna- or ochre-yellow; that of the soft dorsal and anal olive-green. Ventrals hair-brown, edged like the spinous dorsal with brownish-black. Length $4\frac{1}{2}$ inches.

Hab. China seas. Canton. (Spec. Brit. Mus.)

HAPALOGENYS NIGRIPINNIS, Temm. et Schl. (*Pogonias*); F. J. Sieb. p. 59. pl. 25. *Rad.* B. 6; D. 11|16 vel 17; A. 3|8 vel 9, &c.

A specimen of Bürger's in the British Museum, which is doubtless an example of this species, though it was labelled when received from Berlin *Pogonias melanopterus*, differs from the figure in the 'Fauna Japonica,' in having a rather less concave profile and a somewhat differently shaped profile. It has a recumbent spine before the dorsal, which is not noticed by its describers, and the scales which partially cover the dorsal are omitted in the figure they have given. The species differs from the other members of the genus named above, in the papillæ of the under-lip being sufficiently elongated to produce a beard, and it therefore stands in the same relation to them that *Pogonias* does to *Micropogon*.

Hab. Japanese sea.

ANOPLUS BANJOS, Temm. et Schl. F. J. p. 17. pl. 8. *Banjos*, Voy. de Kru-senst. pl. 54. f. 1. *Rad.* D. 10|12; A. 3|7; C. 17 $\frac{1}{3}$; V. 1|5. (Bürger's Spec.)

The conjectures of the authors of this genus, that the *Coius polota* of Buchanan and Hamilton is a second species, have been found to be correct by Edward Blyth, Esq., who has ascertained that the Indian fish wants the recumbent dorsal spine of *Hapalogenys*. The *Coius binotatus*, Gray, Hardw. Illustr., is said by Mr. Blyth to be merely a variety of *polota*. A Japanese species of *Anoplus* collected by Bürger exists in the British Museum.

Hab. Sea of Japan.

SCOLOPSIDES RUPELII, C. et V. v. p. 332. *Sc. kurite*, Rüppell, Atl. p. 3. taf. 2. fig. 3; *Icon.* Reeves, 47; Hardw. Acanth. 48. Chinese name, *Hung hae tsih*, "Red sea-rule" (Reeves, Birch). *Rad.* D. 10|9; A. 3|7; P. 17, &c. (Spec. Br. Mus.)

The differences between this fish and *Scolopsides kate* (C. et V. v. p. 329; Bl. 325. f. 2) appear to be extremely slight, or at least they are not very clearly exposed in the 'Histoire des Poissons.' Bloch says that his specimen came from the sea of Japan, and it is highly probable that he had the *rupelii* before him even if the Malabar *kate* be a distinct species. The British Museum possesses a Chinese specimen of *rupelii*, presented by Mr. Reeves. Villiform teeth, long and slender. Two suborbital teeth pointing backwards, one under the other and more slender; none pointing forwards. A small angle of bone on the edge of the operculum, not spinous.

Hab. Red sea and seas of China and Japan.

SCOLOPSIDES INERMIS, Temm. et Schl. F. J. Sieb. p. 63. pl. 28; *Icon.* Reeves, 262; Hardw. Acanth. 57. *Rad.* D. 10|9; A. 3|7; C. 17; P. 18; V. 1|5. (Spec. Br. Mus.)

The British Museum has Mr. Reeves's specimen of this fish. The drawing differs from the

figure in the 'Fauna Japonica,' just as a recent specimen from one that has become flaccid in spirits and lost its plumpness and height. The vertical bands are also fainter in the drawing, and the fins have a deep saffron-yellow or Dutch-orange colour instead of the pale primrose tint shown in the 'Fauna Japonica.' Teeth villiform with an outer row of stouter ones. Lower jaw teeth shorter. A very minute bony point on the edge of the gill-cover. A flat, acute, suborbital tooth, with a point beneath its base. Edge of the suborbital under the posterior third of the orbit strongly serrated. We have seen a drawing of a *Scolopsides*, executed at the islands of Houtman's Abrolhos, on the west coast of Australia, by Lieut. Emery, of the Royal Navy, which strongly resembles this fish; but the fins have only a yellow border and are otherwise colourless.

Hab. Seas of China and Japan.

SCOLOPSIDES POMOTIS, Richardson. *Icon.* Reeves, β . 15; Hardw. Acanth. Chinese names, *Shih kei*, "Stone robber" (Reeves); *Shih tsei* (Birch).

Though this drawing does not exhibit the peculiar suborbital tooth of the genus, I am induced, in the absence of specimens, from its near resemblance to the preceding two species, to refer it to *Scolopsides*; and if this reference be correct, it possesses specific marks in the jet black tip of the gill-cover, and in a black speck on the base of the upper pectoral ray. It has the yellow fins and bright carmine spot on the gill-cover of the preceding species; but its back is browner and its profile undulated. Length of the drawing 6 inches.

Hab. Chinese sea. Canton.

LOBOTES INCURVUS, Richardson. *Icon.* Reeves, 168; Hardw. Acanth. 76. *Rad.* D. 12|15; A. 3|11; P. 17, &c. (Spec. Br. Mus.)

This fish has the blackish hue of *Lobotes farkarii*, but not the orange-coloured fins, and it has a more deeply incurved profile and higher fins than any species described in the 'Histoire des Poissons.'

Head scaly to orbit and forward on the cheek to the angle of the mouth, also the disc of the preoperculum. Edge of this bone spinosely dentate all round. Gill-cover, with a rounded projecting bony point and no sinus above it, scaly to the edge. Supra axillary plates of coracoid bone with fourteen teeth. Soft dorsal, anal caudal and base of pectoral scaly. Spines strongly striated. Outer row of teeth subulato-conical, inclined backwards, rather taller on the sides of the lower jaw. Within the upper jaw a narrow band of granular teeth. On the lower jaw the interior teeth are in a single row and very minute. In the drawing the sides and head are densely clouded with blackish purple mixed on the base of the fins, and towards the lower parts with siskin-green. The soft dorsal, anal and caudal are blacker, and the latter is edged obscurely above and below with yellow or pale green. The pectoral is clay-coloured; the ventrals and spinous dorsal clouded with neutral tint. Length 12 inches.

Hab. China seas. Canton.

LOBOTES CITRINUS, Richardson. *Icon.* Reeves, 191; Hardw. Acanth. 168.

This species has the pale bar on the extremity of the caudal fin and some other colours ascribed to *Lobotes erate* in the 'Histoire des Poissons,' particularly to the specimens which M. Dussumier brought from the coast of Malabar (v. p. 323); but the height of the body is greater, being equal to half the length of the fish, caudal fin excluded, and I have therefore thought it expedient to give it a provisional specific name. The Chinese collection at Hyde Park contains specimens which I have very cursorily examined. The ground colour in Mr. Reeves's drawing is dull lemon-yellow, with obscure purplish clouding, a purplish black shading round the eye, on the tip of the gill-cover, the nape and bases of the vertical fins and pectorals. The pectorals are pale and transparent, the rest of the fins are blackish, more or less clouded, and the soft dorsal and anal are bordered with buff-orange.

Hab. China seas. Canton.

PRIACANTHUS BENMEBARI, Temm. et Schl. F. J. Sieb. p. 19. pl. 7. f. 1. Krusenst. 53. f. 2. *Rad.* D. 10|13; A. 3|14; C. 16 $\frac{3}{4}$; P. 19; V. 1|5.

The British Museum possesses two of Bürger's Japanese specimens. In them the end of the caudal is concave, not convex, as in the figure in the 'Fauna Japonica;' and the scales are not so rough as in most other species.

Hab. Sea of Japan.

PRIACANTHUS TAYENUS, Richardson. *Icon.* Reeves, β . 14; Hardw. Acanth.

36. Chinese name, *Ta yen lap*, "Large-eyed lap" (Reeves); *Tai gans lap* (Bridgem. Chrest. 129). *Rad.* D. 9 vel 10|12; A. 3|12 vel 13; C. 16 $\frac{1}{4}$; P. 19.

There is some difficulty in discovering ready characters by which the *Priacanthi* may be distinguished from one another. In the published descriptions much stress has been laid on the form and size of the angular projection of the preoperculum, but this varies greatly on different sides of the same individual, and in the 'Fauna Japonica' it is stated that there is a variation in this part as well as in the relative size of the fins, depending on the age of the individual. The fish at present under consideration may perhaps eventually prove to belong to the preceding species, should the elongation of the tips of the caudal and peak of the dorsal be discovered to be merely a sexual peculiarity or the more perfect state of the fish. One specimen exists in the museum of the Cambridge Philosophical Society, to which it was presented by the Rev. George Vachell, and another in the British Museum, received from John Reeves, Esq., both obtained at Canton.

Eye fully as large as in *boops*, interfering a little with the profile, and not much above half a diameter from the end of the snout. Height of body equal to one-fourth of the total length; suborbital chain presenting small knobs round the margin of the orbit, crenated on the lower edge; preorbital narrow and toothed. In both specimens the preopercular spine is long, tapering, and acute on one side and comparatively short on the other, and its serratures are not uniform; the operculum has a very small spinous point, which is the tip of a short ridge; the fourth soft ray of the dorsal is lengthened into a short filiform tip, the posterior corner of the fin being rounded; the anal is much rounded and about half the height of the body; caudal forked, with the tips acute and lengthened, particularly the upper one in Mr. Reeves's specimen; but in Mr. Vachell's, the upper tip only is a little larger than the rest of the fin, and is nearly straight on the edge; pectoral considerably smaller than in *bennebari*, and rounded; ventrals large; the scales silvery and bright. In the figure a bright carmine colour runs along the base of the dorsal, and gradually fades away as it descends the sides, which are silvery; the same is the case on the head; a faint roseate tint spreads over the dorsal, the edge being deeper; the anal and ventrals are pale blue, the latter being rose-coloured towards the edges, and marked by about eight rows of brown spots, with two larger round ones in the membrane which connects the last ray with the belly as far as the anus; and the pectorals and caudal are siskin-green and rose-coloured. One specimen 4 $\frac{3}{4}$ inches, the other 9 $\frac{1}{4}$ inches.

The *Priacanthus speculum* of the Seychelle islands is stated in the 'Histoire des Poissons' (vii. p. 471) to be readily distinguished from other species by its forked caudal. We are prevented from considering it as identical with the Chinese fish, by the eye being a full diameter of the orbit from the edge of the snout, the extreme smallness of the preopercular point, and the absence of the round spots on the pectoral. In the latter character *tayenus* agrees more nearly though not perfectly with *bennebari*. In the angular or pointed dorsal it resembles *japonicus*.

Hab. Chinese sea. Canton.

PRIACANTHUS DUBIUS, Temm. et Schl. F. J. Sieb. p. 19.

Hab. Sea of Japan.

PRIACANTHUS JAPONICUS, C. et V. iii. p. 106. pl. 50; Temm. et Schl. F. J. Sieb. p. 20.

Hab. Japanese sea.

PRIACANTHUS NIPHONIUS, C. et V. iii. p. 107; Temm. et Schl. F. J. Sieb. p. 21. *Rad.* D. 10|12; A. 3|10; &c. (Bürger's spec.)

One of Bürger's specimens is in the British Museum. Scales much rougher than those of *bennebari*. In the roughness and general character of the scales *Priacanthus* approaches to the *Myripristidæ*.

THERAPON THERAPS, C. et V. iii. p. 129. et vii. p. 475. pl. 53; Richardson, Ann. Nat. Hist. ix. p. 126. *Pterapon trivittatus*, Gray, Hardw. Ill.; Icon. Reeves, a. 43; Hardw. Acanth. 49. Chinese name, *Ketseë tsze* (Birch); *Kim sih* (Reeves); Aborigines of Port Essington, *At a goorn* (Gilbert).

Hab. Seychelles, Indian ocean, Torres Straits, Javan and Chinese seas.

THERAPON SERVUS, Bloch (*Holocentrus*), 238; C. et V. iii. p. 125; Richard. Ann. Nat. Hist. ix. p. 126. *Grammistes servus*, Bl. Schn. p. 185. *Sciæna*

jarbua, Shaw, Gen. Zool. iv. p. 541; *Icon.* Reeves, β . 44; Hardw. Acanth. Chinese name, *Ting kun yu*, "Nail-fish" (Reeves); *Ting kung u* (Bridgem. Chrest. 130).

Some of the Chinese specimens of this fish in the British Museum possess all the characters ascribed to *servus*, others seem to be intermediate between this species, *theraps* and *oxyrhynchus*; so that it is difficult to decide on the species to which they ought to be referred.

Hab. Red sea, Indian ocean, north-west coast of Australia, Javan sea, Torres Straits, the Moluccas and Chinese sea.

THERAPON OXYRHYNCHUS, Temm. et Schleg. F. J. Sieb. p. 16. pl. 6. f. 3; *Icon.* Reeves, 193; Hardw. Acanth. 70. Chinese name, *Shih keö tsee*, "Stony-horned tsee" (Birch); *Shih koh tsih*, "Strong-horned tsih" (Reeves, Bridgem. Chrest. 131).

The brown lines in Mr. Reeves's figure resemble those of *Th. ghebul*, Ehrenberg. Several examples exist in the Chinese collection at Hyde Park, and there is one in the museum at Haslar, which was obtained near Canton by Captain Dawkins of the Royal Navy.

Hab. Coasts of China and Japan.

THERAPON QUADRILINEATUS, Bloch (*Holocentrus*), 239. f. 2.; C. et V. iii. p. 134; *Icon.* Reeves, β . 34; Hardw. Acanth. Chinese name, *Chang ko po* (Reeves); *Cheung ko po* (Bridgem. Chrest. 136).

Hab. Chinese sea.

LATILUS ARGENTATUS, Cuv. et Val. v. p. 369. et ix. p. 495; Temm. et Schl. F. J. Sieb. p. 63. pl. 28. f. 2. *Coryphene chinoise*, Lacép. iii. p. 176 et 209. *Coryphæna sima*, Bl. Schn. p. 296; *Icon.* Reeves, 192; Hardw. Acanth. Chinese name, *Fang tow hwö*, "Square-headed hwo" (Birch); *Fang tow wuh*, "Square-head wuh" (Reeves); *Fang tow wah* (Bridgem. Chrest. 215).

Mr. Reeves's drawing has a pale purplish-red hue, but he has informed me that the recent tints of the fish had faded before it was submitted to the painter. It represents the form of a specimen of Bürger's in the British Museum better than the figure in the 'Fauna Japonica,' the caudal in the latter being more rounded.

Hab. Indian ocean and seas of China and Japan.

Fam. CIRRHITIDÆ (Gray).

CIRRHITES AUREUS, Temm. et Schl. p. 15. pl. 7. f. 2; *Icon.* Reeves, α . 16; Hardw. Acanth. 47. Chinese name, *Hwang gaou*, "Yellow gaou" (Reeves).

Mr. Reeves's drawing shows a fatty protuberance on the nape, overhanging the orbit, and a blackish patch on the gill-cover, which do not appear in the plate of the 'Fauna Japonica.' An example of the fish exists in the British Museum which agrees with Mr. Reeves's painting.

Hab. Chinese and Japanese seas.

CHEILODACTYLUS ZONATUS, C. et V. v. p. 365. pl. 129; Temm. et Schl. F. J. Sieb. p. 64. pl. 29. *Labre du Japon*, Krusenst. Voy. pl. 63. f. 1; *Icon.* Reeves, β . 43; Hardw. Acanth. Chinese name, *Ke kung yu*, "Cock fish" (Reeves, Birch); *Kai kung u* (Bridgem. Chrest. 124).

The British Museum possesses two of Bürger's specimens of this fish, and there are Chinese ones in the collection at Hyde Park, the form of which is better represented by Mr. Reeves's drawing than by the figure in the 'Fauna Japonica.'

Hab. Seas of China and Japan.

Fam. MÆNIDÆ.

GERRES EQUULA, Temm. et Schl. F. J. Sieb. p. 76. pl. 9. f. 1; *Icon.* Reeves, 215; Hardw. Acanth. 148. Chinese name, *Tswan tsuy*, "Boring mouth" (Reeves); "Boring lips" (Birch). *Rad.* D. 9|10; A. 3|7; C. 17 $\frac{2}{3}$; P. 16; V. 1|5. (Spec. Camb. Ph. Inst.)

The Rev. George Vachell has deposited a Canton specimen in the museum of the Cambridge Philosophical Society.

Hab. Seas of China and Japan.

GERRES PUNCTATUS, C. et V. vi. p. 480. *Woodan*, Russell, 68? *Icon.* Reeves, 260; *Hardw. Acanth.* 149. Chinese name, *Hae tsih* (Birch, Reeves); "Sea tsih" (Reeves).

Mr. Reeves's figure, probably from an oversight of the artist, shows four anal spines.

Hab. Indian ocean and China seas.

GERRES —? *Icon.* Reeves, β . 39; *Hardw. Acanth.*

This drawing evidently represents another species of *Gerres*, having less elongation of the anterior dorsal spines, and wanting the vertical faint purple bands; but the drawing is less precise in its details than in most others of this admirable collection, and in the absence of specimens we cannot ascertain whether it be a described species or not. Its Chinese appellation is the same with that of the *punctatus*.

Hab. China seas.

DITREMA, Temm. et Schl. F. J. Sieb. p. 77. pl. 40. f. 2. "*Rad.* B. 6; D. 10|22; A. 3|27; P. 19; C. 16; V. 1|5." (*Fauna Jap.*)

Hab. Sea of Japan.

CHÆTOPTERUS, Temm. et Schl. F. J. Sieb. p. 7. pl. 37. f. 2. "*Rad.* B. 4; D. 10|10; A. 3|8; C. 18; P. 17; V. 1|5." (*Fauna Jap.*)

Hab. Sea of Japan.

Fam. SPARIDÆ.

CHRYSOPHRYS ARIES, Temm. et Schl. F. J. Sieb. p. 67. pl. 31.

A Chinese specimen exists in the collection at Hyde Park. Incisors between chisel-shaped and conical.

Hab. Japanese and Chinese seas.

CHRYSOPHRYS TUMIFRONS, Temm. et Schl. F. J. Sieb. p. 70. pl. 34.

A specimen of Bürger's in the British Museum has the hind head less high, and the pre-orbital one-third lower than the figure in the 'Fauna Japonica.'

Hab. Sea of Japan.

CHRYSOPHRYS MAJOR, Temm. et Schl. F. J. Sieb. p. 71. pl. 35.

Hab. Sea of Japan.

CHRYSOPHRYS BERDA, Forskal (*Sparus*), p. 32; C. et V. vi. p. 113; Rüppell, *Neue Wirbel.* p. 120. taf. 27. f. 4. *Sparus hasta*, Bl. Schn. p. 275; *Icon.* Reeves, 223; *Hardw. Acanth.* 75. *Rad.* D. 11|11; A. 3|8, &c. (*Spec. Chin. coll.*)

Specimens of this fish exist in the Chinese collection at Hyde Park and in the British Museum, the latter brought from Canton by John Reeves, Esq. In Mr. Reeves's drawing the large pectoral is ochraceous, the rest of the fish gray, with a yellowish gloss on the belly, and the base of each scale blackish-gray. The lips are thick, and the fish has a sciænoid aspect. It is compared by Mr. Reeves with *Diagramma cinctum*.

Hab. Red sea, Indian ocean, and China.

CHRYSOPHRYS LONGISPINIS, C. et V. p. 116; Temm. et Schl. F. J. Sieb. p. 68. pl. 32.

One of Bürger's specimens in the British Museum has the preoperculum streaked on the disc and pectinately toothed on its vertical edge, the teeth bluntish, and concealed by membrane in the recent fish. A narrow, flat, blunt, bony point terminates the operculum behind the tip of the gill-flap. First anal spine very short, third one slender, second stouter and longer.

Hab. Sea of Japan.

CHRYSOPHRYS CARDINALIS, Lacép. (*Sparus*), iv. p. 141 ; C. et V. vi. p. 130 ; Temm. et Schl. F. J. Sieb. p. 69. pl. 33 ; *Icon.* Reeves, 199 ; Hardw. Acanth. 46. Chinese name, *Kin sze lä**, "Gold-skein lä fish" (Birch) ; *Kum sze lap* (Reeves) ; *Kum su lap* (Bridgem. Chrest. 212). *Rad.* D. 12|10 ; A. 3|9 ; C. 17 ; P. 14 ; V. 1|5. (Spec. Brit. Mus.)

Mr. Reeves has deposited a Canton specimen 7 inches long in the British Museum, and there are several in the Chinese collection at Hyde Park. A small, slightly pungent opercular point. Nuchal scales scarcely to be distinguished from the others. Three pits on each limb of the lower jaw. Preorbital equal in height and breadth.

Hab. Chinese and Japanese seas.

CHRYSOPHRYS —? *Icon.* Reeves, 95 ; Hardw. Acanth. 59. Chinese name, *Kam tze na*, "Gold-threaded robe" (Reeves) ; *Kam sze nap* (Bridgem. Chrest. 100). *Rad.* D. 12|11 ; A. 3|8 ; P. 13, &c. (Reeves's figure.)

This figure looks very much like a second representation of *cardinalis*, the only differences I can perceive being its rather larger head, the third anal spine rather shorter than the second one, and the serratures of the supra-scapular more strongly marked ; it has moreover yellow not roseate pectorals, pale angular marks on the spinous dorsal, and wants the superciliary green streak represented in the drawing of *cardinalis*.

Hab. China. Canton.

CHRYSOPHRYS AURIPES, Richardson. *Icon.* Reeves, 128 ; Hardw. Acanth. 58. Chinese name *Kin tze lä*, "Gold thread lä fish" (Birch, Reeves). *Rad.* D. 11|11 ; A. 3|8 ; C. 17 $\frac{5}{8}$; P. 15 ; V. 1|5. (Spec. Br. Mus.)

A Canton specimen of this fish, presented to the British Museum by Mr. Reeves, has three longish, subulate, somewhat incurved teeth on each intermaxillary, and five rows of small upper molars, the interior rows being short, and the last three teeth of the third row bigger than the rest, but not exceeding swan-shot ; there is the usual crowd of small teeth behind the incisors, and four rows of the lower molars. Preorbital twice as long as it is high. Preopercular disc faintly striated. Operculum ending in a small flat truncated point, with the bone sloped away above and below, where the edge is more concave than above. A row of crenated and striated, but not very conspicuous nuchal scales. The dorsal spines swell out on alternate sides, and the second anal spine is longer and stronger than the third one, which equals the soft rays. The height of the body is contained two times and a half in the total length, and the profile rises with little convexity and no undulation from the upper lip to the dorsal. The falcate pectoral, which is rather too short in the figure, reaches to the anal. The colour is brightly silvery, with ash-gray shadings on the base of the scales. The dorsal and upper half of the caudal are also gray with darker shadings on their borders. The lower half of the caudal and the other fins are saffron-yellow. Length of figure 7 $\frac{1}{2}$ inches.

Hab. Chinese seas. Canton.

CHRYSOPHRYS XANTHOPODA, Richardson. *Icon.* Reeves, 85 ; Hardw. Acanth. 61. Chinese name, *Hwang yih* (Birch) ; *Hwang yih*, "Yellow fin" (Reeves) ; *Wong yi* (Bridgem. Chrest. 221). *Rad.* D. 11|11 ; A. 3|9 ; P. 15, &c. (Spec. Br. Mus.)

Mr. Reeves has deposited a specimen of this fish also in the British Museum. In form it is very similar to the last, except that the profile bulges a little at the orbit. The colours also are nearly the same, the back showing merely a deeper tint of yellowish-gray with some green on the nape and parts of the head ; the yellow of the lower fins also is more vivid. The specimen has only two short conical canines on each intermaxillary and five rows of molars, the largest, which are those of the middle row, not exceeding partridge-shot. The canines are very short in the lower jaw, and there are only three rows of molars to be clearly made out. Preorbital as in *auripes*, and with a thin papyraceous edge. Preoperculum striated on the disc, and minutely but regularly serrated along the upper limb. Flat point of the operculum rather more prominent than in *auripes*, and much like the corresponding point in a *Scolopsides*. Middle anal spine long and strong as in *auripes*, and the pectoral long. Length of the figure 8 $\frac{1}{2}$ inches.

Both the preceding species have the colours of the *Chitchillee* of Russell, plate 91

* This character, as written on the drawing here and in the following places, is pronounced *cha* (Morrison, Dict. i. part 2, No. 32), but Bridgem. Chrest. substitutes *lä*.

(*Chrysophrys chrysargyra*, C. et V.); but in that figure the third anal spine is larger than the second, the soft rays of the fin are more numerous, and the profile is more arched.

Hab. China seas. Canton.

PAGRUS UNICOLOR, Quoy et Gaim. (*Chrysophrys*), *Voy. de l'Uranie*, p. 299; C. et V. vi. p. 162; *Icon.* Reeves, 160; *Hardw. Acanth.* 41. Chinese name, *Hung lă*, "Red la" (Reeves); *Hung lap* (Bridgem. *Chrest.* 213). *Rad.* 12|10; A. 3|8; C. 15 $\frac{2}{5}$; V. 1|5. (Spec. Br. Mus.)

Specimens brought from Canton by John Reeves, Esq. and the Rev. George Vachell, exist in the British Museum and Cambridge Philosophical Institution. Surgeon R. A. Bankier, R. N., sent one to the Haslar Museum from Hong Kong. Third anal spine longer than second one.

Hab. China seas (Canton). Western Australia (King George's Sound).

DENTEX SETIGERUS, C. et V. vi. p. 253. *Spare chinois*, Lacép. iv. p. 46; Temm. et Schl. F. J. Sieb. p. 73. pl. 37. f. 1; *Icon.* Reeves, β . 58; *Hardw. Acanth.* 60. Chinese name, *Kin sze yu*, "Gold silk fish" (*Jap. Fish*, ii. p. 20); *Hung shan*, "Variegated red silk" (Birch); *Hung sam*, "Red jacket" (Reeves); *Hong sham* (Bridgem. *Chrest.* 66).

The British Museum possesses one of Bürger's specimens, and also one brought from Canton by John Reeves, Esq.

Hab. Coasts of China and Japan.

DENTEX GRISEUS, Temm. et Schl. F. J. Sieb. p. 72. pl. 36.

A specimen of Bürger's exists in the British Museum.

Hab. Japanese sea.

LETHRINUS HÆMATOPTERUS, Temm. et Schl. F. J. Sieb. p. 72. pl. 36; Richardson, *Zool. of Sulph.* p. 144. pl. 64. f. 1-3; *Icon.* Reeves, 232; *Hardw. Acanth.* 63. Chinese name, *Tsëjn tsuy lă*, "Dog-lipped lă" (Birch); *Tseen tsuy tso* (Reeves).

We have seen a specimen in the British Museum, brought from Canton by John Reeves, Esq., and one sent from Hong Kong by Surgeon R. A. Bankier, R.N.

Hab. Seas of Japan and China. Canton. Hong Kong.

LETHRINUS ANATARIUS, Richardson, *Zool. of Sulph. Voy.* p. 145. *Icon.* Reeves, 245; *Hardw. Acanth.* 55. Chinese name, *Go lă*, "Goose lă fish" (Birch); *Go tso*, "Goose tso" (Reeves).

Hab. Sea of China. Canton.

CRENIDENS PUNCTATUS, Gray (*Girella*), *Ill. Ind. Zool. Hardw.* pl. 98. f. 3, 4. *Icon.* Reeves, 79; *Hardw. Acanth.* 74. Chinese name, *Kwa tze lă*, "Melon lă fish" (Birch); *Kwa tze tso* (Reeves). *Rad.* B. 5? D. 14|13 vel 15|14; A. 3|11 ad 13; C. 15 $\frac{5}{5}$; P. 20; V. 1|5. (Spec. Br. Mus.)

Mr. Reeves deposited two specimens of this fish in the British Museum. Teeth curved, flat and expanding towards their ends, which are tricuspid, standing out in three rows on the margin of the jaw; and a little way behind them a brush-like band of much smaller teeth, which are also tricuspid, and like the others except in size. Preoperculum minutely serrated on the edge and radiately ridged on the disc. Lower part of gill-cover and suboperculum smooth and scaleless. Operculum ending in two thin, flat, widely separated corners. Scales strongly ptenoid, pale, with dark borders, and resembling melon-seed. The prevailing colour of Mr. Reeves's figure is umber-brown, deeper above the lateral line and on the dorsal fin. The other fins are blackish-gray, the pectoral having a yellow edge. The iris bright blue. Caudal even.

Hab. China. Canton.

CRENIDENS LEONINUS, Richardson. *Icon.* Reeves, 263; *Hardw. Acanth.* 73. *Shih tze tso*, "Stone lion tso" (Birch). *Rad.* D. 14|16; A. 3|12 vel 13, &c. (Reeves's fig.)

The general colour of the head and upper parts of this fish is apple-green, the belly gradually becoming faint tile-red. The green colour spreads over the scaly bases of the fins, their membranes are purple with a greenish gloss.

Hab. Canton.

CRENIDENS MELANICHTHYS, Temm. et Schl. F. J. Sieb. p. 75. pl. 39. *Icon.* Reeves, 247; Hardw. Acanth. 72. Chinese name, *Lüh yen ke*, "Green-eyed fowl" (Birch, Reeves). *Rad.* D. 14|14; A. 3|12; C. 17; P. 17; V. 1|5. (Fauna Jap. and Reeves's fig.)

The authors of the 'Fauna Japonica' have named this species as the type of a peculiar genus, but have not assigned any strong reason for separating it from *Crenidens*. They who agree with them in thinking that the group ought to be subdivided, should observe that Mr. Gray's generic name *Girella* is prior to the *Melanichthys* of the 'Fauna Japonica.' In Mr. Reeves's drawing the general colour is black and blackish-purple, with purer purple tints on the face. The caudal is glossed with purplish-brown, the soft dorsals, anal and pectorals, with deep blackish green, and the ventrals, spinous dorsal and spines of the anal, with auricular-purple. The eyes are green. These various shades of dark colours give a general blackish aspect to the fish. In the illumination of the figure in the 'Fauna Japonica' the colour is black, the greenish and purple tints being omitted, as they are in a drawing made by Deputy-Assistant Commissary General Neill, of *Crenidens tephrocops*, a Western-Australian fish, which agrees nearly in outline with the Japanese fish. (Ichth. Ereb. and Terror, pl. 41. f. 1, 2.) The Australian names are *Kowelany* and *Memon*.

Another Western-Australian fish, similar in profile, has the body thinning off like a wedge towards the belly, and is known to the settlers by the name of "Zebra-fish," on account of nine black vertical bars on the sides. Its local names are *Kgummul* and *Karraway*, "The striped."

A third Australian fish having the same local name of *Memon*, and another also of *Muddier*, has more of a *Scaroid* aspect than the preceding, but yet appears to be of the same genus. A scale which accompanies Mr. Neill's drawing has the same form and ptenoid structure with those of the preceding two Australian fish. The caudal is truncated, with the side-points projecting to the length of one-third of the fin, and the intermaxillaries and maxillaries? are set by a close row of large trenchant teeth. The colour is black, marbled with sky-blue and a brownish-red tint on the breast. The ventrals blackish-gray and blue; the other fins black. The figure is twenty-one inches long. Mr. Neill's drawings of these and many other Australian fish are contained in a volume which he presented to the British Museum. The 'Ichthyology of the Voyage of the Erebus and Terror' (p. 36, pl. 25. f. 2) contains a description and figure of *Crenidens triglyphus*, a Port Jackson fish which has the physiognomy of *Crenidens forskalii*, while the group of *Melanichthys* approaches more to the *Pomacentridæ* in general aspect.

Hab. Seas of Japan and China.

Fam. ACANTHURIDÆ.

AMPHACANTHUS MARGARITIFERUS, C. et V. x. p. 145. "*Chaetodon canaliculatus*, Park Lin. Tr. iii. p. 33. *Amph. canaliculatus*, Bl. Schn. p. 209" (Hist. des Pois. x. p. 146). *Amph. albo-punctatus*, Temm. et Schl. F. J. Sieb. p. 128. *Icon.* Reeves, 259; Hardw. Acanth. *Rad.* D. 13|10; A. 7|9; C. 17 $\frac{11}{11}$; P. 15; V. 2|3. (Spec. Camb. Ph. Inst.)

A specimen of this fish from Canton was presented to the Cambridge Philosophical Society by the Rev. George Vachell. The profile of the snout is somewhat gibbous before the eye. The teeth are deeply notched, the cusps unequal and crenated. The preoperculum is marked at its angle by three or four diverging furrows, and a few small scales are sunk in the integument of the cheek close to its bend. The lateral line is composed of a series of short simple tubes not very close. Eye rather large. The drawing is grass-green on the upper parts and on the dorsal and caudal fins, the colour fading to mountain-green and bluish-gray as it descends the sides. Many oval silvery spots are scattered over the sides. The spinous dorsal is narrowly edged with blackish-gray; there are dots of that colour on the rays, and the anal and ventrals are spotted or barred with the same. The pectorals are pale green at the base, passing into a clay colour on the disc of the fins. The belly and sides of the head have much silvery lustre. Length 7 inches. The green changes to brown in spirits.

Hab. Seas of China and Japan. Indian ocean.

AMPHACANTHUS FUSCESCENS, "Houttuyn, Mem. de Haerl. xx. p. 333;" C. et V. x. p. 156; Temm. et Schl. F. J. Sieb. p. 127. pl. 68. f. 1; *Icon.* Reeves, 115; Hardw. Acanth. 229. Chinese name, *Le mong* (Reeves); *Lai mang* (Bridgem. Chrest. 37). *Rad.* D. 13|10; A. 7|9; V. 2|3, &c.

A mounted and varnished specimen exists in the British Museum, which was brought from Canton by John Reeves, Esq.; and there is another example in the Chinese collection at Hyde

Park. The post-frontal is ridged in a radiated way and slightly cancellated, and no scales could be discovered through the varnish on the cheeks or temples. The teeth are strongly tricuspid, the larger middle lobe rounded and crenated, the lateral ones acute. In the drawing an accessory or binate anal spine is shown, and the same thing is noticed by Park in his description of *Amph. margaritiferus*. The body is clouded with umber-brown and silvery blotches, occupying nearly equal space, but a dark tint prevailing on the back. On the flanks and tail there are besides many small silvery dots. The throat is umber-brown, and the sides of the head are umber-brown and olive-green, shading into each other. The caudal, soft dorsal, posterior half of the spinous part and soft anal are chestnut-brown. A cream-yellow stripe runs along the base of the anal. The ventrals, fore-part of the dorsal, and spinous portion of the anal are bluish-gray, and the pectorals straw-yellow with an umber-brown blotch on the base. Length 10 inches.

Hab. Seas of China and Japan. Canton.

AMPHACANTHUS AURANTIACUS, Temm. et Schleg. F. J. Sieb. p. 128. pl. 68. f. 2.

Hab. Sea of Japan; rare.

ACANTHURUS ORBICULARIS, Quoy et Gaim.; C. et V. x. p. 237.

The scales or cuticular ridges on the edge of the thorax, from the gill-openings to the ventrals, are serrated by fine, acute teeth pointing backwards. A specimen exists in Haslar Museum.

Hab. Chinese Sea (Sir Edward Belcher). Guam (Hist. des Pois.).

NASEUS FRONTICORNIS, "Commerson;" C. et V. x. p. 259; Temm. et Schl. F. J. Sieb. p. 129. pl. 69. *Harpurus monoceros*, J. R. Forst. Descr. An. ed. Licht. p. 219; *Icon.* G. Forster, Bib. Banks, 194. *Monocerus biaculeatus*, Bl. Schn. p. 180. *Naseus longicornis*, Guer.; *Icon. Règ. An.* pl. 35. f. 31. "Name at Waigiou, *Een-raw*; at Otaheiti, *E-ooma*," Forster.

Hab. Chinese and Japanese seas. Sandwich islands (Webber). Polynesia. Guam.

In Sir Edward Belcher's collection there are several species of *Acanthuridæ*, among which is an adult *Naseus brevirostris*, and also specimens of *Naseus lituratus*, some of which may have been collected in China; but as this officer visited New Guinea, which has been recorded previously as the native place of these fish, and he put fish from various localities into the same jars, we are unable to affirm that any of these specimens are Chinese.

PRIONURUS SCALPRUM, C. et V. x. p. 298; Temm. et Schl. F. J. Sieb. p. 129. pl. 70; *Icon.* Reeves, 183; Hardw. *Acanth.* Chinese name, *Hih tseang keun*, "Black general" (Birch); *Hak tseang keun tsang*, "Black *tseang keun* (a military officer)" Reeves. (Spec. Br. Mus.)

General colour blackish-purple, paler towards the belly, the fins blacker, and a narrow reddish streak from the angle of the mouth to the preoperculum.

Hab. Chinese and Japanese seas.

Fam. CHÆTODONTIDÆ.

PIMELEPTERUS INDICUS, Kuhl et Van Hasselt, in C. et V. vii. p. 270; Temm. et Schl. F. J. Sieb. p. 86. "Rad. D. 11|12; A. 3|11," &c. (F. J.)

Hab. Indian ocean. Sea of Japan.

PEMPHERIS MOLUCA, C. et V. vii. p. 306; Temm. et Schl. F. J. Sieb. p. 85. pl. 44. f. 3.

Hab. The seas of Japan and the Moluccas.

HYPSINOTUS, Temm. et Schl. F. J. Sieb. p. 84. pl. 42. f. 2.

I possess a drawing of a fish caught in the Bight of Benin by Dr. Thompson of the Royal Navy, which has the exact profile, the position of the ventrals and general appearance of M. Bürger's figure published in the 'Fauna Japonica,' except that the ventrals have the red colour of the rest of the fish.

Hab. Sea of Japan.

DREPANE PUNCTATA, Lin. (*Chætodon*), C. et V. vii. p. 132. *Chætodon*

punctatus, Solander; *Icon.* 21. Parkinson, Bib. Banks. *Lattè*, Russell, 79; *Icon.* Reeves, 51; Hardw. 162. Chinese name, *Ke lung tsang*, "Coop tsang fish" (Birch); "Fowl-basket" (Reeves).

Hab. Round the entire coasts of Australia and New Guinea, and in the Javan and China seas, and the Indian ocean.

DREPANE LONGIMANA, Bl. Schn. (*Chatodon*), p. 231; C. et V. vii. p. 133.

Terla, Russell, 80-81; *Icon.* Reeves, 241; Hardw. Acanth. 159. Chinese name, *Lew tsang*, "Willow sang" (Birch); "Willow dory" (Reeves). *Rad.* D. 9|21; A. 3|19; C. 17 $\frac{6}{6}$; P. 17; V. 1|5. (Spec. Camb. Ph. Inst.)

The vertical bars which are described in the 'Histoire des Poissons,' from faded specimens, have a lively auricula-purple colour, and are eight in number. The Rev. George Vachell has deposited a Canton specimen in the Cambridge Philosophical Institution.

Hab. Indian ocean, Javan and China seas.

SCATOPHAGUS ARGUS, Lin. (*Chatodon*); C. et V. vii. p. 136. *Pool chitsilloo*, Russell, 78. *Icon.* Reeves, 272? Hardw. Acanth. 171? *Rad.* D. 11|17; A. 4|14, &c. (Spec. Camb. Ph. Inst.)

Two specimens of this fish exist in the Cambridge Philosophical Institution, which were brought from Canton by the Rev. George Vachell, and there are several in the Chinese collection at Hyde Park, all of which vary from one another in the size of the spots, which in some are bigger than the orbit, in others less. Mr. Reeves's drawing shows much larger spots, and a more concave and sloping profile than Russell's figure. The colour is also more purpurascens, sombre and dingy than it is described to be in the 'Histoire des Poissons,' so that it may possibly represent a distinct species.

Hab. India. China. Moluccas.

SCATOPHAGUS ORNATUS, C. et V. vii. p. 143. *Icon.* Reeves, β . 35; Hardw. Acanth. 169. Chinese name, *Kin koo*, "Metal drum" (Birch); *Kin koo*, "Golden drum" (Reeves).

Length of figure 2 $\frac{1}{2}$ inches.

Hab. China. Amboyna.

SCATOPHAGUS BOUGAINVILLII, C. et V. vii. p. 142? *Icon.* Reeves, 83; Hardw. Acanth. 172. Chinese name, *Lang pèen yu*, "Good flat fish" (Reeves, Birch).

This drawing has exactly the profile of Russell's figure of *argus*, but the dorsal spines are rather lower, and the second anal spine considerably larger than the others. The colour is lemon-yellow with a bright golden lustre, becoming silvery towards the belly, much of the head and parts of the fins being shaded by deep liver-brown. There are also some fainter large brown marks on the upper half of the body. In form this figure agrees with the description of *Bougainvillii*, of which the true colours and markings are not known, the specimen described in the 'Histoire des Poissons' having been badly preserved.

Hab. China.

EPHIPPIUS ORBIS, Bloch (*Chatodon*), 202, f. 2; C. et V. vii. p. 127; Lacépède, iv. p. 458 et 491; *Icon.* Reeves, 210; Hardw. Acanth. 157. Chinese name, *Yin kung* (Birch); *Ying kung* (Reeves); *Ngan kung* (Bridgem. Chrest. 30).

Hab. Indian ocean and China sea.

PLATAX EHRENBERGII, C. et V. vii. p. 221. *Platax vespertilio*, Whitch. Bennett, Ceylon, pl. 5; *Icon.* Reeves, 103; Hardw. Acanth. 179. Chinese name, *Fei yih*, "Flying wings" (Birch); *Fe yih*, "Flying fins" (Reeves); *Fi yih* (Bridgem. Chrest. 26).

Mr. Reeves's drawing has the yellow caudal fin with the dark brown bar on its base, and the precise dimensions of body and vertical fins which Bennett's figure possesses. It shows moreover the broad vertical bars, of which there is only a trace in the Ceylon plate, viz. an ocular band, a pectoral one, a broad one taking in the soft dorsal and anal, and the brown bar

on the base of the caudal, which makes a fourth. The yellow tints are not so general as they are shown by Mr. Bennett, being more confined to the breast.

Hab. Mauritius. Red sea. Indian ocean and China sea.

PLATAX VESPERTILIO, Bloch, 199; Temm. et Schl. F. J. Sieb. p. 83. pl. 43.

Platax blochii, C. et V. vii. p. 222.

The figure in the 'Fauna Japonica' wants an undulation in the arched part of the lateral line and the yellow caudal, with its *f*-shaped edge, which are shown in Mr. Reeves's figure of the preceding. The authors of the 'Fauna Japonica' consider their fish to be the true *vespertilio*, though there are some peculiarities of colour.

Hab. Mauritius. Indian ocean. New Guinea and China.

HÆNIOCHUS MACROLEPIDOTUS, Bloch, 200. f. 1 (*Chætodon*). C. et V. vii. p. 93; Temm. et Schl. p. 82. pl. 44. f. 1.

Hab. Sea of Japan. Moluccas. Celebes. New Guinea. Indian ocean, Mauritius and Mozambique.

HOLACANTHUS SEPTENTRIONALIS, Temm. et Schl. F. J. Sieb. p. 82. pl. 44; *Icon.* Reeves, 178; Hardw. Acanth. 175.

Mr. Reeves's drawing is illuminated with a rich orange-brown ground colour and pure china-blue stripes, which are broader than in the figure of the fish in the 'Fauna Japonica.' One stripe is bent into a ring on the operculum and another on the base of the pectoral. The soft dorsal and anal are blackish, the other fins reddish-orange.

Hab. Sea of China and Japan.

CHÆTODON AUREUS, Temm. et Schl. F. J. Sieb. p. 81. pl. 42. f. 1; *Icon.* Reeves, a. 23; Hardw. Acanth. 151. Chinese name, *Ho paou kin*, "Purse gold" (Birch); "Golden purse" (Reeves); *Ho pau kam* (Bridgem. Chrest. 25).

The *Chætodon collare* of Bloch (pl. 216. f. 1), which he says he had from Japan, appears to be this species. The profile, bands and numbers of the rays agree tolerably well.

Hab. Seas of China and Japan.

CHÆTODON SETIFER, Bloch, pl. 425. f. 1; C. et V. vii. p. 76.

Sir Edward Belcher obtained specimens of this fish in the outer China sea.

Hab. China sea. Moluccas, Polynesia, the Indian ocean, and Mozambique channel.

CHÆTODON MODESTUS, Temm. et Schl. F. J. Sieb. p. 80. pl. 41. f. 2; *Icon.* Reeves, β. 41; Hardw. Acanth. Chinese name, *Tsèen tsuy lă* (Birch); *Tseen tsui lap*, "Sharp-nose lap" (Reeves); *Tsim tsuy lap* (Bridgem. Chrest. 23).

Mr. Reeves kept a specimen of this fish alive for some weeks in a glass globe filled with sea water. There is a Japanese example in the British Museum.

Hab. Seas of China and Japan.

CHÆTODON STRIGATUS, Langsdorff. C. et V. vii. p. 25. pl. 170; Temm. et Schl. F. J. Sieb. p. 80. pl. 40. f. 1; *Icon.* Reeves, β. 4; Hardw. Acanth. 166. Chinese name, *Chae yu*, "Fuel-fish" (Birch); "Faggot-fish," from the resemblance of its stripes to a bundle of fire-wood (Reeves).

Mr. Reeves deposited a Canton specimen in the British Museum.

Hab. Seas of China and Japan.

PSETTUS ARGENTEUS, Lin. (*Chætodon*), Chin. Lagørstr. in Amœn. Ac. 1754. iv. p. 249. No. 26; Richardson, Ichth. of Voy. of Ereb. and Terror, pl. 35. f. 1-3. *Icon.* Reeves, 240; Hardw. Acanth. 226. Chinese name, *Yin leen tsang*, "Silver-scaled *tsang*" (Reeves, Birch). *Rad.* B. 6; D. 8|29; A. 3|29; C. 17 $\frac{2}{3}$; P. 17; V. 1|5.

Dr. J. O. M'Williams, the intrepid and scientific surgeon of the Niger expedition, presented two specimens of this fish to the Haslar Museum. He obtained them at Norfolk island.

Hab. Polynesia. East coast of Australia and sea of China. Canton (Reeves). Norfolk island (M'Williams). Vanicolo (Quoy et Gaimard).

HOPLEGNATHUS FASCIATUS, Temm. et Schl. (*Scarodon*), F. J. Sieb. p. 89. pl. 46. f. 1 and 2. Genus *Hoplegnathus*, Zool. Trans. vol. iii. p. 114; "*Poisson perroquet noir*, Krusenst. Voy. Atl. pl. 52. f. 2." "*Rad.* B. 7; D. 12|16; A. 3|13; C. 17; P. 18; V. 1|5." (Fauna Jap.)

I read an account of the genus *Hoplegnathus* before the Zoological Society, on the 9th of March, 1841, which was noticed shortly afterwards in the Zoological Proceedings, and subsequently published at length, with a figure, in the Zoological Transactions. A fasciculus of the 'Fauna Japonica,' which was published towards the end of the year 1844, gives an account of the same genus under the name of *Scarodon*, and mentions the earliest representation of a species in the Atlas of 'Krusenstern's Voyage.' The specimen described in the Zoological Transactions was supposed to be Australian, and differs from all the Chinese species in its more oblong form. I counted only five branchiostegous rays in the only example (a dried skin) which I had an opportunity of examining. The rays were as follows:—Br. 5? D. 12|12; A. 3|12; C. 15 $\frac{1}{2}$; P. 18; V. 1|5. The colour was gone.

Hab. Sea of Japan.

HOPLEGNATHUS PUNCTATUS, Temm. et Schl. (*Scarodon*), F. J. Sieb. p. 91; *Icon.* Reeves, a. 12; Hardw. Acanth. 308. Chinese name, *Hih shih la*, "Black stone lä" (Birch); *Hih shih tsoo* (Reeves).

Specimens of this fish exist in the Chinese collection at Hyde Park. I have also seen very cursorily, in the museum at Fort Pitt, a spotted *Hoplegnathus* from Norfolk Island, which seemed to be more oblong and of a lighter colour than this species.

Hab. Seas of Japan and China.

HOPLEGNATHUS MACULOSUS, *Icon.* Reeves, 270; Hardw. 173. (Spec. Chinese collection at Hyde Park.)

Not having examined the specimens in the Chinese collection and compared them with one another, this is propounded only provisionally as a separate species. In Mr. Reeves's drawings the spots are of two sizes, many smaller ones being scattered among others of the same dimensions with those of *punctatus*. More rays are shown in the soft dorsal and anal than in the figure of that species. The profile is less gibbous at the eyes, and the ventrals are smaller; but on the whole the two drawings are very much alike and may be both representations of one species.

Hab. Sea of China. Canton.

Fam. FISTULARIDÆ.

AULOSTOMA CHINENSIS, Bloch, 338 (*Fistularia*). *Fistularia sinensis*, Lacépède, v. p. 357.

Sir Edward Belcher has deposited a Chinese specimen of this fish in the museum at Haslar.

Hab. China seas. Polynesia.

FISTULARIA IMMACULATA, Commerson. Cuv. Règn. An. ii. p. 167. *Fistularia tabaccaria*, White's Voy. to Botany Bay, p. 2962. f. 2. *Icon.* Reeves, 185; Hardw. 315. Chinese name, *Ma peen yu*, "Horse-whip fish" (Reeves); *Ma pin* (Bridgem. Chrest. 52).

Three Chinese specimens of this fish exist in the British Museum.

Hab. China seas. Malay archipelago. Coasts of Australia.

AMPHISILE SCUTATA, Lin. (*Centriscus*). Bl. 123. f. 2. "Klein Mant. Ichth." Ruppell Neue Wirlb. 142.

Chinese specimens exist in the British Museum, Sir Edward Belcher's collection and in the Canton insect-boxes.

Hab. Chinese sea, Malay archipelago, Indian ocean and Red sea.

Tribus PERIODOPHARYNGEI.

Fam. MUGILIDÆ.

MUGIL JAPONICUS, Temm. et Schl. F. J. Sieb. p. 134. pl. 72. f. 1. *M. ce-*

phalotus, Cantor, Ann. and Mag. of Nat. Hist. xi. p. 29. Rad. D. 4|-1|8; A. 3|9; C. 14⁶/₆; P. 16; V. 1|5. (Cantor's Spec. Brit. Mus.)

Hab. Seas of Japan and China. Estuaries and canals (Cantor).

MUGIL (vel CESTRÆUS?) XANTHURUS, Richardson. Icon. Reeves, 127; Hardw. Acanth. 260. Chinese name, *Hwang wei tze*, "Yellow-tailed parer" (Birch); *Hwang ne tsae*, "Yellow-tailed" (Reeves); *Wong ne tsai* (Bridgem. Chrest. 117).

This Mullet has a close resemblance in form to *japonicus*, but as it is a little more slender and its colours differ, we have given it a distinct name. The snout is represented as projecting beyond the lower jaw, which shuts close up beneath it. The back is coloured pale leek-green, the sides and belly being silvery and pearly, with a short dark streak in the middle of each scale, making six or seven rows, none being perceptible below the middle of the fish. There are some hyacinth-red tints on the face and edges of the gill-pieces, and a pale-blue shading in the middle of the operculum. The pectoral is honey-yellow, very dark at the base and pale at the end. The membrane of the first dorsal is very pale-red lilac; the second dorsal is wood-brown; the ventrals and anal buff-orange, the latter having an opaque white bar at its base. The caudal is gamboge-yellow with a crimson border in the notch.

Hab. Sea of China. Canton.

MUGIL MELANCRANUS, Icon. Reeves, 73; Hardw. Acanth. 259. Chinese name, *Woo tow* (Birch); *Ootow*, "Black head" (Reeves); *Utaw* (Bridgem. Chrest. 119).

In Sir Edward Belcher's collection, which was formed chiefly in the China seas, though specimens from other parts of the ocean were mixed with the fish there taken, I find a *Mugil* having a close resemblance to Mr. Reeves's drawing above quoted, except that the belly is rather more prominent. The upper lip is more fleshy and the orifice of the mouth considerably larger than in *M. strongylocephalus*, exceeding the size of the orbit in both directions. The under lip is horizontal with a slightly notched keel, and the teeth, which penetrate it, are sufficiently visible to the naked eye. The slender maxillary is visible nearly for its whole length when the mouth is closed, but it scarcely projects beyond the preorbital, which has a straight front edge finely toothed, and ends in a point formed by a tooth larger than the rest. It is the tapering narrow form of this bone, and not a notch, which prevents it from concealing the maxillary. The length of the head and height of the body are equal, and rather exceed a fifth of the length of the fish. The pectorals are contained six times and three-quarters in the same length, and the lobes of the caudal four times and a third. The thickness at the gill-plates is equal to two-thirds of the height of the body, but under the first dorsal the thickness is less than half the height. There are thirty-seven scales in a row, besides some small ones on the caudal, and eleven rows under the first dorsal. Each scale has eight or ten fan-like furrows diverging from a small tube before the middle of the disc, and the free border of the scale is tessellated by worn teeth, which, though minute, show on the edge. There are none of the branching lines seen in the scale of *strongylocephalus*, in which also the only appearance of ptenoid structure is obscure and confined to the middle of the disc. The second dorsal and anal are scaly, and the latter commences a little sooner and ends a little further from the caudal. The caudal is also minutely scaly almost to the tips of its lobes. The top of the head is flat from the preoperculum forwards, but is much narrower than that of *macrolepidotus*; the nape is flatly rounded. There are the usual long scales at the first dorsal, above the pectoral and ventrals, and between the latter, but none of them are very conspicuous. The remains of a blue mark on the front base of the pectorals and a purple tint in the axilla are still visible in the specimen, which differs from *cæruleo-maculatus* and *axillaris* in the pectorals not being long or pointed.

In Mr. Reeves's drawing, the top of the head, a circle round the eye, and the borders of the gill-pieces are dark oil-green; the top of the back is greenish-gray, and the sides silvery, with a yellowish-gray line through the middle of each row of scales. The pectorals are ornamented with a blue mark on the scaly base, and the other fins are greenish-gray. Length of specimen 7.7 inches; from snout to gill-opening, 1.65 inch; to anus, 4 inches; to end of scales on base of caudal, 6.15. Height under the first dorsal, 7.55. Thickness at gill-plates, 0.95. Between the orbits, 0.65. Thickness of back under the first dorsal, 0.70 inch.

It is probable that this species is the Mullet referred to by Dr. Cantor as inhabiting the Peiho, and supposed by him to be the *Mugil parsia* of Buchanan Hamilton (Ganges, pl. 17. f. 21), Ann. Nat. Hist. ix. p. 15.

Hab. China seas? (Belcher). Canton (Reeves).

MUGIL HÆMATOCHEILUS, Temm. et Schl. F. J. Sieb. p. 135. pl. 62. f. 2. *Icon.* Reeves, β . 49; Hardw. Acanth. 262. Chinese name, *Keuen yu*, "Dog's fish" (Reeves, Birch).

Hab. Seas of China and Japan.

MUGIL MACROLEPIDOTUS, Rüppell, Atlas, p. 140, tafel. f. 2. *a. b.*; C. et V. xi. p. 136.

A specimen of this fish exists in Sir E. Belcher's collection.

Hab. Red sea (Rüppell). Polynesia and Indian ocean (C. et V.). China seas? (Belcher.)

MUGIL STRONGYLOCEPHALUS, Richardson.

The Haslar Museum possesses an example of this fish, procured at Hong Kong by Surgeon R. A. Bankier, R.N. The orifice of the extended mouth is small and triangular, the lips are thin with acute edges, the lower one being horizontal with a central notched keel. The teeth are invisible to the naked eye, but with a lens their points may be seen protruding through the edges of the lips like fine hairs. The jaws have considerable protractility, and when thrust out, the maxillaries are wholly seen; but when the mouth is retracted they are completely hidden. The preorbital is very narrow, with a rounded and finely toothed tip, behind which a smooth shallow groove turns round the edge of the bone, giving it a twisted appearance; but there is no distinct notch and no teeth on the fore-edge of the bone. In profile the fish has considerable resemblance to the *macrolepidotus* of Rüppell (Atlas, 35. f. 2), but when seen from above, its snout, though rounded, is much narrower, being little more than half as wide as the head is at the gill-covers. It differs from *cæruleo-maculatus* (C. et V. xi. p. 128) and its allies in not having a thick upper lip. The height of the body is to the whole length of the fish as 1 to $5\frac{1}{4}$; the thickness, which is greatest at the gill-plates, as 1 to 7.8; and the length of the head as 1 to 46. In profile the fish closely resembles *M. parsia* of Buchanan Hamilton (pl. 17. f. 21), and the curve is regular from the dorsal to the nostrils. When viewed from above, however, there appears a greater narrowness of the snout, which, though obtuse, has not more than half the width at the nostrils that it has at the gill-plates. The head is also much and evenly rounded off laterally, being in nowise flattened. It differs further from *parsia* in the maxillary being entirely concealed. The cleft of the shut mouth is bent *en chevron*, the angle being at the symphysis. An adipose substance, such as exists at certain seasons in the Mackerel, invests the temples and front of the eye, partially covering the preorbital and leaving a vertically elliptical part of the eye visible. Thirty-one scales form a row between the gill-opening and caudal, and there are ten rows in the height of the body. Each scale has from seven to twelve basal furrows with a corresponding number of crenatures, a small central tube with a fine line running back from it and branching off to the various furrows, and on the posterior or free border there are thirty or forty fine lines commencing near the tube and becoming fissures on the extreme edge, producing so many flat and extremely thin teeth set like those of a fine comb. The central tubes, when the scales are *in situ*, produce, in conjunction with the basal furrows which shine through, the appearance of as many lateral lines as there are rows of scales, causing the marks on each scale to appear compound, though they are really simple. On the head there are several scales which have each two or three contiguous deeply impressed furrows on their discs; these produce one row on each temple, and another on each side more interiorly, which are connected by a transverse row on the nape, and also by a cross row at the orbits. The anal commences a little before the dorsal, and also ends sooner, though it is a little larger. The difference of origin is not so great as in *M. parsia*. Neither of the fins are large, and they are both scaly. The first anal spine is so minute that it can be detected only by dissection. The fourth spine of the first dorsal is short and slender. There are pointed scaly processes over the pectorals and ventrals, and one between the latter fins. No peculiar markings remain on the specimen, which, except that the tips of the pectorals are broken, is in excellent condition. The scales are bright, and the whole fore-part back to the anus is dark bronze-coloured, more as if the fish had been stained by others in the same jar than like an original marking. There is no spot on the base of the pectoral. Length 7 inches; from snout to anus, 3.8 inches; to dorsal, 2.85 inches; to termination of scales on the tail, 5.75 inches. Length of head, 1.35 inch. Height of body, 1.5 inch. Thickness at gill-plates, 0.90 inch.

Hab. Sea of China. Hong Kong.

MUGIL VENTRICOSUS, Richardson. *Icon.* Reeves, β . 31; Hardw. Acanth. 261. Chinese name, *Pah tze*, "White mullet" (Reeves); *Pih tse*, "White parer" (Birch); *Patz tsai* (Bridgem. Chrest. 118).

This Mullet, which is known to us only by the figure, is remarkable for its slender-pointed

head, the prominent curve of its belly, and the thickness of the trunk of its tail. The underlip is shown as shutting in under the snout, and the form of the preorbital is not so distinctly defined as to enable us to place the species in its proper group. The height of the body is contained three times and a half in the total length, caudal included. The back is little elevated but is angular in profile, which rises in a gentle and slightly concave slope from the point of the snout to the first dorsal. From thence to the second dorsal the line is horizontal; and the rest of the upper profile to the base of the caudal is slightly concave. The under curve is boldly convex to the anus, from whence to the caudal the ascent is considerable and the curve concave. The second dorsal commences one-third of the length behind the beginning of the anal, and extends as far beyond it. The space between the anal and caudal exceeds the length of the anal. The caudal is acutely but not deeply notched.

On the back and upper part of the sides the discs of the scales are pale grass-green, their margins silvery, and the whole lower parts are pearly and silvery. The tubes of the scales are strongly marked down to the middle of the sides, producing rows. The mouth is hyacinth-red, the fore part of the gill-cover is buff-orange, and there is a patch of bright Berlin-blue at the upper angle of the gill-opening. The pectoral is dark brownish olive-green; the first dorsal red lilac-purple; the second dorsal and caudal mountain-green, the notch of the latter being edged with plum-purple; the membrane of the anal is pale mountain-green, its rays and a streak at its base being white. The rays of the ventrals are also opaque, white, with some carmine streaks on their tips, and the membrane is pale blue.

Hab. Chinese sea. Canton.

Fam. ANABANTIDÆ.

ANABAS SCANDENS, Daldorf (*Perca*), Lin. Tr. iii. p. 62; C. et V. vii. p. 325; Cantor, Ann. Nat. Hist. ix. p. 28. *Anthias testudineus*, Bl. 322. *Amphiprion testudineus* et *scansor*, Bl. Schn. p. 204. *Cephalopholis*, id. p. 570. *Lutjan tortue*, Lacép. iv. p. 192 et 235. *L. grimpeur*, ibid. p. 195 et 239. *Coius cobojius*, Buch. Ham. pl. 13. f. 33.

Hab. Chusan. Streamlets and canals (Dr. Cantor). Malacca. Celebes. Java. Indian peninsula.

POLYACANTHUS CHINENSIS, Bloch, 218, f. 1 (*Chatodon*); C. et V. vii. p. 357. *Chétodon chinois*, Lacép. iv. p. 461 et 496.

Hab. China.

POLYACANTHUS? PALUDOSUS, Descript. of Animals, Banks, Lib. MSS. No. 84, p. 167. fig. 101 (*Labrus*). *Rad.* B. 5; D. 7|8; A. 17|6; P. 10; V. 1|6. (Lib. citat.)

The anonymous author of the book quoted above has given a pen-and-ink sketch of a small fish taken by him in the ditches and stagnant pools of Danes Island in the river at Canton, and named by him *Labrus paludosus*. Broussonnet has referred it to the *L. opercularis* of Linnæus, but we think erroneously, as the numbers of the rays do not agree, the spines of the dorsal in particular differing widely. It seems to be either a *Polyacanthus* or *Macropodus*, and it differs from the described species of the latter in its cuneate tail and in the tips of the other two vertical fins being less elongated. Its form is oblong-linear; the height being contained five or six times in the total length; the head obtuse in profile, and the mouth at mid-height and terminal. The body tapers slightly to the semi-oval end of the tail, which is embraced by the pointed caudal. Body compressed and scaly, the back narrow. The second ray of the ventrals is stated to be very long by the author, but his figure represents it as not reaching beyond the anterior third of the anal. The colour is olive-green with ten transverse yellow bars, and there is a dark mark on the upper part of the gill-cover near its edge.

Hab. Canton.

POLYACANTHUS? OPERCULARIS, Lin. (*Labrus*), Ammœn. Acad. iv. p. 428. "*Rad.* D. 12|8; A. 15|13; C. 16; V. 1|5." (Linn.)

This fish is described as having its body extended nearly in form of a parallelogram with the soft rays of the dorsal and anal longer than the spines, and the ventrals with a thread-like point. The body is shining with more than ten cross brown bars, the head spotted above, and the tip of the gill-cover marked by a dark brown spot.

Hab. China.

The *Labrus linearis* of Lin., Am. Acad. i. p. 597, is considered by Cuvier as belonging

to this family. Its rays are B. 6; D. 20|1; A. 15; C. 12; P. 12; V. 2|4, the single soft dorsal ray being considered as anomalous among the *Acanthopterygii*.

MACROPODUS VIRIDI-AURATUS, Lacép. iii. p. 417. pl. 16. f. 1; C. et V. vii. p. 373.

Hab. China, Cochinchina.

MACROPODUS VENUSTUS, C. et V. vii. p. 375. *M. ocellatus*, Cantor, Ann. Nat. ix. p. 28? "*Rad.* B. 4; D. 17|8; A. 20|12; C. 12; P. 11; V. 1|5." (Cantor.)

Hab. Canton (Dussumier). Chusan (Cantor).

OSPHRONEMUS OLFAX, Commerson; C. et V. vii. p. 377. *Osphronème gourami*, Lacép. iii. p. 117. pl. 3. f. 2. *Trichopus goramy*, Shaw, iv. p. 388.

Hab. China. Java. Naturalised in the Isle of France and Cayenne.

OPHICEPHALUS MACULATUS, Lacépède (*Bostrychus*), iii. p. 140 et 143; C. et V. vii. p. 437; *Icon.* Reeves, 148 et β . 19; Hardw. 251. Chinese name, *Säng yu*, "Living fish" (Reeves, Birch, Bridgem. Chrest. 121). *Rad.* D. 42; A. 1|27; C. 22; P. 16; V. 1|5. (Spec. Camb. Phil. Inst.)

Height of body one-sixth of total length, and rather more than half the length of the head. Teeth short and densely villiform, or rather finely card-like, with a cluster of longer ones at the symphysis, as in the *Serrani*. A portion of the dental surface projects forward at the apex of the lower jaw, and the teeth of the exterior row there and at the sides of the jaw are stronger than the rest. The palatine bones are armed with stronger curved teeth, having smaller ones at their bases. Vomerine teeth small. Pharyngeal apparatus an oval cell capable of being closed by various lobes which spring from its borders. Scales ciliated, and strongly marked by curved streaks nearly parallel to their posterior edges. Lateral line interrupted over the anus, and commencing again on the second row of scales beneath, whence it runs straight to the end of the tail. Ground colour yellowish-brown, fading to broccoli-brown and bluish-gray on the belly. Large irregular blackish-brown spots in two or three rows on the sides, and ten or eleven round spots along the base of the dorsal, which becomes dark towards the edge, and in the figure shows obscurely three other rows of dark spots; these are effaced in the specimens. The anal also is dark on its outer half, and shows faintly a series of oblique bars. One blackish-brown stripe passes backwards from the eye along the temporal groove, and dilates on the side of the head and upper edge of the gill-cover; another crosses the cheek lower down, and passing over the lower border of the operculum, is continued to the base of the pectoral; the space between these is nearly filled by a paler umber-brown bar, which is bordered by the yellowish-brown ground colour. There are also blackish-brown spots and bars scattered over the nose, top of the head and jaws; and three imperfect bars on the pectorals. The caudal in fig. 148 is uniformly dark, with two transverse bars on its scaly base. In figure β . 19 the basal half of the caudal is straw-yellow, with four dark transverse bars, and the other vertical fins are also lighter with more definite bars. Length of specimen $5\frac{1}{2}$ inches; length from snout to anus, 2.45 inches; length of head, 1.6 inch; height of body, 0.9 inch.

There is a difference in the numbers of the fin-rays in Mr. Reeves's two figures.

The above description is drawn up of two specimens in the museum of the Cambridge Philosophical Institution, which were brought from Canton by the Rev. George Vachell. In the same institution are two rather larger specimens from the same quarter which do not differ in any essential point of structure, but present a series of bright silvery rhomboidal marks between the two principal rows of dark lateral spots, having, with them, a quincuncial arrangement. These bright places are not shown in either of Mr. Reeves's figures. There are series of pores in the temporal fossæ down the limb of the preoperculum and along the limbs of the lower jaw. The lateral line is interrupted over the anus, but there are as many rows of lines as there are scales, so that the proper continuation of the line is difficult to make out. Length of specimens $6\frac{1}{2}$ and $8\frac{1}{2}$ inches; rays of dorsal, 44; of anal, 1|28.

These Ophicephali are carried about the streets of Canton in tubs and are cut in pieces alive for sale.

Hab. Canton.

OPHICEPHALUS IRIS, C. et V. vii. p. 439.

Described from a Chinese painting brought from Canton by M. Dussumier. An azure-blue spot on the end of the tail.

Hab. Canton.

OPHICEPHALUS MILIARIS, C. et V. vii. p. 439.

Also described from a Chinese painting.

Hab. Canton.

OPHICEPHALUS ARGUS, Cantor, Ann. Nat. History, ix. p. 29. "*Rad.* B. 5; D. 49; A. 33; C. 14; P. 16; V. 1|5" (Cantor).

"Brownish-green back and sides, reddish-white abdomen; numerous black ocellated spots edged with white above the lateral line; fins yellow, spotted with black."—Cantor.

Hab. Chusan. Streamlets and estuaries.

OPHICEPHALUS GRANDINOSUS, C. et V. vii. p. 434.

Described from a painting executed at Canton.

Hab. Canton.

OPHICEPHALUS OCULATUS, Lacépède (*Bostrychoïdes*), iii. p. 144 et 145. *Ophicephalus ocellatus*, C. et V. vii. p. 454.

This species is very imperfectly known, and only from a Chinese painting.

Hab. China.

OPHICEPHALUS PUTICOLA, *Icon.* Reeves, 142; *Hardw.* 248. Chinese name, *Tsing kung yu*, "Well kung yu" (Reeves); *Ching kung u* (Bridgem. *Chrest.* 245).

As most of the Chinese *Ophicephali* have been described from drawings only, and the colours appear to vary with age and season, it is probable that there has been an undue multiplication of species; and the drawing now quoted may eventually prove to be referrible to the same species with Lacépède's *oculatus*, but his figure differs in form, and it is impossible to reconcile the two in the present state of our knowledge of the ichthyology of Canton.

Mr. Reeves's drawing of *puticola* presents a light oil-green colour along the back, gradually passing on the sides and belly into peach-blossom red; a pale apple-green bar deeper towards its edges covers the temples and operculum; and there are about eleven blackish-green bars on the sides, bent backwards *en chevron* in the middle, and fading away towards the belly. On the scaly base of the tail, above its middle, there is a round spot of the same blackish-green hue. The head behind the eyes, the whole of the sides, the lower half of the dorsal, and the basal half of the caudal, are thickly spotted with points and small lines of sienna-yellow. All the fins are broadly bordered with blackish-gray, the basal halves of the anal and dorsal being ochraceous, and of the pectorals and caudal approaching to hyacinth-red. The tubular margins of the anterior nasal openings are represented as unusually long; the caudal as much rounded, and the length as equal to six times and one-half the height of the body. D. 43; A. 34, &c. Length of figure $9\frac{1}{4}$ inches.

Hab. Canton.

OPHICEPHALUS JOVIS, *Icon.* Reeves, 143; *Hardw.* 249. Chinese name, *Luy kung yu*, "Thunder king's fish" (Birch, Reeves); *Lui kung u* (Bridgem. *Chrest.* 246).

As the young of *Oph. marulius* differs very greatly from the adult in its colours, so it is not impossible but this may be the young of the preceding. Its different Chinese designation, however, and very different tints of colour, induce us to name it as distinct.

The body is marked by ten or eleven blackish-green waved and forked bands, alternating with as many arterial blood-red ones; the two colours being about equal in quantity, either may be considered as the ground one. The top of the head is dark green; a dark green stripe which runs backwards from the eye and spreads over the gill-cover, is traversed part of the way by two red bars; and there is a red spot near the tip of the gill-flap. Some yellow points are scattered on the side of the head and along the flanks, but not nearly so copiously as in *puticola*. The caudal, dorsal and pectorals are broccoli-brown, without bars or spots. The anal is yellowish-brown at the base, marked along its middle by a narrow white riband, which is shaded above by blackish-gray passing into white, and finally, the edge of the fin is bluish-gray. The anterior nostrils are tubular, but the tubes are scarcely so long as those of *puticola*. The form of the fish otherwise is much the same as in that species. Length of figure nearly 6 inches.

Hab. Canton.

Tribus —?

Fam. POMACENTRIDÆ.

GLYPHISODON CÆLESTINUS, Solander (*Chætodon*), MSS. Bib. Banks; C. et V. v. p. 464; *Icon.* Parkins. Bib. Banks., 31; Reeves, 256; Hardw. 143. *Rad.* D. 13|12 ad 14; A. 2|11 vel 12, &c. (Spec. var.)

Specimens from China have been presented to the British Museum by John Reeves, Esq., and to Haslar Museum by Sir Edward Belcher and Capt. Dawkins, R.N.

The teeth are entire, chisel-shaped and trenchant in a single row.

Hab. Mozambique. Seychelles. Mauritius. Indian ocean. Polynesia and Chinese sea.

GLYPHISODON TYRWHITTI, Benn. Ceylon (*Chætodon*), pl. 25; *Icon.* Reeves, a. 31; Hardw. 144. *Rad.* D. 13|12; A. 2|11, &c. (Spec. Br. Mus.)

A specimen of this fish in the British Museum, brought from China by Mr. Reeves, can be distinguished from the preceding only by the teeth, which are those of a *Dascyllus*, and are villiform, with the front row stronger. It has not the aspect of a *Dascyllus*, nor the serrated preoperculum. It is not easy to say which of Mr. Reeves's drawings, a. 31 or 256, represents this fish best, but on the whole we have thought proper to refer to the former, which indicates the blue borders of the caudal more distinctly. The two figures are illuminated much alike, viz. with fine vertical blue or black bands, and intermediate spaces on the back of bright gamboge yellow. In a. 31 the yellow colour spreads over the dorsal to near its edge, while in 256 the fin is uniformly dark blue, the scaly sheath at its base being yellow; a. 31 has also a crimson-red head and a streak of carmine round the base of the pectoral. Length of figure 6 inches.

Hab. Canton. Ceylon.

GLYPHISODON RAHTI, Russell (*Rahti-pota*), 86? C. et V. v. p. 456 et ix. p. 507? *Icon.* Reeves, a. 33; Hardw. 142.

The prevailing colour in Mr. Reeves's drawing is pale mountain-green, without any of the yellow of the preceding two species. The cheeks and gill-covers are crimson. The fins are greenish, but darken greatly towards their borders. The species has been determined solely from the drawing, and is doubtful. In the 'Histoire des Poissons,' Bennet's figure of *Chætodon tyrwhitti* is referred to *rahti*, but as it is illuminated in accordance with Reeves's figure a. 31, I have considered it to be a representation of the specimen described in the preceding article.

Hab. Red sea. Indian ocean. Malay archipelago and Chinese sea.

GLYPHISODON SORDIDUS, Forskal (*Chætodon*), p. 62; C. et V. v. p. 468; Rüppell, Atl. p. 34. taf. 8. f. 1. *Calamioia pota*, Russell, 85. *Pomacanthæ sale*, Lacép. iv. p. 519.

Examples of this species, procured in the China seas by Capt. Dawkins, R.N., were presented by him to the museum at Haslar.

Hab. Red sea. Indian ocean. China seas.

We have not seen a specimen to which we could refer Mr. Reeves's drawing 274 (Hardw. 145), and are unable to determine the genus to which it belongs. It has the aspect of *Glyphisodon*, a large eye, narrow preorbital, oblong-oval form, the height of the body being equal to half the distance between the snout and the base of the caudal fin. The rays are D. 13|11 or 12; A. 2|10, &c.; the second anal spine is stouter than usual, the caudal much forked with pointed lobes, and there is a filiform tip to the ventrals. The general tint is dark greenish-blue without bars, the head glossed with crimson, the fins blackish-brown, and a black mark on the base of the pectoral. The drawing, like the rest, was executed at Canton. It measures 5 inches.

GLYPHISODON BANKIERI, Richardson. *Rad.* D. 13|11; A. 2|11; C. 15; P. 17; V. 1|5. (Spec.)

The only example we have seen of this species was sent to Haslar Museum from Hong Kong, by Surgeon R. A. Bankier, R.N. It has the oblong form of a *Pomacentrus*, the height of the body being contained thrice and a half in the total length, caudal included. The teeth stand in a single row and are chisel-shaped, with truncated entire tips. The eye is large; the preorbital and suborbital chain very narrow and not toothed; the vertical limb of the

preoperculum uneven, but not regularly toothed; and the operculum terminating in a flat acute pungent point, with a shallow sinus above it ending in a sharp corner: a longitudinal row of scales between the gill-opening and caudal contains twenty-six. The lateral line terminates at the base of the last dorsal ray, and is continued lower down by a little pore in the disc of each scale. The vertical fins are scaly as usual. The middle soft rays of the dorsal end in a short filiform tip, and there is a corresponding acumination of the anal, but not so well marked. The caudal is slightly forked with acute tips. The species differs from the members of the group headed in the 'Histoire des Poissons' by *azureus*, in the pointed lobes of the caudal. It has lost much of its colour, and shows no traces of the dark eye-like spots which characterize the majority of the group. The caudal, end of the tail and hinder parts of the dorsal and anal retain a tinge of yellow; the rest of the two latter fins appears to have been fringed with black, and the fore-part generally of the fish looks dark. Length $2\frac{3}{4}$ inches.

Hab. Chinese seas. Hong Kong.

HELIASES NOTATUS, Temm. et Schl. F. J. Sieb. p. 66. "*Rad.* D. 13|12 vel 13; A. 2|13, &c.; B. 5." (F. J.)

This species has a spot behind the dorsal like *Glyphisodon sordidus*.

Hab. Japan.

HELIASES RETICULATUS, Richardson. *Rad.* D. 12|15; A. 2|13; C. 15 $\frac{1}{4}$; P. 17; V. 1|5. (Spec.)

The profile of this species, leaving out part of the tail, is nearly orbicular, and the body is greatly compressed. Teeth in one row short, subulate, acute, with very minute ones behind, scarcely perceptible even through a lens. Narrow preorbital scaly, and when examined by a lens, seen to be minutely toothed; as is also the vertical limb of the preoperculum, a few teeth at the corner of this bone being larger. A slight sinus in the operculum. Twenty-five scales in a row between gill-cover and anus, and ten or eleven in a vertical row, the lateral line being traced on the second row from the base of the dorsal. It is at first marked by a single pore on the disc of each scale, and further on by a series of short tubes which terminate at the end of the dorsal. Most of the posterior scales have a little pit on their discs, producing the semblance of several lateral lines. We have seen only two examples of this species, which were brought from China by Sir Edward Belcher. The tips of the soft rays of their vertical fins are a little shortened, but the caudal is sufficiently perfect to show that it was slightly notched at the end. After long maceration in spirits, the ground colour is milk-white, with a well-defined pale yellowish-brown border to each scale, producing a net-work with acutely elliptical meshes. The spinous dorsal and the ventrals are clouded with umber-brown. The other fins retain no colour. Length $2\frac{1}{4}$ inches.

Hab. China seas (Sir E. Belcher).

POMACENTRUS NIGRICANS, Lacépède (*Holocentrus*), iv. p. 332 et 367; C. et V. v. p. 425; *Icon.* Reeves, a. 32; Hardw. 146. Chinese name, *Hih yu*, "Black fish" (Reeves, Birch).

Hab. Sandwich islands and coasts of China.

AMPHIPRION CHRYSARGYRUS, *Icon.* Reeves, a. 26; Hardw. 141. Chinese name, *Hae kin yu*, "Silver gold fish" (Birch); "Sea gold fish" (Reeves).

It has been remarked in the 'Histoire des Poissons,' that the differently coloured Amphiprions may be in many instances mere varieties of one species. As these have however been described and named, it seems necessary that this one, whether species or variety, should also be noted.

The general colour appears nearly uniform, but is composed of black with orange-brown and crimson, the latter colour replacing the others before the nose. The breast, pectorals and ventrals are bright saffron- or king's-yellow; a white band descends from the nape over the fore part of gill-cover and edge of preoperculum, another from the posterior dorsal spines to the anal region, and a third occupies the trunk of the tail between the vertical fins. These three bands have a faint flesh-coloured or roseate tinge, and the first two are edged with verdigris-green. The caudal is cream-yellow without shadings or spots. The lobes of the caudal are obtuse. Length $4\frac{1}{4}$ inches.

AMPHIPRION JAPONICUS, Temm. et Schl. F. J. Sieb. p. 66. *Rad.* B. 5; D. 10|15; A. 2|14; C. 24; P. 19; V. 1|5. (Spec. Haslar Mus.)

The Haslar Museum possesses specimens of this fish, presented to it by Capt. Dawkins, R.N., who brought them from China. In one individual the ventrals are wholly orange-coloured, in another they are edged like the anal with black, as described by the authors of the 'Fauna Japonica.' It is probable that both this fish and the one preceding it will eventually prove to be mere varieties of *chrysopterus*. In *japonicus* the stomach is nearly globular with three conical pyloric cæca, and the eggs are oblong-oval, and not round.

Hab. Seas of China and Japan.

AMPHIPRION CHRYSOPTERUS, C. et V. v. p. 401.

Hab. Japanese sea.

Tribus PHARYNGOGNATHI.

Fam. LABRIDÆ.

LABRUS EÖTHINUS, Richardson. *Icon.* Reeves, 197; Hardw. . Chinese name, *Tze ko*, "Purple parrot" (Birch); *Soo ko* (Reeves); *Su ko* (Bridgem. 219). *Rad.* D. 9|11; A. 3|10; C. 12 $\frac{3}{8}$; P. 12; V. 1|5.

This fish agrees with *L. pæcilopleura* and *gayi* in the number of the rays and in many other characters, but differs from both as much as they do from one another.

Teeth labroid, curved, acute and conical, diminishing as they recede from the symphysis; but a large curved canine tooth stands forwards from the angle of the mouth. A row of small interior teeth runs as far back as the middle of the upper jaw, but in the lower jaw it is confined to the front part. Five rows of small tiled scales cover the cheek up to the suborbital chain. None exist on the disc of the preoperculum, nor on the dilated interoperculum which spreads under the throat. Large irregular scales cover the operculum. Lateral line traced on twenty-six or twenty-seven scales by bushy muciferous canals. Each cluster is formed of obtuse bifurcations thrice repeated, but the forks are less numerous near the bend of the line at the end of the dorsal, and almost disappear in the short space behind it. The very even dorsal and anal fins move in furrows formed by scaly fillets, and there is a filament behind the tip of each dorsal spine. The drawing is coloured aurora-red, passing into hyacinth-red on the back, with a darker meniscoid patch on the edge of each scale, and ten green lines radiating from the eye forwards, across the top of the head and backwards over the nape, but not on the cheek. There is also a yellowish tinge on the snout. The vertical fins are coloured like the body, but the dorsal and base of the caudal are glossed with yellow and green, and the dorsal is marked by three rows of small olive-green spots. The ventrals are peach-blossom red, and the pectorals transparent, with a blue edge to their scaly base. Length of the specimen 9 $\frac{3}{4}$ inches; of the drawing, 7 inches.

Hab. China seas. Canton.

LABRUS RUBIGINOSUS, Temm. et Schl. F. J. *Rad.* D. 9|11; A. 3|10; C. 13 $\frac{5}{8}$; P. 11; V. 1|5. (Spec. Br. Mus. inches long.)

Our knowledge of this species is derived from one of Bürger's Japanese specimens belonging to the British Museum. It has the general form of *L. eöthinus*, but is rather more slender, and is further distinguished from that species by a purple spot at the base of the fifth dorsal spine, some white spots on the back and four brown longitudinal lines. There are twenty-five scales on the lateral line, and the muciferous canals on each are twice forked on the anterior part of the body, and more simple posteriorly, being no where bushy. The number of the 'Fauna Japonica' which is to contain the descriptions of the *Labridæ* is not yet published (March 1, 1846), and we do not therefore know whether the authors of the work in their selection of the specific epithet had reference to the *Sparus rubiginosus* of Solander, which is either a *Labrus* or *Iulis*. This however has a lunate caudal with acute angles, while the Japanese fish has a rounded or nearly square caudal (vide *Iulis? rubiginosus*, Richardson, 'Ann. and Mag. of Nat. Hist.' for June 1843).

Hab. Sea of Japan.

LABRUS RETICULATUS, Temm. et Schl. F. J. pl. 83, 83 A, 84.

Hab. Sea of Japan.

LABRUS JAPONICUS, C. et V. xiii. p. 99; Temm. et Schl. pl. 85.

Hab. Sea of Japan.

COSSYPHUS RETICULATUS, C. et V. xiii. p. 139. *Labrus reticulatus*, Temm. et Schl. F. J. Sieb. pl. 83 (*Jun.*), pl. 83 A. (*Med. ætat.*); pl. 84 (*Adult.*).

The text appertaining to this Plate is not yet published (Sept. 1845).

Hab. Sea of Japan.

COSSYPHUS MICROLEPIDOTUS, Bl. 292 (*Labrus*); C. et V. xiii. p. 140.

Hab. Sea of Japan.

COSSYPHUS BILUNULATUS, Lacépède (*Labrus*), iii. p. 454 et 528; C. et V. xiii. p. 122; *Icon.* Reeves, 243; Hardw. 302. Chinese name, *Hung ying yu*, "Red parrot-fish" (Birch); "Red eagle-fish" (Reeves).

Hyacinth-red glossed with yellow inferiorly, each scale finely dotted on the margin with brownish-red, the head above deep crimson, with arterial blood-red stripes. Cheeks and gill-pieces silvery with purplish tints, a few red specks and a brownish-red stripe from the corner of the mouth over the lower part of the cheek and suboperculum to the gill-opening. Soft parts of vertical fins and caudal yellow with red shadings. Spinous dorsal, pectorals and ventrals lake-red. Black marks on the hinder part of back and top of tail, and first three dorsal spines blackish-blue. Length of figure $9\frac{3}{4}$ inches.

Hab. Mauritius. China seas. Canton.

COSSYPHUS CYANOSTOLUS, Richardson. *Icon.* Reeves, 251; Hardw. 292.

Chinese name, *Tsing e*, "Blue clothes" (Birch); *Ching e*, "Blue coat" (Reeves); *Tsing i* (Bridgem. Chrest. 123). *Rad.* D. 13|7; A. 3|10; C. $12\frac{3}{3}$; P. 18; V. 1|5. (Dried spec. Br. Mus.)

A dried specimen of this fish, brought from Canton by John Reeves, Esq., exists in the British Museum, measuring fourteen inches in length. The drawing is eleven inches long. In the number of the rays and many other characters it agrees with *C. schœnleinii*, but it has not the vertical profile of that species. In the rays, and also in the form and distribution of the markings, it is much like the *Labrus japonicus* as figured in the 'Fauna Japonica,' pl. 85, but has a much less convex and more sloping profile as well as a different ground colour. The latter difference would weigh little as a specific distinction, since the reds, greens and blues of the *Labridæ* are interchangeable at various seasons and after the death of the fish; but there is also a discrepancy in the ramifications of the mucous canals which form the lateral line. They are less branched anteriorly in *L. japonicus*, but in *C. cyanostolus*, as in *schœnleinii*, they become more simple posteriorly.

Height of body contained twice and two-thirds in the whole length. Profile between the upper lip and dorsal a small arc of a circle, slightly gibbous at the eye. A long scaly trunk of the tail, the scales covering much of the caudal fin, which consequently looks short and spreads little. A stout subulato-conical tooth next the symphysis is followed by a shorter one. The jaw behind them swells out into a thickish roll, in which a short conical tooth is implanted immediately behind the front canine; further along the jaw there are some scarcely perceptible granular teeth. In the lower jaw the second tooth is slightly recurved, and there is no toothlet in the bony roll behind the front canine, but some very minute granular teeth exist on the edge of the jaw, and at the angle of the mouth four contiguous teeth rise above the rest; but even these are small and might be easily overlooked in a recent specimen. Lips large. Top of the head, large preorbital, margin of the orbit, lower jaw, most of the interopercular plate, and the disc of the preoperculum minutely porous. Five rows of small, round, distant scales imbedded in the cheek, thinning off to one row on the temples. Upper limb of preoperculum finely serrated by teeth which point upwards, the corner slightly rounded, and the lower limb half as long as the upper one. Interoperculum spreading out into a large submembranaceous flap which comes over the throat. In the specimen there are only four or five scales remaining on this bone, and they are closely tiled at the angle of the preoperculum. Four or five rows of larger scales exist on the operculum. The gill-flap ends in a rounded membranous lobe which projects over the base of the pectoral. Lateral line composed of thirty scales, and marked on each scale by a bush-like cluster of mucous canals, which are equally full of branches from the beginning to the end of the line. Each cluster is bifurcated, spreading equally above and below the line, and each fork consists of about four undulating branches with short lateral branchlets. The basal striæ show faintly through the scale which overlaps them. A patch of scales covers the supra-scapular, as in a sparoid.

The ground colour of the drawing is oil-green, darker on the head and back, and each scale on the body and hinder part of the gill-cover is marked by an oval indigo-blue spot placed vertically, and shaded off for the most part by greenish-blue. There are no spots beneath and before the pectoral, and on the tail behind the anal and dorsal the spots are placed lengthwise, so as to form longitudinal rows, which end in nearly continuous streaks on the caudal. They are broken again into spots on the extremity of the caudal, and some of the streaks are glossed with green. Three blue and green stripes radiate from the eye over the nose, and as many

backwards over the temples. A blue stripe edged with hyacinth-red borders the lips and passes from the angle of the mouth over the lower limb of the preoperculum and suboperculum. The membrane of the dorsal is hyacinth-red, the rays blue; a series of blue and green blotches mark the membrane between the spines at the points of the large scales, which form a furrow for the fin, and there is a series of small blue points along the base of this scaly furrow. The anal is lemon-yellow with an indigo-blue border, and streaks of the same, which meander over the fin and anastomose. The pectorals are purplish with an aurora-red scaly base bordered with blue. The rays of the ventrals are indigo-blue, and the membrane of the caudal crimson and brown.

The description of form is wholly from the dried specimen. Two smaller examples in spirits from China are also deposited in the British Museum. In these there are two acute teeth in the bony swelling behind the front canine, but no visible granular ones. There is however a small canine at the angle of the mouth. In the lower jaw the interior bony roll is flattish near the symphysis, and the posterior two-thirds of its length is occupied by short, conical and rather acute teeth. Two rows of scales cover two-thirds of the interoperculum; there are three or four rows of large opercular scales, and the scaly fillets at the base of the anal and dorsal are very distinct. The specimens are $11\frac{1}{4}$ inches long.

Hab. China seas. Canton.

COSSYPHUS OMMOPTERUS, Richardson. *Icon.* Reeves, 98; Hardw. 295.

Chinese name, *Hwa ying ko*, "Blue parrot" (Birch); "Variegated parrot-fish" (Reeves); *Ta aing ko* (Bridgem. Chrest. 65). *Rad.* B. 5; D. 13|7; A. 3|10; P. 17 vel 18; V. 1|5. (Mounted spec. Br. Mus.)

The British Museum possesses a mounted specimen of this fish, which was brought from Canton by John Reeves, Esq. It is nearly allied by form and colour to *C. cyanostolus*, *schænleinii* and *Labrus japonicus*, all of which agree closely in the numbers of the fin-rays, but it is readily distinguished by an eyed spot in the soft dorsal. Profile much like that of *C. cyanostolus*, with a more gibbous nape, and the eye closer to the frontal line. The small scales on the top of the head terminate between the orbits by a deeply concave line. The snout, nasal region, jaws, throat, fore part of cheek and disc of preoperculum are naked. Five rows of small scales occupy a space in the curve of the preoperculum, equal in breadth to that of the porous skin betwixt them and the eye. Upper limb of the preoperculum finely and equally serrated; under edge roughish, but not distinctly crenated; its corner slightly rounded. Five or six horizontal rows of scales on the gill-cover, which ends in a roundish flap, that is narrowed, as in the preceding species, by a curve cutting into the suboperculum. A strong conical tooth next the symphysis of the upper jaw inclines to the mesial line and rests against its fellow in the other intermaxillary; a small tooth immediately follows it, and in the middle of the gape there is another, but none at the corner of the mouth, and no other teeth, although some faint crenatures may be detected on the edge of the jaw. In the lower jaw the front tooth on each limb is almost horizontal; a smaller one succeeds, as in the upper jaw, but the tooth in the middle of the limb is wanting; there is a single row of minute rounded teeth on the rather acute edge of the jaw, two or three of them next the corner of the mouth, rising above the others. A small bony roll or ridge swells up behind the front teeth of the lower jaw, but the limbs of the jaw are rather thin. About twenty-eight scales enter into a row between the gill-opening and caudal, and the radiating lines appear more distinctly than in *cyanostolus*. The lateral line is formed by a short stem on each scale with short curved branchlets directed upwards and downwards, the branchlets becoming inconspicuous under the last five dorsal rays, and more posteriorly. This answers to the description of the lateral line in *C. schænleinii*, but the specimen has not the low dorsal of that species, nor the vertical forehead. The tips of the membrane overtop the spines of the dorsal.

The ground colour of the drawing is apple-green deepening to blackish-green on the back, and passing into oil-green and wax-yellow towards the belly. The pectorals and most of the caudal have the middle tint of the sides, and the head is mostly oil-green with much lustre. Each scale down to the lower edge of the pectoral has an oval mark on its disc, which anteriorly is ultramarine-blue, and posteriorly verdigris-green. The bases of the caudal rays are also green, and the upper corner of the fin is orpiment-orange, edged with blue, while the lower corner is wholly purple. The anal has a blue stripe at its base, two rows of blue spots on its disc, and a purple edge. The dorsal is yellowish-brown with the tips of membrane behind the spines, and a row of patches along the middle of the fin blue. The edge of the soft part of the fin is orange, and there is a blackish-blue spot, surrounded by a paler ring, on the bases of the first two jointed rays. The rays of the ventrals are blue, and the scaly base of the pectorals is Dutch-orange, finely dotted with brown and edged with blue. The lips are blue; a blue stripe runs back from the angle of the mouth to the preoperculum; and a blue streak surrounds the gill-cover some way from its border. The eye is encircled by a blue

ring; a streak of the same hue runs downwards to the upper lip, and two pass backwards over the temples and upper part of the gill-flap. Length of the specimen $6\frac{1}{4}$ inches. The drawing is an inch and a half longer.

Hab. Sea of China. Canton.

CTENOLABRUS AURIGARIUS, Richardson, *Ichth. of Voy. of Sulphur*, p. 90. pl. 45. f. 1, 2. *Icon.* Reeves, β . 24; *Hardw.* 303. Chinese name, *Kin shaou* (Birch); *Kum shaou*, "Golden ration" (Reeves); *Kam shaou*, (Bridgem. *Chrest.* 67). *Rad.* D. 9|11; A. 3|9; C. $12\frac{2}{3}$; P. 12; V. 1|5. (Spec. Br. Mus.)

The British Museum possesses an example of this species preserved in spirits, which was brought from Canton by John Reeves, Esq.; and there is another in the Chinese collection at Hyde Park.

Hab. China seas. Canton.

CTENOLABRUS RUBELLIO, Richardson, *Ichth. Voy. of Sulphur*, p. 93. pl. 45. *Icon.* Reeves, 90; *Hardw.* 54. Chinese name, *Hung ying ho le*, "Red parrot carp" (Birch); "Red Parrot carp" (Reeves). *Rad.* D. 9|10; A. 3|8; C. $12\frac{2}{3}$; P. 13; V. 1|5.

A mounted specimen of this fish from Canton was presented to the British Museum by John Reeves, Esq. In the structure of the gill-pieces, the numbers of the fin-rays and other characters, this and the preceding species, and also *Ctenolabrus flagellifer*, have much resemblance to *Labrus japonicus* and *Cossyphus schoenleinii*, *cyanostolus* and *ommopterus*. Their distribution into different genera seems to be artificial.

Hab. China seas. Canton.

CHEILIO INERMIS, Forskal (*Labrus*), *Descr. An.* p. 34. *Labrus fusiformis*, Rüppell, *Neue Wirbel.* p. 7. taf. 1. f. 4. *Cheilio forskalii*, C. et V. xiii. p. 349; *Icon.* Reeves, 100; *Hardw.* 304. Chinese name, *Hae lung*, "Sea dragon" (Reeves, Birch); *Hoi lung* (Bridgem. *Chrest.* 103).

The colours and markings of the Chinese fish agree in the main with individuals taken in the Red sea, but as there is some difference, it may be proper to describe Mr. Reeves's drawing. The ground colour is dark duck-green, deepening to blackish-green on the summit of the back, and fading away on the ventral line. The rays of all the fins have the same green colour. Each scale is marked by a clear round white spot, shaded with sky-blue. In the descriptions of the Red sea fish these spots are said to be confined to the lower parts of the sides. A pale red-lilac streak runs from the corner of the mouth to the preoperculum. The suboperculum is edged by a line of the same colour, and several traverse its disc and anastomose with one another. A small China-blue bar, bent *en chevron*, is placed on the tip of the gill-cover. Eye reddish-orange. The membranes of the dorsal and caudal are hyacinth-red, and the lower half of the former is marked by three rows of white spots. The basal half of the anal is white with oblique bars of hyacinth-red, its outer border is reddish-lilac. The pectorals are olive-green and the ventrals blue.

Hab. Sea of China (Canton). Red sea.

JULIS EXORNATUS, Richardson. *Icon.* Reeves, β . 10; *Hardw.* *Rad.* D. 9|12; A. 3|12; C. $12\frac{1}{4}$; vel 1|14; vel 2|13; P. 14; V. 1|5.

Specimens of this fish were sent from Hong Kong by Surgeon R. A. Bankier, R.N.; several exist in the British Museum and Cambridge Philosophical Institution, which were brought from Canton by John Reeves, Esq. and the Rev. George Vachell; and there are also three in the Chinese collection at Hyde Park. Height of body and length of head equal to one another, and to one-fourth of the total length: the thickness contained twice and one-half in the height. Caudal rounded. About twenty-six scales in the lateral line, which is bent suddenly down near the end of the dorsal by a short oblique elbow. Each scale of the line is marked obscurely by three short tubes, diverging from the point of a very short stem. Scales truncated at the base, elliptical at the posterior or free end, with about twenty to twenty-six fine furrows on each end diverging in a fan-like manner from near the centre, a triangular space on each side showing only the parallel lines of structure. Teeth rather bluntnish; a sharp curved canine standing forwards from each side of upper jaw near the angle of the mouth. Jaws with considerable protractility.

In Mr. Reeves's drawing the ground colour of the body is pistachio-green, the breast and belly being paler. About eight or nine irregular bars, formed by the dark borders of the

scales, descend from the back past the middle. The vertical fins are vermilion-red, with four rows of round and oval straw-yellow spots occupying more space than the red, which however forms a border to the dorsal and anal. In the specimens only two rows of these yellow spots remain on the dorsal, the outer half of the fins being red with a very slight mottling; but there is a dark spot on the dorsal, between the fifth and seventh spines, which is not shown in the figure. The corners of the caudal, both in the figure and specimens, are yellow, and in the figure there are various orange-coloured spots and bars on the head shaded with blue. The form of these can be traced on the specimens though the colour is gone. The dorsal spines have filamentous tips, and are shorter than the soft rays. Length of specimens and figure $5\frac{1}{2}$ and 6 inches. The anal spines vary from one to three, there being one or two additional jointed rays when the spines are deficient.

Hab. China seas. Canton. Hong Kong.

JULIS EXORNATUS, var. α ? *Icon.* Reeves, 258; *Hardw.* — Chinese name, *Ying ko yu* (Reeves); "Parrot fish" (Birch); *Ang ko u* (Bridgeman. Chrest. 63).

Notwithstanding that this drawing and the following differ somewhat in form and in the numbers of the spinous rays from the preceding one as well as in colours, I have a strong suspicion that they are all three representations of the same species in different conditions. The yellow corners of the caudal are common to them all. The marks on the head and on the dorsal are also on the same plan, and on comparing the numerous specimens of *exornatus* which we have seen, most of them appear intermediate in their markings between Mr. Reeves's drawings β , 10 and 258.

In 258 the green colour of the body is varied by an elliptical orange-brown spot, placed vertically on each scale. There are three indistinct golden spots under the spinous rays and fore-half of the soft dorsal, and four yellow patches on the middle height of the tail posterior to the anus, which shade off into the green. The bars on the head are orange-brown, instead of ornament-orange. The two basal rows of spots on the dorsal and anal are dull, and of a wax-yellow or olive-green colour, and the ground colour of these with their outer halves and the middle part of the caudal are cochineal-red or dark crimson. The corners of the caudal are bright yellow. The base of the pectoral is red, and there is a bluish shade on the supra-axillary plate of the coracoid bone. Some blue marks exist also on the upper half of the spinous dorsal, most crowded between the fifth and seventh spines, where the dark mark of *exornatus* is placed. Length of figure nearly 7 inches.

Hab. Sea of China.

JULIS EXORNATUS, var. β . *Icon.* Reeves, 86; *Hardw.* 297. Chinese name, *Ying ko le* (Reeves, Birch); "Parrot carp" (Birch); "Parrot carp" (Reeves); *Ang ko li* (Bridgeman. Chrest. 63).

In this figure the head is marked and coloured like the preceding one, but the sides are chequered by square golden spots which alternate with similar spaces of the ground colour. This is green, like the preceding varieties, on the head, along the back, and in the middle over the anus; but in the humeral region and on the tail it passes into indigo-blue. The belly is white, the white passing along above the base of the anal; while in the preceding figures, the ground colour, though paler, goes to the base of the fin. The dorsal is coloured not much unlike that of the preceding, but the orange-brown ground colour fades to hair-brown on the outer half, and the spots at the base of the fin are orange, shaded with pale yellow. The anal is pale green on the basal half, and purple exteriorly, with a darker green stripe where the colours meet. The corners of the caudal are bright yellow, the middle part dark grayish-blue, with indigo-blue spots on the base. The scaly base of the pectoral red, as in the preceding. In some respects this figure resembles the *Julis decussatus* (Benn. Ceylon, pl. 14).

Hab. Sea of China.

JULIS DORSALIS, Quoy et Gaim., *Astrol.* pl. 15. f. 5; C. et V. xiii. p. 448. *Labrus pulcherrimus,* Solander, *Icon.* Park. Bib. Banks, 49. *Sparus hardwickii,* Benn. Ceyl. 12.

Several specimens exist in Sir Edward Belcher's collection.

Hab. Sea of China? Polynesia, Malay archipelago, Indian ocean, and sea of Mauritius.

JULIS TRIMACULATUS, Quoy et Gaim., *Astrol.* pl. 20. f. 2; C. et V. xiii. p. 452.

Several examples of this species exist in Sir Edward Belcher's collection, which agree well

with the figure in the 'Voyage of the Astrolabe,' though it is objected to in the 'Histoire des Poissons' as not being sufficiently gibbous at the nape. The markings on the head are exactly as in the figure, and also the first and last of the three black dorsal spots, but the intermediate one has disappeared in all the specimens. The borders of all the scales are brightly silvery.

Hab. Sea of China? Vanikoro.

JULIS PÆCILOPTERUS, F. J. 86. bis, f. 1. *Icon.* Reeves, 233; Hardw. 299.
Rad. D. 9|13 vel 14; A. 2|14; C. 11 $\frac{3}{5}$; P. 12; V. 1|5. (Spec. Mus. Brit.)

A dried specimen of this fish exists in the British Museum, which was brought from Canton by John Reeves, Esq. The height of the body is somewhat less than the length of the head, and equals one-fourth of the whole length of the fish. The upper jaw has five conico-subulate teeth of the usual form, with small rounded interior ones, and these come forward to the edge of the jaw behind the last subulate tooth in two or three rows, like the minute molars of a sparoid. On the lower jaw there are thirteen exterior teeth on each limb, and the interior granular teeth do not run so far back. Gill-flap tapering, but rounded at the tip. Lateral line composed of twenty-nine scales, slightly arched at its commencement, then continuing horizontal as far as the ninth soft ray of the dorsal, when it is bent down over three scales and continued straight again to the caudal. It is marked on each scale by a gently waved and slightly rising tube, which before the bend of the line is simple and more posteriorly emits one or two branchlets. The ground colour is pistachio-green, darker on the bases of the scales, and fading to asparagus-green on the lower parts of the sides. The nape is brownish-red, and two stripes of that colour traverse the fish, the narrower one keeping along the summit of the back and the broader one along the middle of the side. On this stripe above the pectoral there is a dark blackish-blue spot. There are many rows of small, round reddish-orange spots, nearly as numerous as the scales, and becoming dark orange-brown in the stripes. These spots extend to the caudal, which is deep sulphur-yellow. The head is marked by golden stripes bordered by blue. The dorsal and anal are pale crimson with a greenish tint on the soft rays, and are thickly sprinkled with carmine spots. The pectorals and ventrals are almost colourless, but the scaly base of the former is yellow and purple bounded by a red streak. The lateral stripe is almost black in the dried specimen. Length of specimen 8 $\frac{3}{4}$ inches, of head 2 inches.

Hab. China seas. Canton.

JULIS THERSITES, Richardson. *Icon.* Reeves, 208; Hardw. i. 298, &c.

This species wants the brown longitudinal stripes of the preceding, but has otherwise considerable similarity in its tints of colour and markings. If the humped-back be not an accidental individual deformity, the fish is at once distinguished by it from other species. The ground colour of the head is duck-green, dark on the back, paler on the sides, and mixed with oil-green and yellow; the under surface is pale blue. There is a darker meniscoid spot on each scale, which on the shoulder and pectoral region is orange-red. A large dark blue mark over the pectoral has the spots on the scales almost black. The lines and spots on the head are vermilion with blue edges. The fins are pale Berlin-blue and are covered with tile-red spots, which form transverse bars on the caudal, and the dorsal and anal have a submarginal red stripe. The base of the pectoral is blue with a red streak; its membrane and that of the ventrals are spotless. The back of this fish rises into a bold hump under the spinous dorsal, the lateral line partaking of the curvature. Length of the figure 7 inches.

Hab. China seas. Canton.

JULIS LUNARIS, Lin. (*Labrus*); C. et V. xiii. p. 409. *Labrus lutescens et L. lorius*, Solander, MSS. *Icon.* Parkins. Bib. Banks, 47. *L. gallus*, Forskal. *L. zeylonicus*, Penn. Ind. Zool. p. 56. pl. 16. *Julis hardwickii*, Gray, Illust. Ind. Zool. pl. 9. *Icon.* Reeves, a. 30; Hardw. 300. *Rad.* D. 8|13; A. 2|11; C. 11 $\frac{3}{5}$; P. 14; V. 1|5. (Spec. Mus. Brit.)

Several specimens from Canton exist in the Chinese collection at Hyde Park and in the British Museum, the latter being the donation of John Reeves, Esq.

Hab. China seas. Canton. Java. Polynesia. Siam. Ceylon. Red sea.

JULIS MENISCUS, C. et V. xiii. p. 415.

Hab. Seas of China (Canton). Seychelles (Dussumier).

JULIS VIRIDIS, Bl. 282 (*Labrus*); C. et V. xiii. p. 420.

Hab. Sea of Japan? Mauritius.

GOMPHOSUS CEPEDIANUS, Quoy et Gaim. Freycinet, pl. 55. fig. 2; C. et V. xiv. p. 18. pl. 390.

A specimen, seven inches long, exists in Sir Edward Belcher's collection.

Hab. Sea of China? the Sandwich Isles, Carolines, and Otaheiti.

NOVACULA PENTADACTYLA, "Ankarkrona Mem. de Stockh. An. 1740 (*Blennius*), i. p. 451. pl. 3. f. 2;" C. et V. xiv. p. 67. *Coryphæna pentadactyla*, Bl. 173.

Hab. China seas. Celebes.

XYRICHTHYS PUNICEUS, Richardson. *Icon.* Reeves, 184; Hardw. i. 306.

This drawing represents a fish having a profile more vertical than that of the European *culturatus* and much like that of Rüppell's *bimaculata*, but with a proportionally higher body, a taller first dorsal ray, larger filiform tip to the ventrals, apparently no scales on the cheek, a much less rounded caudal, larger front teeth, and a lateral spot placed nearly, like that of *pavo*, on the seventh or eighth scale of the lateral line and rising above it. As near as one can judge from description alone, its form seems to be like that of *X. cyanifrons* of the 'Histoire des Poissons,' but its colours do not correspond and its black lateral mark distinguishes it.

The colours of the upper and lower part of the sides and the disc of the caudal fin are bright carmine, the middle of the flanks from the pectoral to the hinder part of the anal being pale buff orange, as are also the membranes of the dorsal and anal. The top of the head and back above the lateral line which terminates at the base of the last dorsal ray are lavender-purple; the trunk of the tail, which is bisected by the short second portion of the lateral line, being wholly carmine. Each scale throughout the body has a deeper coloured meniscoid segment on its edge, but of the same tint with its much paler disc. The cheeks are carmine with red-lilac-purple gill-pieces, throat and breast. The profile of the head, from the nape to the dorsal, is edged with a blue and green stripe, and there are six or seven wavy crimson streaks on the temples, and a few faint longitudinal ones on the operculum. Two rows of blue dots run along the summit of the back, and three rows along the belly, beginning at the ventrals and thinning off at the end of the anal. An oval black mark without a pale border is placed on the lateral line at the seventh scale, most of the spots being above the line. The anterior dorsal ray, which is nearly equal in height to the nape and twice as tall as the other rays, is blue, and three blue lines, more or less interrupted, run along the fin, which is shaded on the edge with lake-red. The anal has a blue line along its base, and its rays are blue with red tips. The upper and under edges of the caudal are buff orange, and its posterior rounded edge pale or whitish. Ventrals lemon-yellow with purple rays, and the pectorals purple at the base, shaded at the top into blackish-gray. Length of drawing $7\frac{3}{4}$ inches.

Hab. China seas. Canton.

In the Chinese collection at Hyde Park there are drawings of another species or variety of *Xyrichtys*.

XYRICHTHYS DEA, Temm. et Schl. F. J. Sieb. pl. 87.

Hab. Sea of Japan.

CHEILINUS NEBULOSUS, Richardson. *Rad.* D. 9|10; A. 3|8; C. 16 $\frac{1}{2}$; P. 12; V. 1|5.

This species seems to be nearly allied in form and in being banded vertically to the *Ch. quinquecinctus* of Rüppell, but the caudal is much less notched between the points of the rays, the anal is rounded at the top and not so long, the profile of the forehead more even and sloping, the snout more slender, and the pale and vertical bands differently placed. It agrees with *quinquecinctus* in having two rows of scales on the cheek, and in the bases of the vertical fins being sheathed by large scales like a *Cosyphus*. It differs from *Ch. fasciatus*, Bl. 257, in having a truncated and slightly rounded caudal, as well as in the profile and disposition of the dark bands.

The muzzle is slender, the profile of the face straight and sloping, nearly touching the eye, and the nape very slightly arched. The height of the body is contained three times and a half in the total length, caudal included. Of this length the head forms rather less than one-third. The dorsal is rather less rounded at the tip than the anal, and they are nearly of equal length, neither of them passing the base of the caudal. The rays of the caudal are forked at the tips, and scarcely project beyond the membrane. The ventrals are attached under the axilla of the pectorals, being somewhat further back than in *Ch. quinquecinctus*, as represented by Rüppell. The two anterior teeth of each jaw are so much larger than the others as to appear like canines, and behind the upper ones are three or four bluntish teeth. On the limbs of both jaws the teeth are in a single series, diminishing slightly as they approach

the angle of the mouth. The jaw is not swelled as in *Cossyphus*, but except in that respect and the interrupted lateral line, this fish agrees closely with that genus. The scales are large, there being only about twenty in a longitudinal row behind the gill-opening. The upper part of the lateral line is traced on thirteen scales and the lower one on eight, the parts overlapping each other a little. The tubes of the scales are sparingly furnished with lateral branches which are mostly short and basal. On some scales near the tail they are quite simple.

The prevailing tint of the specimens, which have been for two years in spirits, is a rich purplish brown, with lighter parts forming indistinctly about six bars, the first of which descends from the suboperculum over the breast, the second is behind the pectoral, and the last on the base of the caudal. The dark parts are clouded and spotted, and run over the dorsal and anal. They anastomose irregularly with one another, and are also varied by a narrow pale vertical streak on each scale, the tip of the scale being dark. Similar streaks, inclined various ways, exist on the scales of the operculum and temples, and on the cheek and interoperculum they are contracted into a roundish spot in the centre of each scale. Three pale lines cross each preorbital, and one follows the curve of the orbit on the suborbital, having underneath it a row of pale pores with open mouths. The caudal is pale towards the base, dark and mottled on the posterior, with the extreme tip paler again. The pectoral is pale without markings, and there are dark blotches on the ventrals.

Two specimens, about five inches long, exist in Sir Edward Belcher's collection, in which they were associated with some Chinese fish, but the place of their capture was not noted.

Hab. Sea of China.

EPIBULUS INSIDIATOR, Pallas (*Sparus*), Spicil. p. 41. t. 5. fig. 1; C. et V. xiv. p. 110. pl. 398. *Sparus insidiator*, Bl. Schn. 278.

A specimen exists in Sir Edward Belcher's collection, most probably but not certainly obtained on the coast of China.

Hab. Sea of China? Moluccas, Java, Sumatra and the Mauritius.

SCARUS LIMBATUS, C. et V. xiv. p. 271. *Icon.* Reeves, a. 13; Hardw. 312. Chinese name, *Ching e*, "Blue clothes" (Reeves); *Tsing i* (Bridgem. Chrest. 123). *Scarus ovifrons*, Temm. et Schl. F. J. Sieb. pl. 88? *Rad.* D. 9|10; A. 3|9; C. 11 $\frac{1}{4}$; P. 14; V. 1|5. (Spec. Brit. Mus.)

John Reeves, Esq. presented an example of this specimen from Canton to the British Museum. It differs slightly, in the numbers of its rays, from the specimen of *limbatus* described in the 'Histoire des Poissons,' also from Canton, yet the distribution of the colours is so similar, that I have little hesitation in considering it to be of the same species. I am also of opinion that it is identical with *Sc. ovifrons* of the 'Fauna Japonica.' It has a gibbous snout, though not to the same degree as is exhibited in the figure of the species just named, but such gibbosities vary in many fish with age, and not unfrequently with the degree of fatness of the individual. There is some discrepancy as to colour, and on that account I have quoted the synonym with doubt, which may perhaps be cleared away when the letter-press of this portion of the 'Fauna Japonica' appears, and we learn whether the figure was illuminated from the recent fish or from one whose colours had partially changed. The Chinese name of the fish is the same as that of the *Cossyphus cyanostolus*. The jaws are greenish with a smooth surface, in which the form of the teeth is obscurely seen. The edges of the jaws are crenated, particularly posteriorly, where the edges are also undulated, but there is no canine tooth there. The scales have finely granulated discs, and the lateral line is formed of a series of tubes, each with a bushy tip, which is so obscure as scarcely to be distinguished from the granulations. Twenty-five scales compose the line, the last three lying on the caudal fin. Length of specimen 16 $\frac{1}{2}$ inches, of drawing 14 inches. In the drawing the general colour is blackish-green, slightly glossed with brown on the belly, the edges of the scales being dark chocolate. The dark green surrounds the eye, and glosses the lower part of the cheek and the interoperculum; the rest of the sides of the head, the breast and discs of all the fins are dark hyacinth-red, which in the anal is glossed with auricula-purple. The outer edges of all the fins, the corner of the mouth and the lower lip are indigo-blue. The edges of the lips are carmine.

Hab. Seas of China, Japan, Java, and the Mauritius.

SCARUS PYRROSTETHUS, Richardson. *Icon.* Reeves, 76; Hardw. 309. Chinese name, *Suy nga*, "Grinding teeth" (Reeves); *Tsui nga* (Bridgem. 125). *Rad.* D. 9|10; A. 3|9; C. 11 $\frac{3}{4}$; P. 14; V. 1|5. (Spec. Brit. Mus.)

A specimen in the British Museum is identified by Mr. Reeves as belonging to the species which his drawing represents. The specimen measures 13 $\frac{1}{2}$ inches, the drawing an inch

more. In form and distribution of colours the species closely resembles *Scarus frenatus*, Lacép., *Sc. psittacus* and *Sc. harid*, Rüpp., *Sc. harid*, C. et V. (which is different from that of Rüppell), and *Sc. dussumieri*, and several others described in the 'Histoire des Poissons.' It cannot however be perfectly reconciled with the descriptions of any of them; and unless several characters, which have been relied upon by ichthyologists for distinguishing species, should prove to be mere individual variations, it is a proper species; but I expect when further comparisons have been instituted, that a number of nominal species, and this probably among the number, will be absorbed in the more ancient designations. In the 'Histoire des Poissons,' the name of Rüppell's *Scarus* is changed from *harid* to *ruppellii*, another species or variety being described as the *harid* of Forskal; but the dentition, as described by the latter author, agrees much better with Rüppell's fish than with the *harid* of M. Valenciennes, which wants the canines at the angle of the mouth. *Sc. pyrrosethus* is much like *Sc. pepo* (Benn. Ceyl. 28. Maj. Neild's drawing in Hardw. Coll. Br. Mus. No. 313) in distribution of colours, but that fish has an uniformly arched profile.

Scarus pyrrosethus has the profile of the face moderately concave before the eye, and the acute points of the caudal projecting very little beyond the even or slightly rounded end of the intermediate membrane. The white jaws are moderately convex and bulge less than those of *limbatus*. About ten teeth may be counted on each side of the symphysis of each jaw, and there is no canine at the angle of the mouth. The scales of the cheek approach close to the orbit and permit less of the veined suborbitals to be seen than in *limbatus*. The lateral line is traced on twenty-five scales by a tube on each, which emits a few simple branches upwards and downwards, and has no bushy end. [The *harid* of the 'Histoire des Poissons' is described as having a lateral line formed of a series of unbranched tubes.] The discs of the scales are more finely granulated than in *limbatus*. The first anal spine is very short, and the last soft ray is divided only at the tip, while the last ray of the dorsal is divided to the base.

Each scale on the body and tail, down to the level of the lower edge of the pectoral fin, has an indigo-blue disc with a broad golden-coloured border edged with chestnut-brown. The borders are wider on the back and the blue discs smaller, and the scaly sheath of the base of the dorsal presents alternate, short, golden and blue vertical bars, the blue running into a stripe of the same colour that runs along the bottom of the membrane. The rays of the fin and its outer border are also blue, the membrane being reddish-orange. The anal has a reddish-orange disc without the blue rays, but its outer edge and a line skirting its base are blue. The same blue colour exists on the upper and under edge of the caudal and the first rays of the pectoral and ventrals, but not on any other part of these fins. A part of the pectoral next the blue ray, three soft rays of the ventrals, and the under part of the fish below the level of the pectorals, are reddish-orange. The disc of the caudal and upper parts of the head are yellowish-brown. The eye and lips are orpiment orange, and there is a blue bar behind each lip; another curves up from the angle of the mouth to the orbit to terminate there, and a blue streak passes from the temples over the eye and across the forehead, to meet its fellow on the other side.

Hab. Chinese sea. Canton.

SCARUS CÆRULEO-PUNCTATUS, Rüppell, Neue Wirlb. p. 24. pl. 7. f. 3. (*Calliodon*); C. et V. xiv. p. 262. *Icon.* Reeves, 248; Hardw. i. 311. Chinese name, *Ma e*, "Flax clothes" (Birch); "*Ma* clothed;" *Ma* is a Canton word (Reeves).

Mr. Reeves's drawing shows numerous blue dots on the head, and also four rows of them on the rays of the ventrals and anal, which are not mentioned in the 'Histoire des Poissons,' but which are indicated in Rüppell's figure.

Hab. Sea of China and the Red sea.

CALLIODON CHLOROLEPIS, Richardson, Ichth. of Voy. of Sulph. p. 137. pl. 64. f. 4-7; *Icon.* Reeves, 77; Hardw. i. 310. Chinese name, *Tsuy leen chuy*, "Green-scaled tsuy-fish" (Birch); *Tsuy lin chuey*, "Scaly king-fisher;" *Tsuy* is the name of the king-fisher (Reeves); *Tsui lun chui* (Bridgem. Chrest. 122).

Surgeon R. A. Bankier, of the Royal Navy, presented a specimen of this fish, which he obtained at Hong Kong, to Haslar Museum.

Hab. China seas. Canton (J. Reeves, Esq.). Hong Kong (Surgeon R. A. Bankier, R.N.).

CALLIODON JAPONICUS, Temm. et Schl. F. J. Sieb. pl. 89. (Letter-press not published.)

Hab. Sea of Japan.

Fam. SCOMBERESOCIDÆ.

BELONE CAUDIMACULA, Cuv. Règn. An. ii. p. 285. *Kuddera* A., Russell, 176. *Icon.* Reeves, β. 33; Hardw. Malac. 135. Chinese name, *Ho tsin*, "Stork's bill" (Reeves, Birch); *Hok tsam* (Bridgem. Chrest. 57).

Hab. China. Canton (Reeves). Penang, and a salt-water lake near Calcutta (Hardwicke). River Brunai in Borneo. Port Essington, North Australia.

BELONE CICONIA, Richardson. *Icon.* Reeves, 186; Hardw. Malac. 134.

This drawing does not correspond with Russell's figure of the *Wohla kuddera* 175, nor with the two *Belones* described by Rüppell in the 'Neue Wirbthiere,' nor with figures of any other species that we have met with. The two jaws are equal, or very nearly so, and when measured to the front of the orbit, their length is contained four times and three-quarters in the whole length of the fish. The anal is long, the dorsal moderately so, and commencing over the second quarter of the anal, it seems to approach a little nearer to the caudal than that fin. The caudal is slightly lunate at the end with the lower lobe rather the most prominent. The back is green, the sides silvery with a purplish tint. Scales are distinctly represented in the green upper part of the body, which is separated from the nacre sides by a lateral line, but no inferior lateral line or keel is shown in the figure.

Hab. Chinese seas. Canton.

HEMIRAMPUS INTERMEDIUS, Cantor, Ann. Nat. Hist. ix. p. 30. *Icon.* Reeves, 167; Hardw. Malac. 129, 133. Chinese name, *Cheung tün tsam* (Bridgem. Chrest. 80); "Long-headed borer" (Reeves). *Rad.* B. 9; D. 1|14; A. 1|17; C. 15 $\frac{3}{5}$; P. 11; V. 1|5. (Chin. Spec.)

This species differs at first sight from *H. longirostris* (Cuv. et Russell, 178), and from *H. brevirostris* (Idem et Russ. 177), in the relative size of the lower jaw, being less than that of the one and longer than that of the other. From *H. gamberur* (Rüpp. Neue Wirb. 74; Lacép. v. pl. 7. f. 2), it is distinguished by some differences in the numbers of the rays as well as by the comparative length of the lower jaw. We have received specimens of *intermedius* both from Chusan and Canton, but all of them have lost many of their scales, and also in some degree their proper shape, by maceration in spirits. A section of the body has the form of a thin wedge, broadest near the back, which is rounded by the swelling muscles of the sides, and attenuated towards the acute belly. There is no appearance of there ever having been much projection at the inferior lateral line, so as to render the section quadrangular. This line runs near the edge of the belly from the lower part of the operculum nearly to the caudal fin. It is formed by a simple or in some places a forked tube on each scale. The preorbitar is sub-elliptical, with an undulated disc and a minute central umbo. Its anterior edge describes the quadrant of a circle; its posterior one is much less curved. The dorsal and anal are opposite to each other at their commencement, and the former reaches a little nearer to the caudal, though it has fewer rays than the anal. The lower lobe of the caudal is the longest, as usual. The back is greenish, the sides silvery, and there is a broad lateral stripe more brilliantly silvery than the rest, which dilates between the dorsal and anal. The following measurements furnish the comparative lengths of the several parts. Length from the point of the upper jaw to end of caudal, 5.25 inches. From ditto to gill-opening, 0.91 inch. From ditto to anus, 3.38 inches. Length of upper jaw, 0.2 inch. Length from point of lower jaw to end of caudal, 6.35 inches. From ditto to angle of mouth, 1.38 inch. From ditto to fore-edge of orbit, 1.6 inch. From ditto to gill-opening, 2.18 inches.

Hab. Chinese seas. Canton. Chusan.

EXOCÆTUS VOLANS, Solander, MSS. Bib. Banks. *Icon.* Parkinson, 110. Bib. Banks. *Rad.* D. 12; A. 13; C. 15 $\frac{3}{5}$; P. 15; V. 6. All jointed. Length of specimen 5 $\frac{1}{2}$ inches.

A specimen of this fish was brought from China by Sir Edward Belcher. It is probably the same species with the *evolans* of Bloch (398); but in his figure the ventrals are as near to the end of the snout as to the beginning of the anal, while in the Chinese specimen the distance from the snout to the ventrals, when carried backwards, reaches past the middle of the anal; in other respects there appears to be little difference. The same officer brought several specimens of young flying fish from the Chinese seas, evidently of the same species, but none of them exceeding 2 $\frac{1}{2}$ inches in length. All these have the profile of the face more curved, with a variable degree of gibbosity of the nape. They have also two brown spots on the top of the occiput, formed by a congeries of small specks. All the specimens are so much

injured that I think it better to avoid attempting a minute description, especially as I have not an Atlantic example of *evolans* at hand for comparison.

Hab. Seas of China and Polynesia.

EXOCÆTUS FASCIATUS, Lesueur, Jour. Ac. Nat. Sc. Philad. ii. pl. 4. f. 2.

Length of specimen $2\frac{3}{4}$ inch.

Sir Edward Belcher brought an *Exocætus* from the sea of China which seems to belong to this species, but the specimen having been preserved in salt, the colours have perished and the fins are mutilated in their length. It agrees however with *fasciatus* in the approximation of the large eye to the end of the snout, in which it differs from *Ex. exiliens* of Bloch (397). It has also a similar degree of concavity between the eyes with that exhibited in M. Lesueur's figure (fig. 2. 6); and there is a correspondence also in other parts. The fins look dark.

Hab. Sea of China.

EXOCÆTUS MONOCIRRHUS, Richardson. Rad. D. 13; A. 13; C. $15\frac{2}{4}$;

P. 15; V. 6. Length of spec. $2\frac{1}{4}$ inches.

Several *Exocæti* having barbels have been figured, viz. *Ex. nuthalii* (Lesueur), *furcatus* of Mitchell, and *appendiculatus* of Wood, which have a plurality of these appendages, and *comatus* of Mitchell, which is described as having only a single one, but which agrees with the others that have been named in the backward position of the ventrals resembling *exiliens*.

A species with two very short barbels, inhabiting the seas of Polynesia, has the ventrals placed as in *Ex. mesogaster* of Bloch (399), but in it the pectoral reaches only to the fore part of the anal, and it is distinguished from all other *Exocæti* by the size and height of its dorsal, which is black on the upper half. This fish was taken by Banks and Solander at Otaheite, and is named in the manuscripts of the latter *Ex. brachypterus*. Parkinson's figure of it is numbered 108.

In a small *Exocætus*, which was obtained by Sir Edward Belcher on the coast of China and which we have named *monocirrhus*, the distance from the end of the snout to the ventrals, when carried backwards, does not reach to the middle of the anal; and the pectoral extends a little beyond the base of the caudal. The eye is rather larger than that of *volans*, and is situated at a similar distance from the end of the snout. The barbel, which is black and wrinkled, springs from the end of the chin, and is flat or furrowed on the surface that applies to the membrane between the jaws. It does not equal the head in length, but it may perhaps have lost a small part of its tip. There is no trace of a minute lateral barbel such as is shown in Mr. Wood's figure of *appendiculatus* (Journ. Ac. Sc. Phil. iv. p. 283. pl. 17. f. 2).

Hab. Sea of China.

Fam. BLENNIIDÆ.

BLENNIUS? AURO-SPLENDIDUS, Richardson. Icon. Reeves, 0 (non Hardw.).

It is possible that this species may be a *Pholis*, *Petroscirtes* or *Salarias*, but in the absence of information respecting its dentition and gill-openings, we cannot say to which of the genera established in the 'Histoire des Poissons' it properly belongs. It has much of the aspect of a Blenny, and has a vertical face and crested head like the males of *Blennius pavo*, and of some other species. The body is longer than of the fish just named, and the first seven dorsal rays are elongated, the remainder of the fin being even. The body is wax-yellow, with a brownish bar faintly indicated on the posterior part of the lateral line, and five rows of bright golden specks intermingled with much smaller and more numerous black dots in seven or eight rows. The head and all the fins, except the anal, are bright king's yellow. The crest is dotted with black, and a bar of that hue descends from it through the eye to the corner of the mouth. There is also a round black mark on the middle of the fore-part of the dorsal, comprising the first four rays. The anal is reddish-orange or buff, passing into yellow at its base. Length of the figure nearly 4 inches.

Hab. Macao.

BLENNIUS? FASCIOLATOCEPS, Richardson. Icon. Reeves (nullo numero nec Hardw.).

This figure represents a fish having more nearly the proportions of *Blennius pavo* than the preceding. Its head is also crested, and the dorsal perfectly even without elongated rays. General colour wax-yellow, obscurely mottled, the head marked by five vertical black bands on a brighter yellow ground. The second band passes through the eye, and the fifth descends

from the shoulder over the gill-opening. The fins are dull honey-yellow. Neither this figure nor that of the preceding species show any barbels or cirrhi. Length of figure $2\frac{3}{4}$ inches.

Hab. Macao.

SALARIAS FASCIATUS, Bl. pl. 162. f. 1 (*Blennius*). C. et V. xi. p. 324.

The native place of this fish is unknown, there being some uncertainty as to whether it came from India or Japan. Few particulars respecting its structure are recorded.

PETROSCIRTES BANKIERI, Richardson, Ichth. of Voy. of Sulph. p. 136. pl. 64. f. 8–10. Genus, *Petroscirtes*, Rüppell; *Blennechis*, C. et V.

Surgeon R. A. Bankier presented a specimen which he obtained at Hong Kong to Haslar Hospital.

Hab. Hong Kong.

STICHÆUS HEXAGRAMMUS, Temm. et Schl. F. J. Sieb. p. 136. pl. 73. f. 1. “*Rad.* B. 6; D. 40; A. 29 *simplices*; C. 12; P. 14; V. 3.” (Fauna Jap.) Genus *Stichæus*, Remhardt, Oversigt over det Kongelige, &c. 1835–6. p. 9.

Hab. Japan. Bay of Simabara.

GUNNELLUS NEBULOSUS, Temm. et Schl. F. J. Sieb. pl. 73. f. 2. (Letterpress not yet published.) *Rad.* D. 80; A. 39; C. 21; P. 15; V. 1|1. (Spec. $9\frac{1}{4}$ inch. long in Br. Mus.)

Hab. Japan. Bay of Mogi.

GUNNELLUS CRASSISPINA, Temm. et Schl. F. J. Sieb. p. 139. “*Rad.* D. 78; A. 2|40; V. 1|1.” (Faun. Jap. *l. c.*)

Hab. Japan.

DICTYSOMA, Temm. et Schl. F. J. Sieb. p. 139. pl. 73. f. 3. Spec. $4\frac{1}{2}$ inch. long in Br. Mus. “*Rad.* B. 6; D. 58|9; A. 2|43; C. 10; P. 10.” (Fauna Jap.)

Hab. Japan. Bay of Simabara.

Tribus SCOMBRISINA.

Fam. ZEIDÆ.

ZEUS JAPONICUS, Tilesius, Voy. Krusenst. pl. 61 (*Dorée ou Poisson à miroir du Japon*). C. et V. x. p. 24; Temm. et Schl. F. J. Sieb. p. 123. *Icon. piscium a Pictore Sinense pict.* Bib. Banks. Japan Fishes, Bib. Banks. *Zeus australis*, Richardson, Ichth. of Voy. of Erebus and Terror, p. 36. pl. 25. f. 1.

In the work last quoted I gave a figure of a Dory obtained by Sir James C. Ross at Port Jackson, drawn from a specimen that was in very bad condition. The account of the Japanese Dory, contained in the ‘Fauna Japonica,’ mentions no character that I do not find in the Australian one.

Hab. Seas of Japan, China, and Australia.

ZEUS NEBULOSUS, Temm. et Schl. F. J. Sieb. p. 11. pl. 66.

Hab. Sea of Japan.

SPHYRÆNIDÆ.

SPHYRÆNA OBTUSATA, C. et V. ii. p. 350; Temm. et Schl. F. J. p. 33. pl. 13. f. 2.

Hab. Southern coasts of Australia, Javan sea, sea of Japan, Indian ocean, and the Mauritius.

SPHYRÆNA CHINENSIS, Lacépède, v. p. 334. pl. 10. f. 2; *Icon.* Reeves, 62; Hardw. 86. Chinese name, *Chuk tsên*, “Bamboo stick”; *Choh tsin* (Bridgem. Chrest. 224). *Rad.* B. 7; D. 5|–1|8; A. 2|8; P. 20; V. 1|5. A specimen in the museum of the Cambridge Philosophical Society, brought from China by

the Rev. George Vachell, enables us to give a short account of this species. It differs from *obtusata* in having two points to the gill-cover, and from all the species that have been hitherto figured, in its higher shoulder and more concave profile. The specimen does not exhibit this peculiarity of form so strongly as the figure, but it is flaccid and may have lost its exact shape.

Canine teeth acute, subulate and slightly flexuose, like the italic *s.* Two on each side, widely set on the upper jaw, with small lateral teeth pointing backwards, not arranged by threes but with intervals, as if one had fallen out here and there. A few tall, compressed, lancet-shaped teeth arm the palate-bones, and smaller teeth of the same form stand in a single row on the limbs of the lower jaw, their size augmenting gradually as they near the corner of the mouth; two canines standing contiguously on the tip of the jaw. No teeth on the small chevron of the vomer. The gill-cover shows two small, slender, flat points, the upper one being rather the longest. Lateral line almost straight; torulose.

Hab. Canton.

SPHYRÆNA NIGRIPINNIS, Temm. et Schl. F. J. Sieb. p. 34. pl. 13. f. 1.

Hab. Japanese sea.

SPHYRÆNA (VULGARIS) JAPONICA, C. et V. ii. p. 354; Temm. et Schl. F. J. Sieb. p. 33.

This fish was merely indicated in the 'Histoire des Poissons' from a Japanese drawing, but the authors of the 'Fauna Japonica' possess a single dried specimen, which they state to be in no respect different from the European one. It is distinguished from the Indian *Sphyræna* by the ventrals being further back than the tips of the pectorals.

Hab. Japanese sea. (Mediterranean?)

Fam. SCOMBRISIDÆ.

SCOMBER SCOMBRUS, Lin. Bl. Auct. C. et V. viii. p. 6; Temm. et Schl. F. J. Sieb. p. 92; *Icon.* Reeves, 163. Chinese name, *Ta che*, "Variegated che" (Reeves); *Fa chi* (Bridgem. Chrest. 105).

Hab. Chinese and Japanese seas. Cape of Good Hope. Atlantic. Mediterranean. Black sea (not in the sea of Azof). English channel. North sea and Baltic.

SCOMBER PNEUMATOPHORUS, "Laroche," C. et V. viii. p. 36; Temm. et Schl. F. J. Sieb. p. 93. pl. 47. f. 1 et 2.

Hab. Chinese, Japanese, and Australian seas. Mediterranean and Atlantic coasts of North Africa.

SCOMBER DELPHINALIS, "Commerson," C. et V. viii. p. 53. *Icon.* Reeves, β. 23; Hardw. i. 183. Chinese name, *Hwa tsze* (Birch); *Ta tze*, "Flowered tze" (Reeves); *Fa chi* (Bridgem. Chrest. 106).

Hab. China seas and coasts of Madagascar.

THYNNUS ORIENTALIS, Temm. et Schl. F. J. Sieb. p. 94.

Hab. Sea of Japan.

THYNNUS THUNNINA, C. et V. viii. p. 104. t. 202; Temm. et Schl. F. J. Sieb. p. 95. pl. 48. *Maquereau à quatre points*, Geoffr. Egypt. pl. 24. f. 3. Japan Fishes, Bib. Banks, fig. 35.

Hab. Japanese sea. Mediterranean.

THYNNUS PELAMYS, Lin. (*Scomber*). C. et V. viii. p. 113. Japan Fishes, Bib. Banks, fig. 49. *Icon.* G. Forsteri, 230. in Bib. Banks (Atlantic); Temm. et Schl. F. J. Sieb. p. 96. pl. 49.

Hab. Sea of Japan. Malay Archipelago. Straits of Sunda. Polynesia. South American coasts. Canaries. African coasts.

THYNNUS SIBI, Temm. et Schl. F. J. Sieb. p. 97. pl. 50 (*sibu*).

Hab. Sea of Japan.

THYNNUS MACROPTERUS, Temm. et Schl. F. J. Sieb. p. 98. pl. 51.

Hab. Sea of Japan.

PELAMIS ORIENTALIS, Temm. et Schl. F. J. Sieb. p. 39. pl. 52.

Hab. Sea of Japan.

CYBIUM COMMERSONII, Lacép. ii. p. 600. pl. 20. f. 1? (*Scomber*). C. et V. viii. p. 165?; Rüppell, Atl. p. 94. taf. 25. *Icon.* Reeves, 228; Hardw. i. 184. Chinese name, *Lan teen keaou*, "Green-spotted *keaou*" (Birch); *Lam teen kow*, "Blue-spotted *kow*" (Reeves).

The spinous dorsal is higher than in Lacépède and Russell's figure, and more resembles Rüppell's, supposing that the membrane connecting the filamentous tips were more fully developed than it is shown to be in his figure. The central half of the fin is pure white.

Hab. China seas. Indian ocean. Red sea and the Mauritius.

? CYBIUM MERTENSII, C. et V. viii. p. 179? *Icon.* Règn. An. ed. nova. *Icon.* Reeves, 216; Hardw. 182. Chinese name, *Shen keaou*, "Fleshy *keaou*" (Reeves); "Edible *keaou*" (Birch). (Figure 15 inches long.)

Hab. China seas.

CYBIUM CHINENSE, Lacépède iii. p. 23 (*Scomber*). C. et V. viii. p. 180; Temm. et Schl. F. J. Sieb. p. 100. pl. 53. f. 1. *Icon.* Reeves, a. 52; Hardw. i. 186? Chinese name, *New pe keaou*, "Cow-skin *keaou*" (Birch); *New pe kaou* (Reeves).

Approaches closely to the preceding, but it has more dorsal spines, and wants the spots on the tail.

Hab. Seas of China and Japan.

CYBIUM NIPHONIUM, C. et V. viii. p. 180; Temm. et Schl. F. J. Sieb. p. 101. pl. 53. f. 2.

Hab. Sea of Japan.

CYBIUM GUTTATUM, Bl. Schn. (*Scomber*), p. 23. t. 5; C. et V. viii. p. 173; *Wingeram*, Russell, 134; *Icon.* Reeves, β . 46; Hardw. i. 181. Chinese name, *Keaou yu* (Birch); *Kaou yu* (Reeves); *Kau u* (Bridgem. Chrest. 243).

Hab. China seas. Malaccas and the Indian ocean.

TRICHIURUS ARMATUS, Gray, Zool. Misc. p. 9. *T. savala*, C. et V. viii. p. 251; *Icon.* Reeves, β . 56; Hardw. 189. Chinese name, *Pih tae*, "White girdle" (Birch); "White tape" (Reeves); *Pak tai* (Bridgem. Chrest. 241).

A Chinese specimen of this fish exists in the British Museum.

Hab. China sea. Indian ocean.

TRICHIURUS LEPTURUS, JAPONICUS, Temm. et Schl. F. J. Sieb. p. 102. pl. 54. *Tr. muticus*, Gray, Zool. Misc. p. 10?

Hab. Sea of Japan. (Atlantic?)

TRICHIURUS INTERMEDIUS, Gray, Zool. Misc. p. 10. *Rad.* D. 128 vel 130; P. 12. (Spec. Haslar Mus.)

I have had an opportunity of examining several specimens of this fish, viz. two brought from the neighbourhood of Canton by Captain Dawkins and Sir Edward Belcher, and one from the mouth of the Yan tze kiang by Sir Everard Home, besides some injured ones, all of this species. They agree in the height of the body, which is greatest some way behind the anus or nearly in the middle, being equal to one-fourteenth of the whole length; the head*

* Measured between the tip of the snout and end of gill-flap. As the lower jaw projects the relative height of the head would be greater if the measurement were made from thence.

being equal to one-ninth, and the finless tip of the tail to a tenth. The lateral line runs about two-fifths of the height from the edge of the belly, and three from the summit of the back. The distance between the tip of the snout and fore-edge of the orbit is one-third of the length of the head. There are upwards of fifteen very faint streaks on the preorbital. The margin of the upper jaw is curved at the junction of the intermaxillary and maxillary, and the former bone carries ten small teeth, exclusive of the canine one, while the latter is armed by only seven, which are somewhat larger. The maxillary can retire wholly under the preorbital, and scarcely reaches the orbit. The canine teeth have a thin posterior edge at the tip, which ends abruptly, producing a barb which is too minute to be seen by the naked eye, and not to be compared with the acute arrow-headed tooth of *Tr. lepturus*, as represented in Bl. Schn. t. 100. The small teeth are enlarged by similar edges at the base, the tips being narrower and roundish. Top of the head flatish without an acute ridge. The spines on the under edge of the tail are so minute that they cannot be reckoned even by aid of a lens in a plump perfect specimen. In one a little decayed, they are seen to be the clear pungent tips of the inter-spinous bones, with which they agree in number, amounting to about 110 or more. There are two spinous points on the hinder edge of the very small anus. Length, 14-15 inches. From snout to anus, 4.09. Length of head 1.55, of point of tail beyond the dorsal fin 1.40. Height of body 1 inch.

Hab. Sea of China.

NAUCRATES INDICUS, C. et V. viii. p. 326.

Specimens of this fish were brought from the China seas by Captain Dawkins, and presented by him to the Haslar Museum.

Hab. China seas. Amboyna. Indian ocean.

ELECATE BIVITTATA, C. et V. viii. p. 338; Temm. et Schl. F. J. Sieb. p. 104. pl. 56; *Icon.* Reeves, 172; Hardw. 192.

Mr. Reeves's figure shows the bands as described in the 'Histoire des Poissons,' but not the white corners of the caudal. Neither the one nor the other are expressed in the plate of the 'Fauna Japonica.'

Hab. Seas of China and Japan, and the Moluccas.

CHORINEMUS ORIENTALIS, Temm. et Schl. F. J. Sieb. p. 106. pl. 57. f. 1.

Hab. Sea of Japan.

CHORINEMUS LEUCOPHTHALMUS, Richardson. *Icon.* Reeves, 219; Hardw. 195. Chinese name, *Yin pié keaou*, "Silver-white keaou" (Birch); *Yen pak keaou*, "White-eyed mackerel" (Reeves).

I have been unable to refer this figure to any described species. It has nearly the proportions and general form of *Ch. commersonianus*, but it wants the spots, and has a more obtuse snout and larger ventrals. The profile is incurved over the eye which renders the snout gibbous. The eye is large. The lateral line makes a small arch at its commencement and is then waved twice slightly up and down under the spinous dorsal, the remainder being quite straight from the third or fourth soft ray to the caudal. The scales appear to be very minute, deeply imbedded in the satiny skin and not close to each other. Most of the fish is brightly silvery, but the back is deep lavender-purple, which fades away before it reaches the lateral line. The snout and temples are shaded with the same, and there is a large blackish-purple patch on the upper and posterior parts of the operculum. The supra-scapular region is brightly silvery, as is also the iris, which has a yellow ring round it. The pectorals are cream-yellow, shaded at the base with brown. The teeth are shown small, setaceous, and thickly set on both jaws. Length of figure 16 inches.

Hab. Sea of China. Canton.

CHORINEMUS DELICATULUS, Richardson. *Icon.* Reeves, i. 92; Hardw. 220. Chinese name, *Wang seang*, "Royal omen" (Birch).

This figure has much the general form of Bloch's *aculeatus*, but differs in the mouth being cleft beyond the middle of the head, and consequently passing the eye considerably. Its snout is also more gibbous at the nostrils. It may possibly be the young of some of the spotted species. In the size of its mouth it appears to coincide with *exoletus*, but the lateral line wants the undulations which are noticed in the description which is given of that fish in the 'Histoire des Poissons.' The cleft of its mouth is larger than that of *leucophthalmus*. The lateral line makes an angle over the pectoral and afterwards continues straight without any undulation whatever. In the figure the back is illuminated by a clouded mixture of delicate sienna-yellow, having metallic lustre and pale siskin-green, the parts below the lateral line

being brightly silvery. A stripe of umber-brown runs along the side of the head over the eye, the temporal groove is shaded by the same, and there are a few diverging brown streaks on the upper edge of the operculum and humeral bones. The pectoral and caudal are ochraceous, the dorsal and anal faint mountain-green, and the ventrals pink. Length of the figure 6 inches.

Hab. Chinese sea.

TRACHINOTUS AURATUS, Richardson. *Icon.* Reeves, 104; Hardw. 196.

Chinese name, *Hwang lä tsang*, "Yellow wax tsang" (Birch); *Wong la tsong*, "Yellow wax" (Reeves); *Wong lap tsong* (Bridgem. Chrest. 150).

Rad. D. 6|1|20; A. 2|1|17; C. 17 $\frac{6}{8}$. (Spec. Br. Mus.)

This species makes the nearest approach to *Tr. mokalee*, but its snout is not so high, and its colour differs. The British Museum possesses a specimen from Macao which measures 9 inches in length; but it attains a greater size, as Mr. Reeves's figure measures 14 inches. The height is equal to twice the length, including the central caudal rays. The snout is not vertical as in *mokalee*, but is very convex, the profile running nearly straight, or scarcely arched, from the nostrils to the dorsal with a slope of about forty degrees. The points of the dorsal and anal are a little less acute and falcate than in *mokalee*. The caudal is deeply forked, the length of its lobes being equal to half the height of the body. First jointed rays of dorsal and anal compressed but strong, lateral line undulated. The colour is a bright saffron-yellow, with much lustre, which gives place on the breast and along the belly and base of the anal to a pure silvery colour. The head is also yellow, with silvery lower jaw and edges of the gill-pieces: a blue tint spreads round the nostrils. The dorsal and pectorals are dark hair-brown, the former with a pale edge. The ventrals are bluish white, and are smaller than the pectorals; the anal is tinged with orange, and the caudal, mostly coloured like the dorsal, is edged in the depth of the fork with yellow.

Hab. China seas. Canton.

In the Chinese collection at Hyde Park, there are two specimens of a *Trachinotus* of another species, but having the same number of dorsal spines with the preceding. I examined them only in a very cursory manner.

TRACHINOTUS ANOMALUS, Temm. et Schl. F. J. Sieb. p. 107. pl. 57. f. 2.

"*Rad.* D. 4|2|30; A. 2|1|29; C. 20; P. 20; V. 1|5." (F. Jap. from figure.)

Hab. Sea of Japan.

TRACHINOTUS MELO, Richardson. *Icon.* Reeves, 97; Hardw. 218.

Chinese name, *Kwa tsze tsang*, "Melon tsang" (Birch); "Melon seed tsong" (Reeves); *Kwa tsz tsong* (Bridgem. Chrest. 152). *Rad.* D. 7|19; A. 3|17;

C. 16 $\frac{1}{10}$; P. 18; V. 1|5. (Spec. Camb. Ph. Inst.)

The *Tr. anomalus* of the 'Fauna Japonica' is described solely from the figure which was executed in Japan. It may therefore prove, when better known, to be the same species with the Chinese one represented in Mr. Reeves's drawing. Of this an example exists in the Museum of the Cambridge Philosophical Institution, which was brought from Canton by the Rev. George Vachell. It has the same elliptical profile with *anomalus*, but its snout is more obtuse and sufficiently gibbous at the nostrils to project a little beyond the mouth. Mouth small. Nostrils two round contiguous openings before the eye. Eye large. Anus between the tips of the ventrals immediately before the anal fin, no free spines intervening. Head nacy, without scales. Scales of the body very minute and tender, but not deciduous. Lateral line nearly straight, without any semblance of a keel or armature posteriorly. There are no scales on the vertical fins. The spines of the dorsal have been omitted by the artist, and they may be very readily overlooked when recumbent: they are seven in number, exclusive of the recumbent ones. The first is very short, and the sixth is shorter than the fifth, so that the spinous part has a very slightly arched shape, and is almost as distinct from the soft part as in some *Scianidæ*, which are described as having two dorsals. The sixth spine equals the fifth one in length, and belongs more properly to the soft fin, which is not in any way pointed or falcate. The second anal spine is as long as the third one, and is stronger and somewhat curved. Pectorals moderate size. Ventral spines short: these ventrals, from the thinness of the belly, are contiguous. The fish generally is brilliantly nacy or silvery, with a bluish-gray tint along the back and at the bases of the opercular pieces. There is a wood-brown tint on the nape, and a gloss of the same on the sides. The fins are transparent, and the dorsal is traversed by a faint stripe below its middle; and another faint brownish stripe a little arched runs from the temples to the trunk of the tail. The muscles shine through the integuments of the sides, producing stripes bent *en chevron*, first at the brown stripe and then in the oppo-

site direction at the lateral line. Length of the specimen, 2.15 inches. Height of its body, 0.85 inch. Length of figure, 6 inches.

Hab. China seas. Macao.

Another *Trachinotus*, resembling the preceding, but apparently not the same, exists in the Chinese collection at Hyde Park. Its numbers are—*Rays*, D. 8|16; A. 3|16; V. 1|5, &c. The first dorsal spine is very small, the second one is the highest, and is large and greatly compressed. The first anal spine also is very short, the second one strong, and the third one as tall as the second, but slender, delicate, and looking like a soft ray. The examination of this specimen was too hurried to enable me to record other particulars.

Hab. China seas. Macao.

BLEPHARIS FASCIATUS, Rüppell, *Atl.* p. 129. pl. 32. f. 2; *Icon.* Reeves, 269; *Hardw.* 214. Chinese name, *Pih seu kung* "White-haired sir" (Birch); *Pak seu kung* (Reeves); *Pak su kung* (Bridgem. *Chrest.* 36). Same name as the *Scyris indica*. *Rad.* D. 8|23; A. 2|-1|19; C. 16 $\frac{1}{10}$; P. 1|16; V. 1|5. (*Spec. Camb. Ph. Inst.*)

A specimen brought from Canton by the Rev. George Vachell exists in the Museum of the Cambridge Philosophical Institution. Its rays differ a little from the numbers given by Rüppell, but the profile so closely corresponds that I have little hesitation in considering it to be his species. The dorsal spines are arched, the third one being tallest, and the first, seventh and eighth very short. Scales small and deeply imbedded. Lateral line completing its curve under the fourteenth or fifteenth soft dorsal rays, keeled in the tail and armed with minute closely-incumbent shields, which gradually pass into a torulose line as they approach the curve.

Hab. China and Red seas.

BLEPHARIS INDICUS, C. et V. ix. p. 154; Temm. et Schl. p. 113. pl. 60. f. 2.

This is a shorter and higher fish than the preceding, and has not so convex a cranium. In the text of the 'Fauna Japonica' six dorsal spines are mentioned, but the figure shows eight, and one at the base of the soft ray.

Hab. Sea of Japan. The Moluccas.

GALLICHTHYS MAJOR, C. et V. ix. p. 168. pl. 254; Russell, 57; *Icon.* Reeves, 189; *Hardw.* 211. Chinese name, *Chang e mong*, "Long-finned mong" (Reeves); *Cheung yik mong* (Bridgem. *Chrest.* 35). *Rad.* D. 6|-1|19; A. 1|16; P. 18; V. 1|5. (*Spec. Camb. Ph. Inst.*)

A specimen obtained by the Rev. George Vachell at Macao was presented by him to the Cambridge Philosophical Institution. It agrees with the plate in the 'Histoire des Poissons,' except in the profile, from the nostrils to the mouth being rather more oblique, as represented in Bloch's plate, 192. f. 1. The teeth are minute in several rows below, in one or two above. The scales of the body are invisible to the naked eye, but may be detected by a common eyeglass. The lateral line is composed of tubes, giving it a torulose appearance; and on the slender part of the tail the little eminences become wider, making approach to obtuse shields. The usual recumbent spine exists before the dorsal, and it is preceded by three interspinous bones whose thin nail-like heads show through the integument. There are also two interspinous bones protruding before the anal. The anterior filamentous branches of the first four dorsal and anal rays are black, and the anal also is black. Mr. Reeves's drawing is very silvery, with a faint diffused blush of red-lilac-purple, and four vertical bands of that colour a little darker, but still very pale. There are crimson blotches on the base of the pectorals, the inner edge of the ventrals, and under part of the anal and dorsal. Length of figure 6 inches.

Hab. China seas. Moluccas and Indian ocean.

SERIOLA PURPURASCENS, Temm. et Schl. F. J. Sieb. p. 113. pl. 61. "*Rad.* D. 7|-1|30; A. 2|-1|20; C. 25; P. 20; V. 1|5." (F. J.)

Hab. Sea of Japan.

SERIOLA AURO-VITTATA, Temm. et Schl. F. J. Sieb. p. 115 (pl. 62. f. 1. not yet published); *Icon.* Reeves, 230; *Hardw.* 210. Chinese name, *Kin peen che*, "Gold-edged pool" (Birch); *Kum peen che*, "Golden-bordered" (Reeves). *Rad.* D. 7|-1|32; A. 2|-1|20; C. 17 $\frac{6}{8}$; P. 18; V. 1|5. (Chinese spec. Br. Mus.)

Besides the principal yellow band, Mr. Reeves's figure shows another, which runs from the

eye over the supra-scapulars. The ventrals are blotched with purple and green, and there are differences in the tints of less moment. It is a shorter fish than *purpurascens*.

Hab. Seas of China and Japan. Canton.

SERIOLA QUINQUERADIATA, Temm. et Schl. F. J. Sieb. p. 115. pl. 62. f. 2.

“*Rad.* D. 5|–1|32; A. 2|–1|19; C. 22; P. 22; V. 1|5.” (F. J.)
6|–1|31; 2|–1|20; P. 20, &c. (Spec. Br. Mus.)

It is probable that this is a mere variety of *auro-vittata*. In a specimen in the British Museum which was brought from China by Mr. Reeves, we found six spines in the first dorsal. This individual presented no other difference in form from *auro-vittata*, except that the teeth were a little shorter and more closely villiform. It measured ten inches, and the specimen of *auro-vittata*, with which it was carefully compared, exceeded it by only one inch.

Hab. Seas of China and Japan.

SERIOLA INTERMEDIA, Temm. et Schl. F. J. Sieb. p. 116. “*Rad.* D. 7|–1|32; A. 1|–1|15; C. 16½; P. 21; V. 1|5.” (F. J.)

Hab. Sea of Japan.

LACTARIUS DELICATULUS, Bl. Schn. p. 31 (*Scomber lactarius*). C. et V. ix. p. 238; Chundawah, Russell, 108; *Icon.* Reeves, 170; Hardw. Acanth. 38; (Scales very deciduous) Reeves.

Hab. China sea and Indian ocean.

NOMEUS MAURITII, Cuv. Règn. An. 1^{re} ed. ii. p. 315; C. et V. ix. p. 243. pl. 262 (*Seriola argyromelas*).

In Sir Edward Belcher's collection several specimens of this fish were marked as having been taken in the China seas. They have not the marks of *N. peronii*, but correspond well with the figure of *mauritii* in the ‘Histoire des Poissons.’

Hab. Brazils. Coast of Guinea and sea of China.

EMMELICHTHYS SCHLEGELII, Richardson. *Erythrichthys*, Temm. et Schl. F. J. Sieb. p. 117. “pl. 63. f. 1.”

Hab. Sea of Japan.

The ninth decade of the Ichthyological part of the ‘Fauna Japonica’ has just reached me as this sheet is passing through the press, and I perceive by the figure of *Erythrichthys* in the 63rd plate, that the genus is identical with the Australian one which I published in the ‘Ichthyology of the Voyage of the Erebus and Terror,’ on the 1st of March 1845. I do not know the date of the letter-press of the ‘Fauna Japonica’ describing *Erythrichthys*. The Australian species differs in the form of its preorbitar and in the dorsal spines. The genus seems to me to be more allied to the Sparoid or Mænoid families than to the Scomberoid, from which it differs in its ptenoid scales.

SCOMBROPS, Temm. et Schl. F. J. Sieb. p. 118. “pl. 63. f. 2.”

Hab. Sea of Japan.

CORYPHÆNA JAPONICA, Temm. et Schl. F. J. Sieb. p. 120. pl. 64.

Hab. Sea of Japan.

STROMATEUS ARGENTEUS, Bloch, 421; C. et V. ix. p. 393; *Icon.* Reeves, β. 32; Hardw. 227. Chinese name, *Tsang yu* (Reeves, Birch); *Tsong u* (Bridgem. Chrest. 148). This is one of the most common fish brought to table during its season in China (Reeves). *Rad.* D. ?|44; A. 46; C. 15½; P. 24. (Dried spec. Br. Mus.)

Mr. Reeves presented a specimen to the British Museum. No spines protrude through the skin in front of the dorsal, but six or seven interspinous bones show through the thick integument. Two or three rays of the anal also are deeply concealed in the front of the fin. This specimen, compared with Russell's figure of *candidus* (pl. 42), was found to differ in the position of the anus relative to the anal fin, and to want the streaks in the supra-scapular region, there being only a few on the nape. The operculum itself is marked by striæ diverging from its upper anterior corner. The profile is a little gibbous behind the eye, and as evenly curved as in *candidus*. The specimen measured 11½ inches in length, and the figure 14½; the body being 7½ high in the latter.

Hab. China seas. Canton. Indian ocean.

STROMATEUS NIGER, Bloch, 160 (*Str. paru*). C. et V. ix. p. 385. *Nalla sanda-*

wah, Russell, 43; *Icon*. Reeves, 194; Hardw. 225. Chinese name, *Hih tsang* (Birch); *Hak tsong*, "Black tsang" (Reeves, Bridgem., Chrest.149). *Rad.* D. 4|42; A. 1|36; P. 21. &c. (Spec. Br. Mus.)

The British Museum possesses a Chinese specimen. One spine can be observed incumbent on the front of the dorsal, but the other three are concealed. The specimen measures 14½ inches, the figure nearly 11. There is a greater distance between the anus and anal fin in this species than in the preceding one. The lateral line is decidedly keeled, and the fins are less pointed than they are represented to be in Bloch's fig. 160, and much less than in his plate 422. The colour is yellowish-gray with lilac and purple tints by no means dark, so that the name of *niger* is not appropriate.

Hab. China sea and Indian ocean.

STROMATEUS SECURIFER, C. et V. ix. p. 344. pl. 373; Cantor, Ann. Nat. Hist. ix. p. 45.

Hab. China sea and Indian ocean. Chusan (Cantor).

STROMATEUS PUNCTATISSIMUS, Temm. et Schl. F. J. Sieb. p. 121. pl. 65.

More pointed and longer anal than *argenteus* has.

Hab. Sea of Japan.

STROMATEUS ATOUS, Russell, 42, (*Atoou koia*). C. et V. ix. p. 389. "*Stromateus sinensis*, Euphrasen in N. Schwed. Abh. ix. p. 49. t. 9;" Bl. Schn. 492.

Hab. Sea of China.

STROMATEUS ACULEATUS, Bl. Schn. p. 492; C. et V. ix. p. 394. "*S. argenteus*, Euphrasen N. Schwed. Abh. ix. p. 49. t. 9." (Mem. de Stockh.)

Hab. China seas.

SESERINUS VACHELLII, Richardson. *Rad.* D. 5|42; A. 3|37; C. 17 $\frac{10}{10}$; P. 21; V. 1|5. (Spec. Camb. Ph. Inst.)

This fish has the same close resemblance to *Stromateus niger* that *Seserinus microchirus* has to *Stromateus fiatola*. The Prince of Canino has replaced the Mediterranean *Seserinus* in the genus *Stromateus*, but the discovery of the Chinese species with larger ventrals and a keeled lateral line justifies Cuvier's separation of the two forms. The Rev. George Vachell brought two specimens from Canton of the *Seserinus* which we have named in honour of him. It is a greatly compressed fish, which is thickest at the orbits, the height of its body being only a quarter less than the length, caudal excluded. The acute nuchal ridge vanishes in the inter-orbital space, which is however not flat. A recumbent spine is placed in front of the dorsal, and five erect ones are so buried in front of the fin that they can be detected only by dissection. The fifth spine has a long, flexible, but not jointed tip, which is also concealed; the others are pungent. The first anal spine is short, the third one a quarter of the length of the soft rays, and the second one of intermediate length. Both the dorsal and anal are falcate. The pectorals are long and falcate, their tips reaching over two-thirds of the anal. Ventrals small, falcate or pointed, attached beneath the corner of the preoperculum, and having the anus between their tips. Tail slender, caudal deeply forked. Scales small, the lateral line torulose or keeled on the tail by soft triangular plates, which have an acute point that catches the finger when drawn back. These plates are small, and when examined with a lens appear to be formed of two divergent tubes, with the acute point rising from the disc they enclose.

Eye distant from the profile. Preoperculum and operculum striated. Lower jaw when depressed longer than the upper one. Teeth as fine as hairs, slightly curved in one close row on both jaws. Colour gone.

Length 3.75 inches. Height of body between dorsal and anal, 2 inches. Length of head, 1 inch.

Hab. China seas. Canton.

CARANX TRACHURUS, Lin. Bl. (*Scomber*). C. et V. ix. p. 11; Temm. et Schl. F. J. Sieb. p. 109. pl. 59. f. 1. With 70 to 75 shields on lateral line.

Hab. Chinese and Japanese seas. Amboyna. New Zealand. Australian seas. Cape of Good Hope. English Channel.

CARANX ROTLERI, Bloch, t. 346 (*Scomber*). C. et V. ix. p. 29; *Icon*. Reeves, 1845.

206; Hardw. 203. Chinese name, *Peen hea* (Birch); *Peen kap che*, "Flat-scaled mackerel" (Reeves); *Pin kap chi* (Bridgem. Chrest. 109).

Hab. China sea. Malaccas and Red sea.

Obs. Only one species of *Caranx*, with several separate finlets succeeding to the dorsal and anal, is distinguished in the 'Histoire des Poissons.' The *woragoo* of Russel (143), which is therein referred to that species, has a more flatly curved lateral line; and there is a second figure 75 in Mr. Reeves's portfolio with another Chinese name which presents some differences, though slight, from *rotleri*. There are fewer detached finlets, the pectoral fin is shorter, does not quite reach to the anal, and is contained above four times in the total length of the fish; and the black spot on the gill-plate, instead of being high up on the operculum, is on the middle of its edge, as in the *woragoo*. The numbers of shields on the lateral line and of the rays of the fins are nearly the same as in *rotleri*, but the curved commencement of the line has been omitted by the artist. Teeth close shorn, villiform, with a taller outer row. *Rad.* D. 7[-1|12 et vii.; A. 2[-1|10 et vi.; P. 25; &c. *Squamæ carinata*, 53. This is not so strongly marked a variety as some that we observe among the *Trachuri*. Its Chinese name is *Chih kea tze*, "Red-mailed tender fish" (Birch).

Hab. Sea of China and the Indian ocean.

CARANX MUROADSI, Temm. et Schl. F. J. Sieb. p. 108. pl. 58. f. 1; *Icon.* Reeves, β 36. Chinese name, *Tsze yu*, "Affectionate fish" (Reeves, Birch); *Chi u* (Bridgem. Chrest. 111).

The first dorsal and the anal spines are omitted in Mr. Reeves's figure, probably because they were depressed in the specimen placed before the artist. The bronze stripe, which is represented narrow and defined in the 'Fauna Japonica,' is diffused over much of the side in the Chinese figure.

Hab. Coasts of China and Japan.

CARANX MARUADSI, Temm. et Schl. F. J. Sieb. p. 109. pl. 58. f. 2.

Hab. Sea of Japan.

CARANX CANCROIDES, Richardson. *Icon.* Reeves, β . 30. Chinese name, *Hwa tsze*, "The crab mackerel" (Reeves); *Hea che* (Birch); *Ha chi* (Bridgem. Chrest. 108). *Rad.* D. 7[-1|22; A. 1|19, &c. *Squamæ carinata*, 40. (Spec. C. Ph. Inst.)

A specimen of this *Caranx* was brought from Canton by the Rev. George Vachell, and presented by him to the Cambridge Philosophical Institution. It belongs to the group of *luna* (Histoire des Poissons, ix. p. 80), which have the teeth in a single row. They are scarcely perceptible, except through the aid of a lens. The species differs from *C. platessa* and *georgianus* and others of the group in the numbers of its rays and extent of armature of the lateral line. The form is elliptical, the height of body being to the length, caudal included, as one to three. The profile from the mouth to the dorsal is sloping with a moderate convexity, and corresponds in its obliquity and curvature with the under profile from ventrals to tip of lower jaw. Pectorals as long as the head, and equal to one-fourth of the length of the fish. Lateral line straight and cuirassed forward to the beginning of the anal, the shields embracing nearly the whole height of the tail behind that fin. No spots are shown on the operculum or elsewhere. The back is coloured olive-green, and the sides and belly brightly silvery, with a tinge of lake on the breast. The fins are transparent, without any darkening on their edges, and have a uniform pale greenish hue. Length of the drawing $4\frac{1}{2}$ inches.

Hab. China seas. Canton.

CARANX CESTUS, Richardson. *Icon.* Reeves, α . 39; Hardw. 206. Chinese name, *Tae yu*, "Girdle-fish" (Birch); *Te yu* (Reeves).

This drawing is remarkable among the other representations of the Chinese Scomberoids in Mr. Reeves's portfolio for the size and definite form of the scales. The shields on the keel are strong and pointed, and run forward and beneath the beginning of the second dorsal. The lateral line appears to be but slightly arched over the pectoral. In form the fish is regularly elliptical, the ventral and dorsal curves equal, and not more convex in the anterior than in the posterior half of the ellipse. Height one-third of the length, including the central caudal rays. Head forming a fourth of the same length. Snout rather acute. Eye somewhat large. Teeth apparently in a single row, small and slender. Pectorals falcate, reaching over the anterior quarter of the anal. This fin and the dorsal are acute and higher anteriorly, but not so much so as to be falcate. The spinous dorsal one quarter lower than the fore-part of the second fin. Three anal spines are shown as incumbent on the first soft ray of the anal, but no free

spines, though from the large space which intervenes between the anus and anal it is probable that such exist. Colour of the back olive-green, with a diffused yellow tinge over the lateral line and temples. There is a very slight tint of lake along the under side of the lateral line, and the under parts are pearly and silvery. Pectorals and ventrals pure sulphur-yellow, the former having a carmine streak across the base, edged with bluish-gray. There is also a reddish stripe along the bases of the dorsal and anal, and the tips are red. A small black spot exists on the edge of the gill-cover, and the membrane connecting the last ten dorsal rays is tipped with black.

Hab. China sea. Canton.

Carangi.

CARANX FORSTERI, C. et V. ix. p. 107. *Yarradanree para*, Russell, 147? *Scomber hippos*, Forster, Hist. Anim. p. 199; *Icon.* G. Forster in Bib. Banks, No. 221; Reeves, 214; Hardw. 207; Chinese name, *Fang che*, "Square mackerel" (Reeves); *Fong chi* (Bridgem. Chrest. 107).

Hab. Mauritius, Indian ocean, China seas, Malay archipelago, New Zealand and Australian seas.

CARANX MALABARICUS, Bl. Schn. p. 31 (*Scomber*). C. et V. ix. p. 121. *Tallam parah*, Russell, 150; *Icon.* Reeves, β . 21; Hardw. 208. *Hwa tsang* (Birch); *Fa tsong*, "Flowered or variegated mackerel" (Reeves); *Fa tsong* (Bridgem. Chrest. 151). *Rad.* D. 8|-1|22; A. 1|18 vel 19, &c. (2 Spec. C. Ph. Inst. from China.)

Hab. China seas, Indian ocean and Red sea. Canton (Vachell).

CARANX EQUULA, Temm. et Schl. F. J. Sieb. p. 111. pl. 60. f. 1. "*Rad.* D. 8|-1|24; A. 2|-1|23," &c. (F. Jap.)

The figure in the 'Fauna Japonica' has a near resemblance to Mr. Reeves's drawing β . 21, which is quoted above as representing *C. malabaricus*, but its profile is more sloping.

Hab. Sea of Japan.

CARANX NIGRIPES, C. et V. ix. p. 122 et p. 141 (*Olistes atropus*). *Mais parah*, Russell, 152; *Icon.* Reeves, 181; Hardw. 224.

The *Brama atropus*, Bl. Sch. p. 98. t. 23, seems to be also this fish, and Schneider indeed mentions the first dorsal and the spines before the anal, as he observed them in the dried specimen recumbent in their respective grooves. He also points out its Scomberoid characters. *Atropus* is therefore the prior specific name, but being compounded of Greek and Latin it is objectionable, and may be allowed to give place to the appellation of the same import proposed in the 'Histoire des Poissons.' M. Valenciennes states that a specimen preserved in Bloch's museum is labelled *Brama melampus* and *Scomber ciliaris*. Examples of the species from China exist in the British Museum and the Chinese collection at Hyde Park.

Hab. China sea and Indian ocean.

CARANX FLAVO-CÆRULEUS, Temm. et Schl. F. J. Sieb. p. 110. pl. 59. f. 2; *Icon.* Reeves, 213; Hardw. 204. Chinese name, *Hwang joo*, "Yellow milk" (Birch); *Wang joo*, "Yellow breast" (Reeves); *Wong u* (Bridgem. Chrest. 112).

A specimen of this fish exists in the Chinese collection at Hyde Park.

Hab. Seas of China and Japan.

CARANX CHRYSOPHRYS, var. *hyemalis*, C. et V. ix. p. 77? *Icon.* Reeves, 239; Hardw. 209. Chinese name, *Tung kwa tsang* (Birch); *Tong kwa tsong*, "Winter gourd" (Reeves). *Rad.* 8|-1|21; A. 2|-1|19, &c. (Reeves's drawing.)

This figure closely resembles that of *chrysophrys* in the 'Histoire des Poissons,' except that the snout is rather blunter; there is a small incurvature of the profile at the nostrils, the points of the dorsal and anal are scarcely so long, and the cheek, as well as the belly nearly to the anal spines, are represented scaleless. The golden tint of the eyebrow is very obscure. Length of figure 14 inches.

Hab. China sea. Seychelles?

CARANX MARGARITA, Richardson. *Icon. Reeves*, r, nullo numero; Hardw. *Acanth.* 205. Chinese name, *Hwang chang*, "Yellow bowels" (Birch).

This Caranx much resembles *C. flavo-ceruleus* or *cancroides* in its profile, its height being one-third of the total length, and the space between the snout and first dorsal flatly arched, not steep, as in the *Carangi*. The breast is scaly, but no scales are shown on the cheek, nor any teeth in the jaws. The arch of the lateral line terminates over the beginning of the anal and under the ninth ray of the second dorsal, the straight part being pretty strongly armed by about eighteen or twenty bucklers. The spines of the first dorsal are rather tall and stout, and the fin ends at the foot of the second. The fish has a pearly hue throughout, with some faint yellow tints on the upper half of the body and forehead. The caudal and anal are saffron-yellow, the first dorsal and ventrals French-gray, and the second dorsal greenish-gray with yellowish front rays. Length of figure 4.32 inches, height of body 1.50 inch.

Hab. Sea of China. Canton.

Citulæ.

CARANX CILIARIS, C. et V. ix. p. 129; Temm. et Schl. F. J. Sieb. p. 112. *Tchawil parah*, Russell, 151. *Rad.* D. 8|–1|21; A. 2|–1|18; P. 15. (Spec. C. Ph. Inst.)

Hab. Seas of China and Japan, Malay archipelago and Indian ocean.

SCYRIS INDICA, C. et V. ix. p. 145. pl. 252; Rüpp. Atl. taf. 33. f. 1; *Icon. Reeves*, a. 17; Hardw. 213. Chinese name, *Pih seu kung*, "White-bearded gentleman"; *Pih seu kung*, "White-bearded king" (Reeves); *Pak su kung* (Bridgem. Chrest. 36). *Rad.* D. 7|19; A. 1|16; C. 17 $\frac{1}{2}$; P. 17; V. 1|5. (Spec. Br. Mus.)

A dried specimen of this fish brought from Canton by Mr. Reeves was presented by him to the British Museum. It measures 12.25 inches in length; the height of the body is 5.65 inches, and the length of the head 3 inches. Three interspinous bones present their blunt edges before the recumbent spine, which precedes the seven dorsal spines.

Hab. China seas. Malay archipelago and Indian ocean.

EQUULA NUHALIS, Temm. et Schl. F. J. Sieb. p. 126. "pl. 67. f. 1" (not yet publ.); *Icon. Reeves*, g. 90. et b. 85 set of small figures; Hardw. 221 et 223. Chinese name, *Kow yaou*, "Dog's waist" (Birch).

Two specimens were brought from Canton by the Rev. George Vachell.

Hab. China and Japan.

EQUULA RIVULATA, Temm. et Schl. F. J. Sieb. p. 126. "pl. 67. f. 2" (not yet published); *Icon. Reeves*, c. 86; Hardw. 219. Chinese name, *Hwa shin lih* or *kin tsze*, "Flowery bodied —" (Birch).

The authors of the 'Fauna Japonica' mention that the specimens they examined were in bad condition, otherwise I should have hesitated in referring Mr. Reeves's most beautiful and elaborately finished drawing to the species established by them, on account of a difference in their relative heights. Mr. Reeves's figure shows the height of the body to be half the length to the base of the caudal; but the description in the 'Fauna Japonica' gives to it a more elongated form, and we have not seen the plate. The fish, as represented in Mr. Reeves's drawing, is brightly silvery, with pale, wood-brown, short undulating bars pretty closely ranged in two or three rows above the lateral line. They are continued down the sides by silvery streaks. The fins are pale, slightly ochraceous, with a brighter yellow tint at the beginning of the dorsal and anal.

Hab. Seas of China and Japan.

MENE MACULATA, Bl. Schn. p. 95. pl. 22 (*Zeus*). C. et V. x. p. 104. pl. 285; Temm. et Schl. F. J. Sieb. p. 127. "pl. 67. f. 3" (not published). *Menè Anne-Caroline*, Lacép. v. pl. 14. f. 2.

Hab. Seas of China and Japan and Indian ocean.

XYPHIIDÆ, Agassiz.

HISTIOPHORUS ORIENTALIS, Temm. et Schl. F. J. Sieb. p. 103. pl. 35.

Hab. Sea of Japan. Malay archipelago.

CEPOLIDÆ.

CEPOLA LIMBATA, C. et V. x. p. 402; Voy. de Krusenst. pl. 60. f. 1.

Hab. Sea of Japan.

CEPOLA MARGINATA, C. et V. x. p. 402; Krusenst. pl. 60. f. 1.

Hab. Sea of Japan.

CEPOLA KRUSENSTERNII, Temm. et Schl. F. J. Sieb. pl. 71. f. 1.

The authors of the 'Fauna Japonica' are inclined to include the two preceding species in this one. The British Museum possesses one of Bürger's specimens.

Hab. Sea of Japan.

CEPOLA HUNGTA, *Icon.* Reeves, β . 2; Hardw. 228. Chinese name, *Hung tae*, "Red girdle" (Birch); "Red tape" (Reeves); *Hung tai* (Bridgem. Chrest. 5).

We cannot refer this figure to any of the foregoing *Cepolæ*, nor, on account of the numbers of the rays, to *abbreviatus*, of which we have seen neither figure nor detailed description. Height at the pectorals equal to the length of the head, or to one-tenth of the whole length of the fish. The upper and under profiles incline evenly and gradually to each other, and meet in an acute point at the tail. The fins are highest anteriorly and diminish in height like the body, also meeting in an acute point, the caudal not being distinguished by longer rays from the adjoining parts of the other two vertical fins. The anal is higher than the dorsal. Ventrals exactly under the pectorals. The whole surface of the body is divided into almost square rhombs by yellow lines, and there is a nacre spot in the centre of each. There are only ninety-four of these rhombs in a line between the gill-opening and point of the tail, so that they are greatly larger than the scales of the other *Cepolæ*. The general tint is pale ochre-yellow passing into reddish-orange on the back, and there are eighteen equidistant gamboge-yellow spots on the middle of the sides, the yellow tint confined to the lines dividing the scales from one another. These spots are much larger than those of *krusensternii* and not in pairs. The orbits and top of the head are shaded with carmine, and there is a carmine stripe along the middle of the dorsal, the edge of the fin being saffron-yellow and the base pearl-gray. The anal is lake at the base, white along the middle, and saffron-yellow edged interiorly with lake on the border. Pectorals yellow. Ventrals lake. Length of the drawing 12 inches. Height of body at ventrals 1.15 inch. Height of dorsal anteriorly 0.48; of anal anteriorly 0.70 inch.

Hab. China seas. Canton.

LOPHOTES CAPELLEI, Temm. et Schl. F. J. Sieb. p. 132. pl. 71 et 72.

Hab. Sea of Japan.

Tribus HETEROSOMATA.

Fam. PLATESSOIDEÆ.

PLATESSA CHINENSIS, Lacépède, iv. p. 595 et 638. pl. 14. f. 1? (*Pleuronectes*), Gray, Ind. Zool. pl. 94. f. 1; *Icon.* Reeves, 107, *a* et *b*; Hardw. Malac. 261, 262. Chinese name, *Hwa tsäng pe*, "Variegated boiler nose" (Birch); *Hwa tsang pe* (Reeves). *Icon.* piscium 24 a picture Sinensi, &c.

Mr. Reeves figures two examples of this species, one with the eyes on the right side, the other on the left; and the figure given by Mr. Gray in Hardwicke's 'Illustrations of Indian Zoology,' was drawn from one of Mr. Reeves's Canton specimens deposited in the British Museum. The general colour of the upper side is dull umber, clouded faintly with liver-brown, with scattered small black spots, each surrounded by a pale ring. The fins are also brown, and the vertical ones are marked by rather large, well-defined, roundish, dark liver-brown spots, most crowded on the caudal, which is rhomboidal. Length 6 and 10 inches.

Hab. Coasts of China. Canton.

PLATESSA CHINENSIS, var.? *cæruleo-oculea*. *Icon.* Reeves, 204; Hardw. Malac. 263.

This seems to be from the drawing, for we have seen no specimen, to be a pale variety of *chinensis*. The ground colour is bluish-gray, clouded with blackish-gray, and the spots are dark blue with sky-blue borders; the vertical fins are tile-red on their basal halves, and

bluish- or blackish-gray towards their borders. The spots as in *chinensis*, with the addition of a few on the ventrals.

Hab. Chinese coasts. Canton.

PLATESSA VELAFACTA, *Icon.* Reeves, 105; Hardw. Malac. 264. Chinese name, *Hwa po pung*, "Variegated sail-fish" (Birch); *Fa po pang*, "Variegated broken mat" (Reeves); *Fa po pung* (Bridgem. Chrest. 145).

This drawing differs little in appearance from 107, *Platessa chinensis*. The ground tint and shadings are nearly the same, the black spots want the pale borders, and the blotches on the fins run into each other and form a border of grayish-black. The caudal is less rhomboidal and more rounded at the end.

Hab. Coasts of China. Canton.

PLATESSA BALTEATA, *Icon.* Reeves, 205; Hardw. Malac. 259. Chinese name, *Po ping*, "Broken sail" (Birch); *Po pung*, "Broken mat flounder" (Reeves, Bridgem. Chrest. 54).

This has the same Chinese appellation with *chrysoptera* which follows, the same regularly oval form and the brownish-red ground tint, interspersed with a few small darker points and crossed by several dark brown bands, one on the nape, another broad one behind the pectorals, a forked one further back, and a narrow one on the tail. The vertical fins are speckled with dark brown. Caudal rhomboidal. Length of drawing $7\frac{2}{3}$ inches.

Hab. Coasts of China. Canton.

PLATESSA CHRYSOPTERA, Bloch, Schn. (*Pleuronectes*), p. 151? *Icon.* Reeves, 104; Hardw. Malac. 260. Chinese name, *Po pung*, "Broken sail" (Birch); *Po pang*, "Broken mat" (Reeves); *Po pung* (Bridgem. Chrest. 54).

Mr. Reeves's drawing 104 answers better than any other one in his portfolio to the short characters of *chrysoptera* contained in Schneider's edition of Bloch, and this is our only reason for considering it to be the same species.

The ground tint of the drawing is brownish-red or orange-coloured brown, with numerous minute specks of umber and irregular rings of the same equally dispersed over the body with paler dull areas. The fins are wax-yellow, with reddish rays spotted with brown. Caudal fin subrhomboidal. Length of specimen 10 inches.

A specimen in the Chinese collection at Hyde Park has conical teeth on the lower jaw and near the symphysis of the upper one, with smaller ones laterally, and a prominent smooth acute interorbital ridge.

Hab. Chinese coasts. Canton.

PLATESSA ASPERRIMA, Temm. et Schl. F. J. Sieb. pl. 91. (Letter-press not yet published.)

Hab. Sea of Japan.

HIPPOGLOSSUS DENTEX, Richardson, Ichth. of Sulph. p. 102. pl. 47. *Icon.* Reeves, 195; Hardw. Malac. 267. Chinese name, *Tso how*, "Mouth on the left" (Birch); *Tso hau*, "Left mouth" (Reeves); *Tso hau* (Bridgem. Chrest. 147). *Rad.* B. 7; D. 47; A. 33; C. 18; P. 17; V. 1|5.

Hab. Coasts of China. Canton.

HIPPOGLOSSUS ORTHORHYNCHUS, *Icon.* Reeves, 106; Hardw. Malac. 266. Chinese name, *Ching pe*, "Straight nosed" (Birch); "True nose" (Reeves); *Ching pi* (Bridgem. Chrest. 146).

We have seen no specimen of this. The figure represents the dorsal as commencing much further back than in the preceding; the ground colour as broccoli-brown, with a darker clove-brown bar running between the middles of the dorsal and anal, and blending with bars or shadings of the same tint which cover shoulder and arch over the pectoral. The vertical fins are also broccoli-brown, with a few obscure darker blotches. Pectorals yellowish-brown with fine dark speckling.

Hab. Coasts of China. Canton.

HIPPOGLOSSUS GONIOGRAPHICUS, *Icon.* Reeves, 254; *Hardw. Malac.* 265.

The ground colour of this drawing is yellowish-brown, marked like a map with large angular blotches of dark umber- or liver-brown, which extend to the caudal, and one or two of them also run out on the dorsal and anal. The membranes of the fin are between yellowish-brown and rust-coloured, and their rays are obscurely speckled. Five or six umber-brown bars cross the pectoral. Length of drawing $8\frac{1}{2}$ inches.

Hab. Coasts of China. Canton.

RHOMBUS CINNAMOMEUS, Temm. et Schl. F. J. Sieb. pl. xciii. (Letter-press not yet published.)

Hab. Sea of Japan.

SAMARIS CRISTATUS, Gray, *Zool. Misc.* p. 8; *Icon.* Reeves, 171; *Hardw. Malac.* 268. "*Rad.* D. 61; A. 51; C. 16; P. 4; V. 5." (Gray, *l.c.*)

Hab. Coasts of China. Canton.

SOLEA OMMATURA, Richardson. *Icon.* Reeves, β . 13; *Hardw. Malac.* 273, 275. Chinese name, *Hwa tat sha*, "Flowered or variegated sole" (Reeves); *Hwa ta sha**, "Striped or flowery sole," also *Woo teèn yě*, "Black guava leaf" (Birch); *Fa tat sha* (Bridgem. *Chrest.* 204). *Rad.* D. 70; A. 60; P. 11-11; V. 3 vel 4. (*Spec. Camb. Phil. Inst.*)

Two of the Rev. George Vachell's specimens of this fish exist in the Cambridge Philosophical Institution, and small ones are very common in the China insect-boxes. It belongs to the subdivision of the genus which is characterized by the blending together of the three vertical fins, and is very much like the Indian *Solea zebra*, but it is not so much elongated, and has a peculiar eye-like mark on the caudal fin, formed by several yellow spots, inclosed by a bright yellow parallelogram, of which one side is deficient. The body is crossed by about twenty-three vertical whitish bars, alternately broader and narrower, and bent backwards, where they run out on the fins. The intermediate spaces are wood-brown on the body and blackish on the fins; short bars radiate forward from the eyes on the snout.

The eyes are on the right side, and are small and nearly contiguous. The teeth, if any exist, are invisible to the naked eye. The left lips and gill-membranes are fringed, and the latter are united to the pectorals, the union of the left gill-membrane being more conspicuous. The scales on both sides of the fish are strongly ciliated and run up on the fin-rays. The lateral line is straight. Length of the figure $8\frac{1}{4}$ inches. The specimens are smaller.

In form this species is intermediate between the *Jerree potoo*, B, Russell, 81, and *Jerree potoo*, C, 82; and in the geminate distribution of its vertical stripes it agrees with neither.

Hab. Coasts of China. Canton. Sea of Borneo.

SOLEA OVALIS, Richardson. *Icon.* Reeves, 179; *Hardw. Malac.* 179. Chinese name, *Teou pan yu* (Birch).

This greatly resembles *Pleuronectes pan*, Buch. Hamilton, pl. 24. f. 42; but the hinder end is less acute, the form being a perfect oval, equally blunt both ways. The mouth also is cleft beyond the eyes, which appear to be more approximated, and the dark liver-brown spots are more numerous. The ground colour is reddish-brown.

Hab. Coasts of China.

SOLEA FOLIACEA, Richardson. *Icon.* Reeves, β . 5; *Hardw. Malac.* 271.

Chinese name, *Neen ye tze*, "Guava-leaved sole" (Birch); *Neem yeep tze* (Reeves); *Nim ip tsai* (Bridgem. *Chrest.* 203; *Icon.* Reeves, *h.* 91; *Hardw. Malac.* 269).

This differs little from the preceding, but the mouth is not so much cleft, the eyes smaller and further apart, like those of *Pleuronectes pan*, and the spots are composed of a congeries of smaller ones. The ground colour of drawing β . 5 is pale reddish-brown, but in the smaller one, *h.* 91, it is olive-green.

Hab. Coasts of China. Canton.

SOLEA OVATA, Richardson. *Rad.* D. 65; A. 47; C. 21; P. 9, &c. (*Spec. Camb. Phil. Inst.*)

In this species the rounded caudal is well distinguished from the other two vertical fins,

* The term *tā shā*, applied to the sole, means "to beat the sand."

though they are united to its base by membranes. The dorsal commences over the anterior edge, and there is no membranous edge from thence to the mouth, which is a little way behind the very obtuse snout. Form ovate and very regular. Teeth nearly imperceptible and existing on the reverse side of mouth only. A band of cuticular filaments commences on the under lip and extends backwards to the lower edge of the gill-cover, fringing the gill-opening on the pale side only. The lower eye touches the upper lip, and the eyelids of both eyes are minutely scaly. Scales on both sides very strongly ciliated, but rather more rough on the coloured or right side; equally large on the head as elsewhere, and covering the fins in broad belts above and below. Lateral line straight. Upper side of the four specimens, which are preserved in spirits, grayish-brown, with a minute mottling a little deeper than the general tint, and some scattered black specks, which are not round. Under side of fish lead-gray, unspotted. Pectorals blackish behind, and on the outer half on the anterior surface. Caudal spotted. Length $3\frac{1}{2}$ inches. Height $1\frac{1}{2}$.

Hab. China seas. Canton (Rev. George Vachell).

PLAGIUSA AURO-LIMBATA, Richardson. *Icon.* Reeves, 151; Hardw. Malac. 283. Chinese name, *Kin peen tae shae*, "Golden-winged sole" (Reeves); *Kin peen ta sha* (Birch); *Hak tim tar sha* (Bridgem. Chrest. 210).

This fish, judging solely from the drawing, is elliptic anteriorly and tapers gradually to the end of the moderately acute tail, the height of the body, excluding the fins, being contained three times and a quarter in the length. The snout appears to be edged with membrane, and the dorsal commences above the level of the eye and rather before the mouth. Eyes less than a diameter of the orbit apart and placed over the middle of the mouth. Head one-fifth of the total length. Scales of moderate size. Lateral line quite straight. No ventrals shown in the figure. Colour uniform chestnut-brown, without spots, the fins being merely a little lighter and the fore part of the anal alone varying, being bluish-gray. Length of figure $10\frac{1}{2}$ inches.

Hab. Coasts of China. Canton.

PLAGIUSA PUNCTICEPS, Richardson. *Icon.* Reeves, m. 95; Hardw. Malac. 282. Chinese name, *Nae pih* (Birch).

This figure corresponds with the preceding in outline, but the dorsal does not appear to reach before the eyes. Lateral line straight. Scales moderate. Colour yellowish-brown, with irregular blotches of a much deeper tint of the same scattered over the body, and many dark specks on the head. Length of figure $4\frac{1}{2}$ inches.

PLAGIUSA NIGRO-LABECULATA, Richardson. *Icon.* Reeves, 152; non Hardw. Chinese name, *Hih teen ta sha*, "Black-spotted sole" (Birch, Reeves); *Hak tim tar sha* (Bridgem. Chrest. 210).

This fish has not the symmetry of *auro-limbata*, but its height has the same relative proportion to its length, and its colour is the same with the addition of about a dozen roundish black marks on the fore-part of the body and humeral region. Dorsal fin commencing posterior to the eyes. If the artist has been inaccurate in indicating the origin of the dorsal in this and the two preceding figures, they may be all varieties of one species.

Hab. Coasts of China. Canton.

PLAGIUSA GRAMMICA, Richardson.

Two specimens of a *Plagiusa*, closely resembling the preceding two in form, exist in the museum of the Cambridge Philosophical Institution, to which they were presented by the Rev. George Vachell. The height of the body is contained three times and three-quarters in the total length, and the length of the head five times and two-thirds. Snout edged by a skinny membrane without rays, the dorsal commencing above the eyes and before the tip of the lower jaw. Eyes small and almost contiguous. Scales smaller than those shown in the figure of *auro-limbata*, strongly serrated on both sides of the fish. Lateral line straight. Ventrals situated in the same plane with the anal, one composed of four rays being distinct, and the other joined to the anal, and as it were forming its first four rays. Both are pointed. The anus is on one side of the second ventral and opposite to its last ray. Fins not scaly. Colour dark chestnut-brown, slightly streaked or shaded with umber, and marked by three irregular rows of dark vertical lines like Chinese characters. Length of specimen $3\frac{3}{4}$ inches.

Hab. Coasts of China. Canton.

PLAGIUSA ABBREVIATA, Gray, Hardw. Ill. ii. pl. 94. f. 3. drawn from Mr. Reeves's China specimen; *Icon.* Reeves, β . 17; Hardw. Malac. 284.

Chinese name, *Tze leen ta shä*, "Minute-scaled sole" (Reeves); *Sai lin tat sha* (Bridgem. Chrest. 205).

Besides the straight central lateral line, another runs along the back at a little distance from the fin, and is continued round the snout to the mouth; and a third runs in like manner near the edge of the belly forward to the gill-opening. A transverse line crosses the nape, connecting the upper and middle lines, and another cross line, originating from the true lateral line a little further forwards, descends on the temples, and there divides; one branch encircling the gill-cover; and another, descending the preoperculum and running forwards to the point of the lower lip. Eyes over the posterior corner of the mouth. Colour umber-brown, the fins yellowish-brown without spots, but the gill-cover and middle of the body are darker and shading off. The defined black patch which includes the gill-cover in Mr. Gray's figure is merely a darker brown shading off in Mr. Reeves's drawing.

Hab. Coasts of China. Canton.

PLAGIUSA MELAMPETALA, Richardson. *Icon.* Reeves, 150; Hardw. Malac. 285. Chinese name, *Hih lèen ta sha*, "Black-scaled sole" (Birch); *Hih lin tat sha* (Reeves); *Hak lun tar sha* (Bridgem. Chrest. 207).

This is a large scaled species with two lines, as in *bilineata* (Bloch, 188, the *Jerree potoo*, E, Russell, 74, and *Pl. potous*, Cuv., *Jerree potoo*, D, Russell, 73), but with the dorsal not shown further forwards than the gill-opening. The general colour is dark chestnut-brown, with an obscure clouding of umber-brown, a large grayish blotch behind the gill-openings, and another near the hinder part of the anal. The fins are bluish- or blackish-gray. Eyes over the mouth. Height of body equal to the length of the head, or to one-fourth of the length of the body, excluding the fins. Length of figure $13\frac{1}{2}$ inches.

Hab. Coasts of China. Canton.

PLAGIUSA FAVOSQUAMIS, *Icon.* Reeves, β . 50; Hardw. Malac. 281. Chinese name, *Meih lèen ta*, "Small-scaled sole" (Birch); *Meih lin tat sha*, "Close-scaled sole" (Reeves); *Mat lin tat sha* (Bridgem. Chrest. 206).

This species has proportionally larger scales than the preceding one. The dorsal commences over the middle of the mouth and before the eyes. The mouth has a smooth flesh-coloured edge, and the form of the body is elongated, its height equalling the length of the head, and being contained four times in the total length. Colour chestnut-brown, darker along the middle of the back, and each scale marked near the margin by a streak of umber-brown. Length about $9\frac{1}{2}$ inches.

Hab. Coasts of China. Canton.

Tribus ———?

Fam. SILURIDÆ.

SILURUS XANTHOSTEUS, Richardson, *Ichth. of Voy. of Sulph.* p. 133. pl. 56. f. 12-14. *Icon.* Reeves, 102; Hardw. Malac. 142, 143 (duplicates). Chinese name, *Hwang küh*, "Yellow bone" (Birch); *Hwang hwä* (Reeves); *Wong kwat u* (Bridgem. Chrest. 190).

The British Museum possesses Chinese examples of this fish presented by Mr. Reeves, and two specimens from Chusan, which were collected there by Dr. Cantor, and came from him through the India House, labelled *S. punctatus* and *nanus*. The labels have evidently been accidentally transposed, and could not have been attached by Dr. Cantor to these specimens, as they want the black lateral spots and black edges to the pectorals, which he mentions in his description of *punctatus*, and no account of a species named *nanus* is contained in his paper on the *Fauna* of Chusan.

Hab. Canton (Reeves). Chusan (Cantor).

SILURUS SINENSIS, Lacép. v. pp. 58 et 82. pl. 2. f. 1 (*Le silure chinois*). M'Clelland, *Calc. Journ.* iv. p. 402. *Icon.* Reeves, 131; Hardw. Malac. 141. Chinese name, *Lèen yu*, "Sickle fish" (Birch); *Lin yu* (Reeves); *Lim u* (Bridgem. Chrest. 191).

This and the preceding species belong to the group of *Siluri*, which have short faces and projecting lower jaws, embracing the upper lip when the mouth is shut, and giving them, together with an accompanying elevation of the shoulder, more or less the aspect of a *Schilbe*. *S. xanthosteus* is distinguished at once from the present species by the union of the anal and

caudal, as in *S. glanis* or *asotus*. Lacépède's figure of *S. sinensis* is too rude to be of much use, and we are quite of M. Valenciennes' opinion when he says that it is by no means precise enough to serve for the establishment of a species. Mr. McClelland has however had an opportunity of examining a *Silurus* from Chusan, which he has referred to Lacépède's species; and Mr. Reeves's drawing above-quoted answers better to the description of the colours and markings of *sinensis* than to any species introduced into the 'Histoire des Poissons.' His drawing represents a fish with the nape but sparingly elevated, and having a caudal slightly notched in the middle with rounded equal lobes, the lower one distinct from the anal. The maxillary barbel reaches nearly to the end of the pectoral; the barbels of the lower jaw are not quite half as long. The lateral line runs straight, a little above the mid-height, and is marked by a series of yellowish white points, which are met at right angles by about fourteen short rows of the same kind of dots descending at regular intervals from the back. The ground colour of the body is oil-green passing into yellowish-gray, and is reticulated by irregular meshes of neutral tint of a deeper colour. The meshes disappear in the darker hue of the summit of the back which approaches to blackish-green, and do not spread over the belly, which is white; but they descend lower at the anus, and include the posterior two-thirds of the anal. The ground colour is mostly silvery below the lateral line, but a buff-coloured band runs along the base of the anal, reticulated like the rest of the body. The dorsal, caudal and border of the anal are oil-green; the basal part of the anal being lilac-purple, with the darker reticulations posteriorly. The pectorals are lilac at the base, dull green on the disc, and have a yellow border. The ventrals are pale greenish-yellow with a lilac tint. The upper parts of the head are yellowish-brown with a purplish blush and without spots. Length of the figure $14\frac{1}{2}$ inches.

Hab. Canton. Chusan.

"*SILURUS MYSORICUS*, C. et V. xiv. p. 364. *Silurus duda*, Buch. Hamilt. p. 152; McClelland, Calcutta Journ. iv. p. 402."

These references are given entirely on the authority of Mr. McClelland. Having the Indian fish under his eye, his opportunity for comparing it with his Chusan specimen is good; and it is important that a scrupulous comparison should be made, as this is one of the very few instances in which the same species of freshwater fish has been detected in India and China. The pointed caudal lobes distinguish this species from the foregoing ones.

Hab. Chusan (McClelland).

"*SILURUS BIMACULATUS*, Bl. 364; C. et V. xiv. p. 360; McClelland, Calc. Journ. iv. p. 401."

Hab. Chusan (McClelland).

"*SILURUS PUNCTATUS*, Cantor, Ann. Nat. Hist. ix. p. 30."

"*S. supernè nitidè olivaceo-viridescens sive brunnescens, seriebus duabus punctorum nigrorum infra lineam lateralem; abdomine albo-flavescenti; alis dorsalibus, caudalibus analibusque nigris; ventralibus albo-flavescentibus; pectoralibus latè nigro marginatis. Cirrhi $\frac{2}{3}$; Radii: D. 5; A. 80; C. 15; P. $1\frac{1}{5}$; V. 14; Br. 5.*"

"*Hab.* Fresh and brackish water in the island of Chusan." (Cantor, *l. c.*) No specimen.

SILURUS JAPONICUS, Temm. et Schl. Faun. Jap. Sieb. Rad. D. 5; A. 72; C. 17; P. $1\frac{1}{11}$; V. 12. (Spec. Br. Mus., 11 inches long.)

The part of the 'Fauna Japonica' relating to this species is not yet published, but we have compared the specimen with *S. xanthosteus*. The ventrals are farther behind the dorsal than in that species, and the maxillary barbel not longer than the head. Short branchlets descend at intervals from the lateral line.

Hab. Sea of Japan.

? *BAGRUS CRINALIS*, Richardson. Icon. Reeves, 217; Hardw. Malac. 179 (et 180 dupl.). Chinese name, *Sang maou* (Birch); "Growing hair" (Reeves). Length of fig. 10 inches.

This drawing closely resembles *Bagrus sagor*, Buch. (Icon. Hardw. Malac. 169 et 176; C. et V. xiv. p. 446), and also *B. bilineatus*, C. et V. 454; Russ. 169; but we are prevented from referring it to either of these species by its rather smaller anal and considerably larger ventrals. Its profile is sufficiently like that of *bilineatus* or *dedit-jellah* (Russ.) to need no further description, except that the ascent from the snout to the dorsal is a continuous straight

line without any rounding before the dorsal. The maxillary barbels reach to the gill-opening, the exterior submandibular pair are half as long, and the interior pair a quarter as long. The operculum is finely veined, and the roughness of the nuchal plate is shown in the drawing by fine gold points. The lateral line is flatly arched over the pectoral, and takes a straight course from the tip of that fin to the caudal rather above mid-height. The points of the ribs form an oblique line from the shoulder to the anal. The dorsal and pectoral spines are slender and serrated in front: their posterior teeth, if they possess any, are not shown in the drawing. The top of the head, nape and back is sap-green, with fine parallel streaks of a deeper tint, bent *en chevron* near the dorsal line, and disappearing at the lateral line; the sides and belly are silvery with a purplish reflexion. There are some crimson tints round the mouth, and purplish ones at the union of the gill-pieces and on the breast; also a greenish-yellow border round the end of the tail embraced by the caudal. The dorsal is celandine-green, with darker rays tinged with crimson at the base. The adipose fin is yellow, with a black spot on the edge. The pectorals and ventrals have crimson-coloured rays and buff membranes. The anal is sulphur-yellow and the caudal a dingy wax-yellow. This drawing agrees in several particulars with the description of *Arius ocellatus* noticed below.

Hab. Canton.

BAGRUS LIMBATUS, Richardson.

None of Mr. Reeves's drawings represent this fish, which was brought from Canton by the Rev. G. Vachell; the only one that it resembles in having eight barbels being the *Pimelodus? fulvi-draco* noticed below. From this it is distinguished by all the fins being edged with black, and the specimen shows no traces of the peculiar markings of *fulvi-draco*. I examined it cursorily, and noted down only a few of its characters. There is a short villiform dental plate on the vomer, set more densely and with shorter teeth than the jaws, and continued without a break over the mesial line. The casque terminates over the base of the pectorals, but sends out a narrow styloid process which touches the small chevron of the second interspinous bone. The adipose fin rises imperceptibly from the dorsal line, and the ventrals are smaller than those of *B. ? vernalis*, and do not reach to the anus. The ventrals have six rays, the last of which is divided to the base. A supra-axillary plate is half the length of the pectorals, and the nasal cirrhus is short.

Hab. Canton. Specimen in the Cambridge Philosophical Institution.

? BAGRUS (*an PIMELODUS?*) BOUDERIUS, Richardson. *Icon.* Reeves, 203; *Hardw.* 183. Chinese name, *New yu*, "Buffalo fish" (Birch); *Nou yu*, "Cow fish" (Reeves); *Ngau u* (Bridgem. *Chrest.* 194).

A specimen of this fish exists in the Chinese collection at Hyde Park, but we have not examined the palate so as to ascertain from its dentition whether it is properly placed in this genus or not. If it be a *Bagrus* it belongs to the group which have eight barbels, a long anal and a comparatively short adipose fin. It comes nearest to *B. vacha* (Buch. Ham.) of any member of the group described in the 'Histoire des Poissons,' but may be at once distinguished by its much smaller mouth and fleshy lips. The head, viewed in profile, is depressed, tapering and rather pointed, with the eye rather nearer to the gill-opening than to the end of the snout. The lower jaw is shorter than the snout, and the mouth is not cleft so far back as the posterior nostrils, which are about midway between the eye and end of the snout. The nape rises suddenly in an arch from the hind head, and then runs backwards with little ascent to the first dorsal. The height of the body there is equal to the length of the head, or to one-fifth of the total length of the fish. The maxillary barbels are rather longer than the head: the exterior submandibular ones are a third shorter, while the nasal barbels and the interior submandibular ones are a little longer than the quarter of the length of the head. The lateral line is arched at the commencement, and then runs nearly straight from before the first dorsal to the caudal, a little above the middle height of the body. [In *B. buchanani*, Val., the lateral line is straight from end to end.] The pectoral spine is strong, and is strongly serrated towards its tip interiorly. A triangular plate proceeding from the humeral chain is shown very boldly in the figure above the fin. The dorsal spine is drawn without serratures, taller than the soft rays, pretty stout and rather spindle-shaped, with a tapering acute point. Six soft rays are shown. The ventrals are pretty large, but smaller than the pectorals; the anal long, containing above thirty rays; the adipose fin of a moderate size, and the caudal deeply forked, but with the lobes rather obtuse and equal. The colour on the dorsal aspect is dark mountain-green or greenish-gray, passing high on the sides into sienna-yellow, which continues down to the pale lilac edge of the belly. There are no spots. The fins have all more or less of lake or crimson-red with greenish rays. The two colours are most distinctly separated on the anal, the base being rose-red or carmine, and the outer half grass-green.

The base of the caudal is oil-green, the middle parts crimson, and the hinder edge blackish-green. The lips are orpiment-orange. Length of the figure $16\frac{1}{4}$ inches.

Hab. Canton (Reeves). No specimen.

In the 'Description of Animals,' &c., which we have repeatedly quoted, there is a sketch (fig. 162) of a Siluroid with a short adipose fin and long anal, which I should have referred to *B. boudierius*, but for the shortness and number of the barbels, which are stated in the text to be only four; and only two are shown in the drawing, the maxillary one, which is the longest, being shorter than the head, and the submandibular one still smaller. The nostrils are shown without cirrhi, and the belly is more prominent than that of Reeves's *boudierius*. In the text (p. 191) the head is said to be "naked and somewhat depressed, the body compressed, smooth and gray. Breast prominent. Ventral in middle of the abdomen. The rays B. 14; D. 8; A. 30; C. 28; P. 13; V. 6. Length 20 inches."

Hab. Canton river.

? *BAGRUS VACHELLII*, Richardson. *Rad.* D. $1\overline{7}$; A. 23; C. $17\frac{+}{4}$; P. $1\overline{8}$; V. 6; *Cirrhi* 8.

A specimen of this fish exists in the collection of the Cambridge Philosophical Institution, to which it was presented by the Rev. G. Vachell. In the form of the adipose fin and general outline it resembles Mr. Reeves's drawing 203, which is described above under the appellation of *Bagrus? boudierius*, but the anal fin is not so extensive. In the hasty record I made of its characters, I unfortunately omitted to note the exact nature of the dental plates on the roof of the mouth, having merely written that the teeth are disposed in broad, close shorn villiform plates; so there remains an uncertainty as to the genus which cannot be cleared up without a re-examination of the specimen. The mouth is small, and the under jaw is shorter than the snout, which is round. The maxillary barbels are as long as the head and larger than the others; the interior submandibular pair equal the nasal ones, and are shorter than the exterior submandibular ones. They are all slender. The dorsal spine is smooth in front, but is armed with recurved teeth behind. The pectoral spine is also smooth in front, but it is strongly toothed behind. Many short rays are incumbent on the base of the caudal, above and below. Three front rays of the anal are short and graduated, and the last dorsal ray is divided to the base. The specimen is five inches long. In the number of the anal rays this specimen nearly agrees with *Arius ocellatus* introduced below.

Hab. Canton.

ARIUS FALCARIUS, Richardson, *Ichth. of Voy. of Sulph.* p. 134. pl. 62. f. 7-9. *Icon.* Reeves, 101; *Hardw. Malac.* 184. Chinese name, *Lēen yu*, "Sickle fish" (Reeves, Birch); *Lim u* (Bridgem. *Chrest.* 193). Length of drawing $10\frac{1}{2}$ inches.

Hab. Canton. Spec. Brit. Mus.

ARIUS SINENSIS, C. et V. xv. p. 72.

Hab. "Touraine" (*Hist. des Poiss.*).

ARIUS OCELLATUS, Bl. Schn. (*Silurus*), 378; C. et V. xv. p. 104. *Silurus maculatus*, Thunb. *Act. Stockh.* 1792. pl. 1. f. 1 et 2.

The only one of Mr. Reeves's drawings which has anything like an eyed spot on the adipose fin is the one described above as the *Bagrus? crinalis*; but this is scarcely a distinguishing mark, as many of the *Siluridæ* have the adipose more or less broadly edged with black.

Hab. Japan.

? *GALEICHTHYS STANNEUS*, Richardson. *Icon.* Reeves, 238; *Hardw. Malac.* 177. Chinese name, *Seih yu*, "Tin fish" (Birch); *Seih yu*, "Tin fish" (Reeves). *Seih* means also the glingling ornaments of a horse.

I have referred this figure to *Galeichthys* on account of its resemblance to *G. feliceps*, C. et V. pl. 424, but it may nevertheless be a *Pimelodus*. The head seems to be quite smooth above, with less appearance of a casque than in the figure of *feliceps* above-quoted. The granulations of a narrow interparietal process and a small crutch at the base of the dorsal spine are however shown. The head is wide and depressed, with a rounded snout, and forms about one-fourth of the total length of the fish. The height of the body is equal to rather more than a fifth of the length. The nasal orifices are round without either valves or barbels. The maxillary barbels are shorter than the head, but are longer than the exterior subman-

dibular pair, and more than twice as long as the interior pair. There is a large triangular plate of the humeral chain above the pectoral which is covered with smooth skin. The dorsal and pectoral spines are long and rather slender, the former being equal to two-thirds of the height of the fish and serrated both before and behind. The latter is also serrated on both sides, but only at the tip. The adipose fin rises abruptly from the back, and is small; the anal is of moderate size; behind these fins the tail becomes narrower than usual in a siluroid, but again expands where it is embraced by the base of the caudal. The caudal is deeply forked with acute lobes. The lateral line is arched at the shoulder, and descends to the middle height of the body over the ventrals, its course to the caudal fin being straight from thence. The general colour is violet-purple passing into Scotch-blue, and gradually changing to a bright silvery tint on the lower part of the sides and under surface of the head. A series of chevrons are shown between the ventrals and pectorals evidently corresponding to the ribs. The under fins are bluish, the dorsal and caudal purplish brown. Length of the drawing, $15\frac{1}{4}$ inches. The Chinese name probably refers to the colour of the body.

Hab. Canton.

PIMELODUS GUTTATUS, Lacépède, v. pp. 96 et 113. pl. 5. f. 1; C. et V. xv. p. 143. *Icon.* Reeves, 129 et 130; Hardw. Malac. 161. Chinese name, *Hwa han*, "Flowery or spotted chiton" (Birch); *Ta kan*, "Variegated kan" (Reeves); *Fa kom* (Bridgem. Chrest. 196). *Rad.* D. 1|6; A. 1|8; C. 15; P. 1|8; V. 8. (Fig. Reev.) Length of fig. 129, $13\frac{1}{2}$ inches; of 130, $16\frac{1}{4}$ inches.

This species was known to Lacépède only by a Chinese drawing; and though Mr. Reeves's drawings present both a top and side view whereby we can perceive that the fish has no casque, yet from our ignorance of the denition we cannot say positively that it belongs to the genus *Pimelodus* as constituted in the 'Histoire des Poissons.' It has considerable resemblance to *Bagrus cavasius*, possessing the eight barbels, long adipose and short anal which characterise the group to which that species belongs, and which is equivalent to the genus *Porcus* of M. Geoffroy St. Hilaire. On the other hand, it has also the external characters of the *Pimelodes*, with a round head destitute of a casque and with eight barbels. In profile the head appears conical and rather slender, with an acute snout which projects beyond the lower jaw, the face and nape rising in a straight gentle acclivity to the dorsal. Viewed from above, the snout is broadly rounded; there is no appearance of a casque, and the distance between the eyes is equal to a third of the length of the head. The head forms one-fourth of the length of the fish, caudal excluded; and the height of the body at the commencement of the dorsal is nearly equal to a sixth of the length, caudal included. The maxillary barbels reach to the tip of the pectoral. The outer pair of submandibular barbels are less than half that length, and the other two and the nasal pair are still shorter. The pectoral spine is stout and very strongly toothed behind, but no teeth are shown on the dorsal one in either figure. The dorsal terminates over the first ventral ray, and the adipose fin commencing over the axilla of the ventrals extends far past the anal and almost to the caudal, being nearly equal in length to a third of the fish. The caudal is deeply notched with thick, rounded equal lobes. The lateral line has a very slight decurvature as far as the ventrals, but is otherwise nearly straight and rather nearer to the belly than to the back. The supra-axillary plate of the humeral chain is drawn narrow and rather long. The colour of the back, top of the head and breast is brownish purple-red; the sides and belly white, with a faint wax-yellow or siskin-green reflexion. Many transverse bars are shown, that meet *en chevron* near the back, and again less sharply at the lateral line, which is green. The body, adipose fin, and caudal and the rays of the dorsal and ventrals are marked with many scattered black spots of irregular shapes and sizes. The dorsal, adipose and caudal are yellowish-brown at the base, the rays of the pectoral are greenish, and those of the ventrals and anal carmine. The membranes of most of the fins appear to be thin and transparent.

Icon. Reeves, 132; Hardw. Malac. 162. Chinese name, *Han yu*, "Chiton fish" (Birch); *Kan yu*, "*Han* tiled-fish" (Reeves); *Kom u* (Bridgem. Chrest. 192). Figure 13 inches long.

This is seemingly another representation of the same species, with the outline a little distorted from the example placed before the artist having been in a more limber state. Hence the profile, instead of rising from the snout in a straight acclivity, is undulated by the comparative depression of the head and swelling out of the nape. Some serratures are shown at the tip of the dorsal spine, and the silvery supra-axillary plate of the humeral chain is notched, as in the figure of *B. cavasius* (Jacquemont, Voy. de l'Inde, pl. 16. f. 2): there are no other perceptible differences of structure. The spots on the base of the caudal are more numerous, but they are fewer and more scattered on the body than in the other figures, and there are

none on the lower fins. The purplish-brown tints are confined to the shoulder, the general colour posteriorly being shining yellowish-brown, with oil-green transverse bars.

Hab. Canton.

PIMELODUS CANTONENSIS, C. et V. xv. p. 142 (8 barbels).

Hab. Fresh waters at Canton.

PIMELODUS ASPER, M'Clelland, Calc. Journ. iv. p. 404. pl. 24. f. 2.

Hab. Chusan.

PIMELODUS TACHISURUS, Lacépède (*Tachisurus chinensis*), v. p. 151. pl. 5. fig. 2; C. et V. xv. p. 163.

Lacépède describes this fish from a Chinese drawing. His figure is not without considerable resemblance in general form to the drawing which we have named *Galeichthys stanneus*, but Mr. Reeves's figure is entirely without blotches such as are represented by Lacépède.

Hab. China.

PIMELODUS MONG, Richardson. *Icon.* Reeves, β . 20; Hardw. Malac. 173.

Chinese name, *Mäng tze*, "Grain or barley-awn fish" (Reeves, Birch); *Mong tsai* (Bridgem. Chrest. 195).

In outline and the relative size and shape of the fins, this drawing has some resemblance to the *Arius pumilus* of Jacquemont (Voy. dans l'Inde, pl. 18. f. 1), but it wants the casque and the crutch-like interspinous process of that fish, there being merely a few black dots on the nape, probably intended to represent some roughness of that part. There are no nasal barbels. The maxillary ones reach beyond the head, and the submandibular ones are shorter. The upper half of the dorsal spine is serrated in front and behind; and the pectoral one only behind. The anal is small and rectangular. The adipose fin also rectangular, and of medium size. The caudal acutely forked. The fish is drawn curved, and the lateral line, which is marked by a silvery stripe, has a corresponding curvature, but is evidently quite straight when the fish is in a true position. The back of the fish is bluish or greenish-gray, the other parts being more or less brightly silvery. The fins have a similar tint to the back, and there is a small black mark on the edge of the adipose fin. Length of the drawing $5\frac{1}{2}$ inches.

Hab. Canton.

PIMELODUS? FULVI-DRACO, Richardson. *Icon.* Reeves, 155; Hardw.

Malac. 174 (et 175 dupl.). Chinese name, *Hwang lung*, "Yellow-dragon" (Birch, Reeves); *Wong lung* (Bridgem. Chrest. 199). Length of the figure $5\frac{1}{4}$ inches.

The profile of this fish, the form of the head and operculum, and the unusual distribution of the dark patches of colour, remind one of the *Pimelodus bagarius* of Buchanan Hamilton, but it wants the prolongations of the dorsal, pectorals and caudal, which characterise that species, and also the enlargement of the maxillary barbels. It has likewise much resemblance to the *P. viridescens* of the same author, of which fig. 157, Hardw. Malac. is a coloured representation. In pl. 11. f. 56 (Fishes of the Ganges), the engraving has been less accurately executed than in the rest of Buchanan Hamilton's plates, and the three green bars which cross the back are not distinctly shown. In *fulvi-draco* the maxillary barbels are a little longer than the head, while the nasal one is only half that length, being about equal to the four submandibular ones. The dorsal and pectoral spines are both stout, the latter being serrated on both sides, the former only behind. The caudal is forked with thickish lobes. There are two colours in the body, viz. olive-green and sienna-yellow, each forming three vertical bands with a connecting longitudinal stripe low on the sides. Of these the olive-green occupies the greatest space. A dark dingy green stripe runs through each caudal lobe, the rest of the fin being yellowish-brown. The dorsal is also yellowish-brown and the anal a rather lighter yellow, but with a broad green bar in its middle, descending from the horizontal ventral stripe of that colour. The pectorals and ventrals are dark with pale rays. The prevailing tints on the head are yellowish-brown and sienna-yellow, passing into a darker brown above.

Hab. Canton.

PLOTOSUS LINEATUS, C. et V. xv. p. 412. *Plotose Anguille*, Lacépède, v. p. 129, 130. pl. 3. f. 2. *Ingelec*, Russell, 166. *Plotose ikapor*, Lesson, Voy. des Duperrey, pl. 31. f. 3; Krusenstern, pl. 60. f. 12 et 13. *Plotosus anguillaris*, Rüpp. Neue Wirbl. p. 76. *Icon.* Reeves, β . 11; Hardw. Malac.

199. Chinese name, *Yen ting* (Birch); *Gan ting*, "Cottage nail" (Reeves); *Om ting* (Bridgem. Chrest. 197). *Icon. piscium* 24 a pict. Sin. &c.

Hab. Seas of Japan and China, Macao, Philippines, Amboyna, Celebes, Western Australia, Friendly Isles, Indian Ocean, Mauritius, Seychelles and Red sea. Chinese specimens exist in the museum of the Cambridge Philosophical Institution, the British Museum, the Chinese collection at Hyde Park, Haslar Museum, and very commonly in the Chinese insect-boxes.

CLARIAS PULICARIS, Richardson, Ichth. of Voy. of Sulph. p. 135. pl. 62. f. 5. 6. *Icon.* Reeves, β . 16; Hardw. Malac. 198. Chinese name, *T'ih sa*, "Pond louse" (Birch); *Tang sih*, "Bird-flea" (Reeves); *Tong sat* (Bridgem. Chrest. 198).

Hab. Canton. Spec. Br. Mus. (Reeves).

The *Macropterothe brun* of Lacép. v. pl. 2. f. 2. is probably the above species, and not the *Clarias fuscus* of Sumatra (C. et V. xv. p. 383).

CLARIAS HEXACICINNUS, Lacép. (*Macropteronotus*), v. pp. 84, 88. pl. 2. f. 3. Established on a Chinese painting.

Hab. China.

CLARIAS ABBREVIATUS, C. et V. xv. p. 386.

This species resembles Lacépède's *C. hexacicinnus* in the shortness of its body.

Hab. Canton.

The *Cossyphus ater* of M'Clelland, Calcutta Journ. (iv. p. 405. pl. 24. f. 3), is apparently an injured example of a fish of this genus. The specimen came from China.

Tribus — ?

Fam. CYPRINIDÆ.

As we know the bulk of the Chinese species of this difficult family chiefly from Mr. Reeves's drawings, the Cuvierian generic groups seem to be better adapted for their description than the minuter subdivisions of more recent ichthyologists, depending as many of them do on anatomical characters. I have compared these drawings carefully with General Hardwicke's numerous figures of Indian *Cyprinidæ**, and also with the plates of M'Clelland's paper in the 19th volume of the Asiatic Researches for 1839, and am satisfied that the Chinese species are almost wholly different from those of the peninsula of India. Mrs. Bowdich (now Lee) copied for Baron Cuvier many drawings of Chinese fish, some of which are referred to by M. Valenciennes in the sixteenth and seventeenth volumes of the 'Histoire des Poissons' which treat of the *Cyprinidæ*. Mr. Brown kindly pointed out to me the drawings she traced from in the Banksian Library. They are kept loose in a portfolio, and are entitled in the Catalogue 'Icones piscium 24 a pictore Sinensi Cantoni eleganter pictæ, fol.' Aided by the dimensions of the tracings noted by M. Valenciennes, and his descriptions of the colours, I have been able to identify most of these drawings with the species named by him; but as he quotes more of Mrs. Bowdich's tracings of *Cyprinidæ* than there are originals in this small collection, it is evident that she made copies also of the figures in some other Chinese book or collection of drawings; and M. Valenciennes also mentions several figures of *Cyprinidæ* which he saw in the Banksian Library, but which I have not been able to find.

carpio. (*Cyprini veri vel cirrhati.*)

CYPRINUS ATRO-VIRENS, Richardson. *Icon.* Reeves, 116; Hardw. Malac. 7. Chinese name, *H'ih le*, "Black carp" (Reeves, Birch); *Hak li* (Bridgem. Chrest. 15). Length of drawing $11\frac{1}{2}$ inches.

The height of the body is a little more than a third of the length, and the back is elevated in

* There are in all 128 drawings of *Cyprinidæ* in the Hardwickian volumes, of which 65 appear from the references on many of them, and the sameness of the style of others, to have been executed by the artists that were employed by Buchanan Hamilton.

form of a long flat ellipsoidal arch, rounding off and descending considerably at the shoulder, to meet the depressed and scarcely convex profile of the face. The chief spine of the dorsal and also of the anal is strongly serrated posteriorly almost to the base. The barbels at the angle of the mouth are about equal to the rictus in length, and those which spring from the middle of the maxillary are not much shorter, in which respect the drawing differs from that of *nigro-auratus* of Lacépède. Seventeen soft rays are shown in the dorsal and six in the anal, the last one in both being divided to the base*. The discs of the scales have a shining bronze colour, their bases a deep blackish-green. The head is mostly dark blackish-green with some golden reflexions, and the operculum is marked with curved streaks descending from its upper anterior corner. The pectoral and caudal are blackish-green, the dorsal dark hair-brown, and the three under fins have ochraceous rays. The lateral line is slightly deflexed, equidistant from back and belly, and is composed of about twenty-eight scales.

Hab. Canton.

CYPRINUS RUBRO-FUSCUS, Lacépède, v. p. 331. pl. 16. f. 1; C. et V. xvi. p. 74. *Icon.* Reeves, 117; Hardw. Malac. 4. Chinese name, *Tang le*, "Pond carp" (Reeves, Birch); *Tong li* (Bridgem. Chrest. 14). Length of figure 11.1 inch.

It is with the doubt which pervades all such approximations that we refer Mr. Reeves's drawing, above-quoted, to the species noticed by Lacépède. In general form it approaches that of Reeves, 116 (*atro-virens*), but the outline of the back is rather less flat, and slopes moderately each way to an apex at the beginning of the dorsal. The height is contained thrice and one-sixth in the total length, of which the head makes a fourth. The rays shown by the artist are D. 2|20; A. 2|5; the strong spines being deeply serrated, and the last soft rays divided to the base. The dorsal commences over the tip of the pectorals and front of the ventrals, and terminates a little farther from the caudal than the anal does. The lateral line is straight, and is composed of twenty-eight or thirty scales. The scales generally are brightly silvery with olive-green bases, which deepen on the back to blackish-green, and fade lower on the sides to apple-green and oil-green. There is a slight reddish blush on the shoulder, and an ochraceous tint on the breast and lower parts of the head. The operculum is streaked on its upper anterior half. The dorsal is pale ash-gray, with a row in the middle of darker pearl-gray blotches between the rays. The ventrals and anal are also pale with bright red tips, and the caudal is bordered at the end with red, the body of the fin being dark yellowish-gray. The pectoral is blackish-gray.

Hab. Canton.

CYPRINUS FLAMMANS, Richardson. *Icon.* Reeves, 118; Hardw. Malac. 6. Chinese name, *Ho le*, "Fire carp" (Reeves, Birch); *Fo li* (Bridgem. Chrest. 18). Length of drawing $10\frac{1}{4}$ inches.

This drawing represents a fish with the same profile as the preceding one (Reeves, 117), the only differences being a trifling increase in the length of the head, and the dorsal commencing a very little farther back. The barbels are the same, and both this and the two preceding species have a conspicuous, elevated, scoop-shaped border to the posterior nasal orifice. The rays shown in the figure are D. 2|18 or 19; A. 2|5. It is possible that this may be merely the *rubro-fuscus* in its spawning dress. The lateral line is very slightly decurved, and is traced on thirty-one scales. The operculum is striated almost to the edge. The bases of the scales down to a row or two below the lateral line are duck-green, so defined as to produce rows of rectangular spots. The discs of the upper scales and the upper parts of the head have bronze reflexions; the lateral ones are silvery with a reddish blush, and the whole under parts of the head and body are bright orpiment-orange, the colours being most intense on the circumference of the scales. The ventrals and anal are also orange; the pectorals and caudal lake-red, and the dorsal pale chestnut-brown.

Hab. Canton.

CYPRINUS VIRIDI-VIOLACEUS, Lacépède, v. p. 548. pl. 16. f. 3. *Icon.* Reeves, 157; Hardw. Malac. 5. Chinese name, *Lüh le*, "Green carp" (Reeves, Birch); *Luk li* (Bridgem. Chrest. 13). *Rad.* B. 3; D. 2|19; A. 2|5; C. $18\frac{5}{8}$; P. 14; V. 9. (Reev. Spec.)

Mr. Reeves has deposited two specimens in the British Museum, which we refer to his figure, and also, though with less confidence, to Lacépède's *viridi-violaceus*. In profile it differs a little from the preceding species, in the curve of the back passing insensibly into the tail, and

* In most of the drawings the very short anterior spines of the dorsal and anal are omitted. We enumerate only those which are shown by the artist.

in the facial line not being so suddenly depressed at its union with the nape, which is nevertheless gibbous. The height of the body is equal to a third of the total length, of which the head forms one-fourth; excluding the caudal, the head is equal to a third of the length; the thickness amounts to nearly half the height. The barbel which issues from near the middle of the maxillary is very small; that which springs from near its tip is moderately large. The straight or very slightly decurved lateral line is traced on thirty-three scales, and there are ten rows of scales in the height of the body. Their discs are obscurely radiated and roughish. No streaks appear on the gill-cover. The dorsal commences some way before the ventrals and over the posterior third of the pectorals; its third soft ray stands above the front of the ventrals. Its large spine and that of the anal are strongly serrated, and the last soft ray of the two fins is divided to the base.

The general hue of this fish is fully darker than any other one of Mr. Reeves's drawings of the genus, the bases and edges of the scales being blackish-green passing into greenish-black, with bronze discs above the lateral line, the light and dark parts being arranged so as to produce lines corresponding in number with the rows of the scales. The dark bases are continued over the belly, but restricted in size; and the discs of the scales below the lateral line are pale olive-green with very slightly deeper coloured edges. Some crimson and lake tints exist on the belly and under surface of the tail. The top of the head is blackish-green, the cheeks and opercula are rich, dark auricula-purple, bordered by brilliant bronze. Under parts of the head and throat buff-orange. Dorsal ash-gray with a yellowish-gray base. The ventrals and anal are pale with rosaceous tips; the pectorals show faint yellow, purple and red tints, and the dark clove-brown caudal has the ends of the lobes hyacinth-red. Lengths of the specimens 6 and $8\frac{1}{2}$ inches: of the figure $10\frac{3}{4}$ inches.

Hab. Canton.

CYPRINUS HYBISCOIDES, Richardson. *Icon.* Reeves, 156; *Hardw. Malac.* 3. Chinese name, *Foo yung le* (Birch); *Foo yang le*, "Hibiscus-flower carp" (Reeves); *Fu yung li* (Bridgem. *Chrest.* 12). Length of figure 12·2 inches.

This has much the form of *viridi-violaceus*, but is more elegantly shaped at the nape, which is not so gibbous. The barbels are longer and the fins are all very tall, seemingly the effect of monstrous growth. A small specimen apparently of this species, but with a triple caudal, was brought from China by Captain Dawkins. Only one spine, the tall serrated one, is represented by the artist in the dorsal and anal, whose rays are D1|19; A. 1|6 or 7. The colour of the back down to the straight lateral line is the same as in *viridi-violaceus*, but the purple tints are replaced on the side of the head by a shining bronze colour. The sides and belly are silvery, with a greenish-gray shade at the bases of the scales. Dorsal and caudal brownish-red, fading to purplish-red towards the edges; anal and pectorals blood-red, the spine of the former and rays of the latter being light purplish-gray. Anterior half of the ventrals blackish-purple, the posterior half peach-blossom red.

Hab. Canton.

CYPRINUS ACUMINATUS, Richardson. *Icon.* Reeves, 125; *Hardw. Malac.* 2. Chinese name, *Shang hae lä*, "Shang hae lä fish," or the "Shang hai wax-fish" (Birch); "Superior sea-carp" (Reeves); *Sheung hoi lap* (Bridgem. *Chrest.* 17). Length of drawing $9\frac{3}{4}$ inches.

This species has an elevated back, shaped in profile like the roof of a house, with the summit at the commencement of the dorsal, which is over the posterior third of the small pectoral and some way before the ventrals. The posterior slope of the back is the more gradual one, and is entirely occupied by the dorsal. The belly is horizontal, with a short upward slope to the tail which is occupied by the anal. Head small, forming one-fifth of the length of the fish, while the height of the body equals a third of the same length. The nostrils want the valve or erect lip shown in the drawings of the preceding species, and there is a deep groove across the snout a short way before them, and on a line with the front of the preorbital. The tip of the snout is tumid, though not large. The barbels are small, particularly the upper pair. The rays shown in the drawing are D. 2|19; A. 2|5. The spines are strong and coarsely serrated, particularly the anal one.

Top of the head and bases of the scales of the back oil-green. More and more of the discs of the scales become silvery as they approach the lateral line; and they are wholly so lower down, except that a very pale wax-yellow colour marks their bases on the belly. The cheek is bluish-gray; the fins are all more or less tinged with aurora-red, with pale borders. The red is deepest on the caudal, but that fin also has a broad colourless border at the end. The lips are reddish, and the eye, which is large, has a red iris.

Hab. Canton.

1845.

carpo

CYPRINUS NIGRO-AURATUS, Lacépède, v. p. 547. pl. 16. f. 2; C. et V. xvi. p. 73. *Icon.* Reeves, 119; Hardw. Malac. 1. Chinese name, *Hae le*, "Sea-carp" (Reeves, Birch); *Hoi li* (Bridgem. Chrest. 16). Length of the drawing $15\frac{1}{2}$ inches.

If one may judge from the size of the figure, this is the largest true carp that came under Mr. Reeves's observation. Its profile rises very considerably in a bold arch to the dorsal, with a shallow transverse groove before the nostrils and a slight undulation at the nape. The belly is flattish. The height of the body is contained thrice in the total length, and the length of the head four times and a half. The mouth is rather oblique, and the upper jaw goes beyond and somewhat overhangs the lower one. The upper barbels are short*. The lateral line, which is traced on thirty-one scales, is slightly decurved, and descends a little below the middle height, taking a straight course through the middle of the tail after passing [the ventrals. No streaks are shown on the gill-covers. The long, low dorsal commences behind the tip of the pectorals and before the ventrals, and reaches past the middle of the anal. The pectorals and ventrals are small and rounded. The rays shown in the figure are D. 1|21; A. 2|5. The dorsal spine is serrated; but the anal one, which is longer and stronger, is represented as smooth. The colours are not dark, the scales having much silvery lustre: they are shaded at the base with olive-green on the back, and with pale honey-yellow on the lower parts.

M. Valenciennes mentions that he saw two paintings of this species in the library of Sir Joseph Banks, but I have been able to discover only one of these, and it is the only true *Cyprinus* with barbels contained in the collection named 'Icones Piscium 24, &c.' The figure is 10 inches long and $3\frac{1}{2}$ inches high, and its pectoral fin has been omitted. The name of *nigro-auratus* is not characteristic either of this drawing or of Mr. Reeves's, which show much more lively colours than M. Lacépède describes, as M. Valenciennes has remarked. But for the observation of the latter naturalist, who has examined the Chinese drawings on which M. Lacépède's species are founded, I should have been inclined to quote Mr. Reeves's darkest drawing, our *atro-virens*, as corresponding best with the epithet *nigro-auratus*.

Hab. Canton.

carpo

CYPRINUS SCULPONEATUS, Richardson. *Icon.* Reeves, 120; Hardw. Malac. 8. Chinese name, *Keih le* (Birch); "Clog or Wooden-shoe carp" (Reeves); *Kih li* (Bridgem. Chrest. 21). Length of figure $8\frac{3}{4}$ inches.

This species differs from the preceding ones in form, the dorsal being more flatly arched and the belly more prominent, with a considerable upward slope behind to join the trunk of the tail. The height of the body is contained thrice and one-half, and the length of the head four times and a quarter in the whole length. The lateral line, which is considerably decurved, but does not descend beyond the middle height, is traced on twenty-nine scales. The barbels are rather short. The dorsal commences over the first ventral ray, and the greater part of the anal is posterior to its termination. The rays shown in the figure are D. 2|17 or 18; A. 2|5. The spines are serrated and shorter than the soft rays. A valve is shown between the nostrils.

The scales have much silvery lustre, and are almost wholly nacre below the lateral line; but the back is tinted with leek-green, which deepens into blackish-green at the base of the scales and forms spots. The edges of the upper scales are also darker leek-green, and the top of the head is of the same colour. There are carmine tints on the lips and tips of the anal and caudal. The pectoral, dorsal and caudal, are leek-green, the ventrals and anal very pale ochre.

Hab. Canton.

Obs. The seven species noticed above seem all to be true *Cyprini*, allied to the common carp of Europe; and their existence in the Chinese waters shows a marked difference between the ichthyology of that country and of India, which does not appear to possess any member of this group. The *Cyprinus semiplotus* of M'Clelland is indeed introduced among the true carps with barbels in the 'Histoire des Poissons'; but this would appear to be from inadvertence, as the figure in the 'Asiatic Researches' (19. pl. 37. f. 2), and

* On first looking at the figure only the barbels which hang from the corners of the mouth are seen; but on examining more narrowly, we may perceive that the painter has drawn the upper barbels lying close to the maxillary.

Mr. McClelland's character of his genus *Cyprinus* both indicate that it does not possess these appendages; and no serratures are shown on the dorsal or anal spines.

CYPRINUS? FOSSICOLA, Gray (*Mursa*), Cat. Br. Mus. *Icon.* Reeves, a. 40; Hardw. Malac. 11. Chinese name, *Hang le*, "Ditch carp" (Birch); *Kang he*, "Ditch carp" (Reeves). Length of figure 8 inches.

This fish has two moderate-sized barbels issuing from behind the middle of the lip and none from the corner of the mouth, and on that account I should have placed it in the genus *Rohita* of M. Valenciennes, which had previously received the appellation of *Nandina* from Mr. Gray, both authors deriving their generic name from one of Buchanan Hamilton's species. Mr. Reeves's drawing, however, does not indicate that development of the upper lip, nor the fringes that characterise *Rohita*; and it is probably on this account that Mr. Gray, in the analysis that he had commenced of these drawings, bestowed on this one another generic epithet as above quoted. In the uncertainty which exists respecting the true characters of this species, I have preferred noticing it under the general appellation of *Cyprinus*. In the extent of the dorsal it resembles the *Cyprinus nandina* of Buchanan Hamilton, or the *Cirrhinus macronotus* of McClelland, but it differs much from that fish in its profile. The back forms a very flat elliptical curve, and there is a considerable gibbous descent at the shoulder to meet the facial line, which would be a straight slope, were it not that a slight rising of the thin snout gives it a small degree of concavity. The mouth is terminal, and the lower jaw is very little shorter than the upper one. The head is exactly a fourth of the length of the fish, and the height of the body somewhat exceeds a third of the length. The eye is rather small, and is equidistant from the mouth and gill-opening. The nostrils are not drawn with an elevated border. The lateral line is considerably decurved, descending over the ventrals below the middle height, but running through the middle of the tail. It is traced on only twenty-five scales. A few short streaks radiate from the anterior superior corner of the operculum. The dorsal, which is highest anteriorly and has a straight edge, begins before the ventrals, over the last fifth of the pectorals, and approaches almost as near to the caudal as the anal does. Its first two rays are drawn as stout and spinous, standing up stiffly from the others: they are not denticulated. The anterior anal rays are nearly similar. The numbers shown by the artist are D. 2|20; A. 2|5, &c. The scales are mostly silvery, with a pale mountain-green tint towards the base of each. This tint covers more of the disc towards the back, and most of the upper scales are also edged with the same. There is a crimson tint on the top of the head, and a faint blush of the same runs along the side above the lateral line. The lips are carmine, and the pectorals, anal and caudal, are carmine at the base, mixed with buff towards their borders, the extreme edge of the caudal being mountain-green. The dorsal is celandine-green with carmine rays, and the ventrals bluish-gray, also with carmine rays.

Hab. Canton.

(*Cyprini non cirrhati*:—*Cyprinopsis*, Fitzinger; *Carassius*, Nilsson.)

CYPRINUS LINEATUS, C. et V. xvi. p. 96.

Hab. Macao.

CYPRINUS CARASSIOIDES, Gray, Cat. Br. Mus. *Icon.* Reeves, 126; Hardw. Malac. 12. Chinese name, *Keih yu*, "Shoe fish" (Reeves, Birch); *Kik u* (Bridgem. Chrest. 21). Length of figure 9 $\frac{1}{4}$ inches.

This drawing represents a fish having nearly the same profile with *C. acuminatus*, being merely a little higher and wanting the transverse furrow on the snout as well as the barbels. The dorsal, which is high in front with an even edge, begins over the middle of the ventrals and terminates opposite to the middle of the anal. The anal spine is thick and as long as the soft rays; the dorsal one is shorter; both are serrated. The numbers shown are D. 2|18; A. 2|5, &c. Lateral line straight and traced on twenty-eight scales. No streaks on the operculum. The scales are brightly silvery, shaded gradually from their bases with greenish-gray above the lateral line, and with faint sulphur-yellow lower on the sides and belly. The edges of the opercular pieces and of the humeral chain are also sulphur-yellow. The fins have ash-gray edges, and are tinged with aurora-red towards their bases. The dorsal has a soiled hyacinth-red bar along its base, and another more distinct along its middle. The eye-brow is flax-flower blue.

Hab. Canton.

CYPRINUS (CARASSIUS) BURGERI, Temm. et Schl. F. J. Sieb. *Rad.* D. 3|15; A. 3|5; C. 19 $\frac{6}{5}$; P. 17; V. 9. (Spec. Br. Mus.)

The specimen in the British Museum is four inches long, and is named by the authors of the 'Fauna Japonica.' It may possibly be the same with the preceding, which it resembles in outline, but it has fewer dorsal rays. There are thirty-one scales bearing tubes on the lateral line, and twelve rows in the height of the fish. It seems to have been a paler fish than the following species.

Hab. Japan.

CYPRINUS GIBELIOIDES, Cantor, Ann. Nat. Hist. ix. p. 29. *Icon.* Reeves, 123; Hardw. Malac. 10. Chinese name, *Tsih * yu* (Birch); *Tsih u*, "Pattern carp" (Reeves). *Rad.* B. 3; D. 4|17; A. 3|6; C. 18 $\frac{7}{7}$; P. 18; V. 9.

As M. Valenciennes compares *C. langsdorfii* to *gibelio*, it is possible that Dr. Cantor's fish may be the same. Several of Dr. Cantor's specimens have reached the British Museum through the India House, one of them labelled *C. nigrescens*, which was probably merely a provisional name, and changed when Dr. Cantor drew up his paper. In form the fish is regular and rather elegant. Its face is convex, and the shoulder ascends in a gentle arch to the dorsal. The head makes rather less than a fourth part of the length of the whole fish; the height of the body is contained three times and a quarter in the length, and the thickness rather more than seven times, or twice and one-third in the height. The mouth is small, not being cleft as far as the nostrils. The symphysis of the lower jaw rises in the form of a minute obtuse point. The lateral line is straight or very slightly decurved, and is traced on twenty-seven scales. There are thirteen rows of scales in the height: each scale is marked on the disc by streaks radiating from the centre. The dorsal commences over the ventrals and extends back to the middle of the short anal. It has four spines, of which the two anterior ones are very minute: the fourth one is strongly toothed behind, and its flexible tip is also toothed. The same is the case with the third anal spine †. The posterior pair of soft rays in both fins are approximated at the base. The colour on the back is greenish-gray, deepening at the base of the scales to blackish-gray, becoming lighter inferiorly and changing to an ochraceous tint on the breast. The fins are greenish or blackish-gray, of different degrees of intensity, and their edges when folded are blackish. The pectoral and anal fins are red on their fore-edges. The figure is 7 $\frac{1}{4}$ inches long; the smallest specimen only 2 $\frac{1}{2}$ inches.

Hab. Canton. Chusan.

CYPRINUS (CARASSIUS) CUVIERI, Temm. et Schl. F. J. Sieb. *Rad.* D. 3|18; A. 3|5; C. 19 $\frac{6}{5}$; P. 17; A. 9. (Jap. Spec. Br. Mus. length 4 inches.)

This is much like *gibelioides*, and may prove to be the same, in which case Dr. Cantor's name has the priority. It seems rather more slender, and has a shorter and more delicate pectoral.

Hab. Japan.

CYPRINUS LANGSDORFII, C. et V. xvi. p. 99.

The 'Icones Piscium 24 a picture Sinensi,' &c., include three figures which may belong to this species, if they are not referable to the *gibelioides* of Cantor. They have the lobes of the caudal and the sinus between them much more obtuse than those of *gibelioides*, or of Reeves's figure 123, and apparently the large suborbital of *langsdorfii*. Their lengths are 6 inches, 5 $\frac{3}{4}$ and 3 inches respectively.

Hab. Japan.

CYPRINUS THORACATUS, C. et V. xvi. p. 97.

M. Valenciennes refers to this species a Japanese painting of a fish whose Chinese name is *tsi*, but this is a generic appellation apparently equivalent to *Carassius*.

Hab. Mauritius (and Japan?).

CYPRINUS ABBREVIATUS, Richardson. *Icon.* Reeves, 124; Hardw. Malac. 13. Chinese name, *Sih küh tsëih †* (Birch); *Suh kwut sih*, "Contracted bone carp" (Reeves); *Shuk kwat tsik* (Bridgem. Chrest. 20). Length of drawing 7 $\frac{3}{4}$ inches.

* *Tsih* is one of the names of the cuttle fish.

† The teeth of the spines are omitted in the figure.

‡ "The fish which has the power of raising and depressing, or rather puckering its bone."

This species has a short, high body, with a peculiarly short trunk of the tail. The length of the head is contained four times and a sixth in the total length, and the height of the body twice and a half. The profile of the back is very slightly arched, so that it is almost parallel to the straight belly, and the descent to the mouth is mostly from the nape and is pretty steep. There is also a considerable ascent from the breast to the mouth, which is terminal, but with the lower jaw a little longer than the upper one. A small conical eminence is represented on the snout immediately before the nostrils. The eye is rather small and is about twice as far from the gill-opening as from the tip of the snout. The cheek appears from the drawing to be covered by the preorbital, like that of *thoracatus*, and the whole surface of the operculum is streaked. The lateral line is perfectly straight and is traced on twenty-three scales only. The dorsal commences over the front of the ventrals and approaches as near to the caudal as the anal does. The latter fin has the same direction with the caudal, being attached to a vertical inflection of the under profile. The spines of the dorsal and anal are shorter than the soft rays. The figure shows D. 2|18; A. 2|5, &c.

The scales are silvery with bluish- or blackish-gray bases, deeper towards the back, but very pale towards the belly. The top of the head is dark greenish-gray, and the shoulders brownish. The edges of the gill-pieces and the throat are straw-yellow. The fins are greenish-gray with a slightly brownish tinge on the lower part of the dorsal.

Hab. Canton.

CYPRINUS AURATUS, Lin. Bl. 93 et 410; C. et V. xvi. *Icon.* Reeves, 121 and a sheet representing 7 varieties; Hardw. Malac. 9; *Descript. of Animals*, p. 203. f. 213. Chinese name, *Kin tsih* (Birch); *Kan tseih*, "Golden carp" (Reeves); *Kam tsik* (Bridgem. Chrest. 22).

Figure 121 Reeves appears to be the fish in its natural or uncultivated state. Its colours are pure hyacinth-red, with silvery borders to the scales and saffron-yellow edges to the gill-pieces. The pectoral, dorsal and caudal are hyacinth-red with a pale bluish-gray border to the latter. The scaly base of the pectoral is purple and lilac, the rays of the anal are yellow and those of the ventral red. The most brilliant of the cultivated varieties represented in Mr. Reeves's drawings are vermilion and arterial blood-red, picked off with bright gold-yellow. Others have the scales shaded with Berlin- and flax-flower-blue, and are marked with large vermilion patches. One is wholly bronze-coloured, the colour being deepest along the back. All the cultivated varieties have an elevated edge or valve between the nostrils, which is not shown in figure 121, and also the triple caudal: one of them has a double anal; three of them have dorsals but of different sizes, and four of them want the dorsals entirely. One of them has very large eyes, and two or three of them eyes sustained on a telescopic pedestal.

Hab. "The Province of Tche kiang from latitude 27° 12' N. to 31° 10' N." (*Hist. des Poiss.* p. 105.)

Among the 'Icones Piscium 24 a picture Sinensi,' &c., one figure measuring 8½ inches in length and nearly 2 inches in height, and belonging to the group of *Carassius*, has no representative in Mr. Reeves's portfolio. The dorsal and anal are acute, and the caudal very much so; the lateral line straight and a little below the mid-height, and traced on thirty-four scales. Colour mountain-green, with metallic lustre on the back, replaced below the middle of the sides by a silvery tint. Upper fins coloured like the back, lower ones pale. M. Valenciennes, at p. 101 of the 16th volume of the 'Histoire des Poissons,' mentions two drawings in the Banksian library, one of which may be the figure here noticed, and the other perhaps one of the three paintings which we have alluded to above under the head of *Cyprinus langsdorffii*.

CAPOËTA RHOMBEA, Temm. et Schl. F. J. Sieb. *Rad.* D. 14; A. 12; C. 19 $\frac{2}{7}$; P. 17; V. 8. (*Spec. Brit. Mus.* 3¼ inches long.)

Lateral line straight a little below the middle, traced on thirty-nine scales: ten rows of scales on the height of the body. First two rays of dorsal and anal jointed, but incumbent on the base of the third one.

Hab. Japan.

CAPOËTA LIMBATA, Temm. et Schl. F. J. Sieb. *Rad.* D. 10; A. 12; C. 19 $\frac{7}{8}$; P. 13; V. 8. (*Spec. Brit. Mus.*)

Lateral line decurved in the middle to the lower third of the height and traced on thirty-three or thirty-four scales. The part of the 'Fauna Japonica' relating to this fish and the preceding one is not yet published.

Hab. Japan.

BARBUS DEURATUS, C. et V. xvi. p. 188; *Icon.* Reeves, 154; *Hardw. Malac.* 96. Chinese name, *Kea yu* (Birch); "Excellent *yu*" (Reeves); *Ka u* (Bridgem. Chrest. 6). Length of the drawing $10\frac{1}{2}$ inches.

Colour of the body a rich golden-yellow, faintly reticulated and changing to silver on the belly. Back marked by six or seven large blotches of umber-brown, which are partly confluent behind the dorsal. Head purplish-red and crimson on the upper half, rest whitish. Tip of the gill-flap sap-green. The basal half of the caudal is pale gall-stone yellow: the other fins have yellowish rays, and their membranes more or less deeply shaded by blackish-gray. Front rays of the anal and pectoral and also the axilla of the latter crimson.

Hab. Canton. Cochin China.

ABRAMIS BRAMULA, C. et V. xvi. p. 357, fide figuræ inter *Icon. Piscium* 24 a picture *Sinensi Cantoni pictas*, Bib. Banks; *Icon.* Reeves, 108; *Hardw. Malac.* 16. Chinese name, *Peen yu*, "Side fish" (Birch); *Peen yu*, "Flat fish" (Reeves); *Pin u* (Bridgem. Chrest. 9). Length of drawing 19 inches. Height 6 inches. Length of head $3\frac{1}{2}$ inches. Genus *Rhodeus*? Agassiz.

This species is partly rhomboidal in form, the very strong, round and slightly curved dorsal spine crowning the superior angle. The slope is straight from thence to near the base of the caudal, but anteriorly it is moderately convex to the nape, where the depression or horizontality of the facial line gives a considerable concavity to the profile. The posterior underside of the rhomb is shorter than the upper one and is wholly occupied by the anal. The under angle of the rhomb is wanting, the belly being straight from the anus to the pectoral, where the outline again ascends. The height to the apex of the rhomb is equal to nearly a third of the whole length of the fish. The very obtuse lower jaw is a little shorter than the thickish upper one, yet the mouth is terminal. Eye large, a little above mid-height and much nearer to the end of the snout than to the gill-opening. The triangular dorsal commences behind the ventrals and ends opposite to the anus. Its height is equal to half that of the body and much exceeds that of its base. The rays shown in the drawing are D. 2/6, the strong second spine being a little shorter than the adjoining branched ray, and the last ray divided to the base. A. 1|29: the spine strong. Caudal deeply forked. Lateral line traced on forty-one scales, decidedly below the middle height and very slightly decurved. Scales large, very silvery, and on the back faintly oil-green with a well-defined rectangular or crescentic olive or blackish-green spot on the base of each. From the lateral line downwards these spots are replaced by light pearl-gray shadings. The temples and edges of the gill-plates are buff and saffron-yellow; the top of the head hair-brown; and the end of the nose and centre of the operculum bluish- or greenish-gray. Upper half of the operculum reddish-brown; lower half pale yellow. Dorsal clove-brown with a broad bluish-gray border. Anal greenish-gray at the base and bluish-gray on the border. Caudal blackish-gray with a crimson base. Ventrals pale with bluish-gray rays.

Hab. Canton.

ABRAMIS TERMINALIS, Richardson; *Icon.* Reeves, 80; *Hardw. Malac.* 15. Chinese name, *Peen yu*, "Border fish" (Reeves); *Pin u* (Bridgem. Chrest. 10). Length of drawing 9 inches. Height of body 3. Length of head 1.63 inch. Genus *Rhodeus*?, Agass.

This fish has the rhomboidal form of the preceding species; but the profile of the very small head, instead of being almost horizontal, forms part of the anterior face of the rhomb. The dorsal spine is strong and tall, being equal to two-thirds of the height; but the anal spine is represented as slender. D. 2|7; A. 1|20. Dorsal placed as in the preceding species, its base little exceeding half its height. Caudal deeply forked with very acute lobes. Eye large; snout acute; mouth small. Lips thin, but drawn as if both upper and under one were double. The scales appear to be very delicate and nacre; about fifty-eight are represented as forming the lateral line, which is conspicuously decurved from the middle of the pectoral to the middle of the anal. The scales are shaded with greenish-gray on the back and are pearly on the sides without spots, the resulting general tint being pale. Opercular pieces and eye bordered with oil-green, and there are some reddish tints on the snout and round the gill-opening. The fins yellowish-gray and greenish-gray.

Hab. Canton.

ABRAMIS RHOMBOIDALIS, C. et V. xvii. p. 78 (*Leuciscus*).

M. Valenciennes describes this species from a Chinese painting, and it appears from his

account of it to have much resemblance to one of the preceding two, but it differs from them both in having a gibbous forehead, in the lateral line traversing the body at mid-height and in the greater number of its anal rays.

Hab. China.

LEUCISCUS CHEVANELLA, C. et V. xvii. p. 358.

Hab. China.

LEUCISCUS MOLITRIX, C. et V. xvii. p. 360; *L. hypophthalmus*, Gray, Cat. Br. Mus.; Richardson, Ichth. of Voy. of Sulph. p. 139. pl. 63. f. 1; *Icon. Reeves*, a. 54; Hardw. Malac. 34. Chinese name, *Peen yu*, "Broad fish" (Reeves, Birch). Genus *Aspius*?, Agassiz.

A specimen was presented by Mr. Reeves to the British Museum. Having omitted to describe the colouring in the 'Ichthyology of the Sulphur,' I may here state that in Mr. Reeves's drawing the top of the head is represented of a deep olive-green colour, and that a fainter tint of the same extends along the back, but is glossed with much brassy lustre. Immediately above the lateral line there is a dilute tinge of crimson, and all the under parts are pearl-gray and brightly silvery. The cheeks are silvery. The under lip deep rose-red, and the gill-cover and membrane are washed with the same. The rays of all the fins are more or less brightly crimson, and the membranes, which vary from dark greenish-gray to blackish-gray, are glossed with crimson on the under fins. This tint is richest on the pectorals, and there are also orange colours between the rays of these fins.

Since this fish was figured and described in the 'Ichthyology of the Voyage of the Sulphur' under the specific name given to it by Mr. Gray, I have ascertained by consulting the 'Icones Piscium 24 a pictore Sinensi Cantoni eleganter pictæ,' that it is the *L. molitrix* of M. Valenciennes. The drawing in the work just quoted measures 11 inches.

Hab. Canton.

LEUCISCUS NOBILIS, Gray, Cat. Br. Mus.; Richardson, Ichth. of Voy. of Sulphur, p. 140. pl. 63. f. 3; *Icon. Reeves*, 134; Hardw. Malac. 33. Chinese name, *Tsing yu*, "Eminent fish" (Reeves). Genus *Aspius*, Agassiz.

Mr. Reeves has deposited a specimen of this fish also in the British Museum. The brassy hue of the scales of this and the preceding species draws attention to the names *cupreus* and *æneus* given by M. Valenciennes to two Chinese *Leucisci*, but the few particulars of form which he has recorded do not correspond, and had the drawings he comments upon represented either *hypophthalmus* or *nobilis*, he could not have failed to remark the unusual depression of the eyes into the level of the preoperculum. In fact both extremities of the suborbital chain rise above the level of the eye, as they do also, though in a less degree, in *L. jesella* and some other species.

Hab. Canton.

LEUCISCUS ROSETTA, C. et V. xvi. p. 356. Length of figure $10\frac{1}{2}$ inches, the head one-third of the length.

L. nobilis is the only *Leuciscus* represented by Mr. Reeves's drawings which has so large a head as *rosetta*; and in *nobilis* the head equals the third of the length only when the caudal is excluded. There is no drawing of this species among the 'Icones Piscium 24 a pictore Sinensi,' &c.

Hab. China.

LEUCISCUS RECURVICEPS, Richardson. *Icon. Reeves*, 149; Hardw. Malac. 14. Chinese name, *Yaou king*, "Stiff necked" (Birch); *Keu too*, "Hooked head" (Reeves). Length of figure from mouth 15 inches. Height of body 3.3. Length of head 3. Genus *Aspius*, Agassiz.

This fish is remarkable for the face being inclined upwards by a sudden curvature over the temples like the profile of a pug-dog. The nape rises in a short arc, but the dorsal line is only slightly convex, while the belly is considerably more curved, and the tail behind the anal is slender. The head, excluding the lower jaw, is one-fifth of the length of the fish; and the height of the body is a little more. The drawing represents a convex keel between the ventrals and anus. The cleft of the mouth is vertical, with a curve towards its angle; and the lower jaw, which forms the anterior end of the head, is dilated and apparently naked, like that of *Aspius mento* and *maxillaris*. The large eye is equal in diameter to a fourth part of the length of the head, and is situated one diameter behind the mouth. The lateral line is decurved at its commencement, and makes a sudden short bend downwards under the dorsal, after which it ascends very gently in a straight line till it has passed some way beyond the

anal, and then runs straight for the short remaining space to the caudal. Scales small, there being about sixty-eight rows represented between the gill-opening and caudal. Dorsal having a height in front of twice the length of its base, acute and placed over the middle space between the ventrals and anal. Its second ray is represented as strong, round and curved like that of a *Rhodus*, and the first one as slender, but only a third part shorter. Anus behind the middle, ventrals well forward, and the pectorals triangular and acute. D. 26; last divided to base; A. 31. Caudal forked. The scales have silvery discs, and are shaded at the base with greenish-gray on the back; on the upper part of the sides with very pale buff or ochre-yellow; and below the lateral line with pearl-gray, the whole being very bright, except on the summit of the back, where the gray spreads over the entire discs of the scales. Dorsal the colour of the back, with a brownish tint on the rays. Pectoral, ventrals and anal colourless on the outer halves, and yellowish-brown at the base. In the anal the brown is confined to the fore part of the fin. The caudal is tinged with darker yellowish-brown at the base, and is bluish-gray on the posterior half.

Hab. Canton.

LEUCISCUS MOLITORELLA, C. et V. xvii. p. 359; *Icon.* Reeves, 110; *Hardw. Malac.* 22. Chinese name, *Too ling**, "Land carp" (Birch); "Ground carp" (Reeves); *To ling* (Bridgem. Chrest. 33). Length of drawing $13\frac{1}{2}$ inches. Height of body 3.1 inches. Length of head 2.15. Genus *Aspius*?, Agassiz.

This drawing has all the characters recorded by M. Valenciennes of *molitorella*, except that the caudal has longer and more pointed lobes than other *Leucisci* represented in Mr. Reeves's drawings, while this fin is said in the *molitorella* to have the lobes rounded and little lengthened. I have not however thought it advisable to keep it distinct merely because of this discrepancy. In the drawing the snout projects beyond the mouth, which is small, with the lower jaw shutting close up. Its dorsal is large, triangular, and as high in front as the body, with a base nearly as long as its height. The ventrals are attached beneath its middle. The anal is nearer to the caudal than to the ventrals. The rays are D. 12 or 13; A. 7.

The summit of the back is olive-green, with a quadrangular spot at the base of each scale of dark duck-green approaching to blackish-green. These spots disappear above the lateral line, which is nearly straight, and give place to a pale shading of bluish-green, which is replaced on the belly by cream-yellow, the discs of the scales being mostly silvery. About twelve of the scales immediately above the pectoral fin are bordered with china-blue, their discs remaining silvery, and thus producing a reticulated rhomboidal spot. The dorsal, ventrals and anal are very pale mountain-green and transparent; the first being oil-green at the base, and the two latter tipped with peach-blossom red. The caudal has greenish rays and roseate tints with a bluish-gray edge; and the rays of the pectoral are also greenish with a faintly roseate membrane. The sides of the head are silvery, shaded with green and glossed by some rose-coloured and lilac tints.

Hab. Canton.

LEUCISCUS FINTELLA, C. et V. xvii. p. 356.

Hab. China.

LEUCISCUS HEMISTICTUS, Richardson. *Icon.* Reeves, 133; *Hardw. Malac.* 26. Chinese name, *Tsing yu* (Reeves, Birch). Length of figure $14\frac{1}{2}$ inches.

L. fintella is represented as being thrice as long as it is high; but in the figure of *hemistictus* the height is contained four times and a half in the length, and the head five times. It has a general resemblance to the *Barilius goha* of Buchanan Hamilton, p. 385 (*Hardw. Malac.* 36 and 53; *Opsarius gracilis*, McClelland, 47. f. 1), but it wants the spots on the head, and the dots on the body are blacker and more regular. The profile of *hemistictus* is symmetrically fusiform. The head is a slender cone with a bluntish apex; and the lower jaw, which is shorter than the upper one, is represented as shutting as it were partly within it. The dorsal commences a little before the ventrals, which are attached in the middle of the length, caudal excluded, and the vent terminates the third quarter of the same distance. No streaks on the gill-cover. Scales large, smooth and nacre, thirty-eight in a longitudinal row and eight or nine in height. The lateral line is evenly decurved and runs beneath mid-height till it passes the anal, after which it runs straight in the middle of the tail. Back olive-green with a narrow border of paler oil-green to the posterior edge of each scale, and a well-defined round spot of blackish-green or greenish-black on the base, making six rows in the middle of the

* *Ling* is "a kind of carp," "a fish resembling a carp."

body, all of them above the lateral line, but only four on the trunk of the tail; one of them below the lateral line. The discs of the scales are more silvery on the sides, and beneath the lateral line they are faintly shaded at the base with pearl-gray, and have neither spots nor coloured borders. Head greenish above, glossed with crimson on the snout, temples and operculum, and silvery with yellow shadings beneath. Dorsal yellowish-gray. Pectorals greenish at the base and cream-yellow elsewhere. Anal and ventrals pale cream-yellow with ochraceous rays. Caudal dark blackish-gray. Iris silvery with a patch of opiment-orange.

Hab. Canton.

LEUCISCUS MACHÆRIOIDES, Richardson. *Icon.* Reeves, 111. Hardw. Malac. Chinese name, *Lan taou*, "Rope-knife" (Birch); *Lan tow* (Reeves). Length of figure $7\frac{1}{3}$ inches. Height $1\frac{1}{4}$ inch. Genus *Chela*?, Buch. Ham. *Pelecus*?, Agassiz.

The shading of the drawing seems to indicate that the belly of this fish is acute from the middle of the pectorals to the anus. Its back is very flatly arched, the nearly horizontal face forming part of the curve, which is much inferior in convexity to the belly. The height of the body is about equal to the seventh of the length, of which the head forms less than an eighth part. The scales seem to be small and delicate, and the lateral line descends at its commencement in a short arc to the lower quarter of the height, and then runs horizontally from the last quarter of the anus, where it rises parallel to the curve of the attachment of the anal fin, and again resumes its horizontal direction when it has reached the middle of the tail. The dorsal commences a little behind the front of the ventrals or in the middle of the length, caudal excluded. It is taller than the anal, and equals it in the length of its base. The caudal is forked.

The very silvery scales are shaded at the bases with leek-green on the back and light pearl-gray on the belly. The fins are pale mountain-green, transparent and without spots, except the pectoral, which is asparagus-green with a blackish spot on its inferior angle, near the base. There are some greenish-yellow shadings on the head.

Hab. Canton.

LEUCISCUS ACUTUS, Broussonnet MSS. in *Descript. of Anim.* p. 205. fig. 194 (*Cyprinus*). *Leuc. acutirostris*, Gray, *Cat. Br. Mus.* *Icon.* Reeves, a. 42; Hardw. Malac. 29. Chinese name, *Leen taou* (Birch); *Leen tou*, "Sickle or reaping-knife" (Reeves). Length of figure $7\cdot35$ inches. Height of body $1\cdot85$ inch. Length of head $1\cdot35$ inch.

This figure has considerable resemblance to *L. machærioides*, and the curvature of the lateral line is the same, but it has a straighter back, a more convex belly, higher body, and a longer and lower anal. The head is equally slender, the snout and lower jaw more acute, and the eye larger. The triangular and acute dorsal commences opposite to the axilla of the ventrals. The pectorals are very acute and the anal reaches near to the caudal. The rays shown in Mr. Reeves's figure are D. 8; A. 15. In the 'Descr. of Animals' they are noted as D. 8; A. 14; C. 18; P. 15; V. 8. About thirty-four scales exist in a longitudinal row, and there are ten or eleven rows in the height.

Colour of the back pale and pure wood-brown with seven pale crimson, longitudinal streaks in the whole height, corresponding with the rows of scales. Below the middle height the scales are shaded with pearl-gray. The caudal is pistachio-green, the dorsal, anal and pectorals ash-gray, with a blotch of rich carmine on the base and first ray of the dorsal, and a slight blush of the same on the base of the ventrals, the first anal ray, and all the pectoral rays.

Hab. Canton.

LEUCISCUS IDELLA, C. et V. xvii. p. 362. *Icon.* Reeves, 122; Hardw. Malac. 23. Chinese name, *Hwan yu*, "Hwan fish" (Birch); *Hwan u*, "Strong carp" (Reeves). Length of figure $17\frac{1}{2}$ inches. *Icon.* Piscium a picture Sinensi 24, &c., drawing $14\frac{1}{2}$ inches long. *Rad.* D. 9; A. 9; C. $19\frac{5}{6}$; P. 19; V. 8, *omnes articulati*. (Spec. Br. Mus.) Genus *Aspius*?, Agassiz. An *Idus*?, Heckel.

A specimen deposited in the British Museum by John Reeves, Esq. measures fourteen inches in length. It is fusiform, with a thickish tail and rather acute snout, perfectly well represented by Mr. Reeves's drawing. The stoutish upper jaw projects beyond the lower one, and curves slightly over it, but the rictus of the mouth is not large and does not reach backwards to the nostrils. Operculum finely streaked. The eye is rather above the middle height of the head, and the furrowed preorbital and temporal extremity of the suborbital tubes rise above its level. The maxillary touches the corner of the mouth, but scarcely forms

part of the upper lip. It is semi-lanceolate with a straight fore-edge. The lateral line descends a little at its commencement, and when opposite to the acute tip of the pectoral, takes a straight course along the middle of the height to the tail. It is traced on thirty-six scales, and there are nine rows of scales in the height of the body, of which five are above the lateral line. The dorsal commences a little before the middle of the length, caudal excluded, and its height, which is equal to two-thirds of the height of the body, measures almost twice the length of its base. The last ray being comparatively longer and the corners of the fin rounded, it has not the triangular form of the dorsal of many of the other *Leucisci*. The front of the ventrals is under the middle of the dorsal, and the anal is midway between them and the caudal.

The large discs of the scales, down to a row beneath the lateral line, have an uniform oil-green tint with much lustre, and are surrounded by a defined border of deep duck-green, producing hexagonal reticulations. Lower down, the discs of the scales are silvery, and the meshes that enclose them pass into ochre- and cream-yellows. The base of the pectoral and scales before that fin have a red-lilac tint, and the head corresponds in colour with the body, being green above and ochraceous or cream-coloured below. There is a little blue around the eye and on the upper corner of the operculum. The pectorals are green, with a brownish gloss; the ventrals buff-coloured, and the other fins dark greenish-gray, the rays of the caudal being dark green. In the figure belonging to the collection in the Banksian library quoted by M. Valenciennes, the bases of the scales are darker than the borders, but the drawings are otherwise so much alike as to occasion little doubt of their being representatives of the same species.

Hab. Canton.

LEUCISCUS PICEUS, Richardson. *Icon.* Reeves, 153; Hardw. Malac. 24.

Chinese name, *Hih hwan*, "Black hwan fish" (Birch); *Hih wan*, "Black ——" (Reeves); *Hak wan* (Bridgem. Chrest. 233). Length of the figure $15\frac{1}{2}$ inches. Height of body 3 inches. Length of head $3\frac{1}{2}$ inches.

This fish is elongated like *idella*, but is rather less symmetrical, has even a thicker tail, more obtusely-forked caudal, and more unevenness in the profile of the head and shoulders. The mouth is similarly formed, the eye in the same position, and the fins similar in place and form. The scales are smaller but appear to be equally strong, and the lateral line as distinctly marked by an elevated straight tube on each scale. It runs very nearly straight, or with a slight general decurvature along the middle of the fish. The fins are taller than those of *jesella*, the dorsal being equal in height to the body, and the anal not very much lower. All the fins are obtuse. The operculum and supra-scapulars are furrowed.

General colour pitchy or blackish-brown, deepest on the back, and gradually changing on the belly to bluish-gray. The scales are not enclosed in a dark mesh-work like those of *jesella*, but are darkest on the fore-edge, and grow gradually paler towards their bases. Head blackish-gray above, beneath white. There is a greenish tint on the breast and a tinge of crimson along the edge of the belly. All the fins are blackish-gray, deepening to black towards the edges, and their rays are whitish at the base. There are forty-three scales on the lateral line, and ten or eleven rows in height. The rays shown are D. 9; A. 10, &c.

Hab. Canton.

LEUCISCUS CORENSIS, C. et V. xvii. p. 355.

Hab. Japan. Corea.

LEUCISCUS JESELLA, C. et V. xvii. p. 360.

Hab. Canton.

LEUCISCUS XANTHURUS, Richardson. *Icon.* Reeves, 112; Hardw. Malac. 25.

Chinese name, *Hwang we ling*, "Yellow-tailed carp" (Birch); *Hwang ne ling* (Reeves); *Wong mi ling* (Bridgem. Chrest. 30). Length of figure 11 inches. Height of body nearly 3 inches. Length of head 1.8 inch. Genus *Aspius*?, Agassiz.

This figure represents a fish with an elevated back rising to a point at the beginning of the dorsal. The anterior slope is varied by a moderate gibbosity of the nape, but the posterior one runs in a perfectly straight, obliquely-descending line to the caudal fin. Belly most prominent under the middle of the pectorals, sloping suddenly up to the throat and very gradually to the caudal. Head small. Eye large and low in the cheek. Snout full and apparently fleshy, projecting beyond the lower jaw, which shuts up beneath it. Pectorals small, acute. The dorsal commences in the middle of the distance between the top of the snout and base of the caudal, and its second ray is represented as stout, round, and acute, like that of a *Rhodeus*, the third one being also simple, but more slender and shorter. D. 3[6, last divided to base;

A. 11, &c. The front of the ventrals is rather before the dorsal: the anal is small, the caudal deeply forked with thickish lobes. The lateral line is a little decurved over the pectoral, and then takes a straight course below the middle of the height to the caudal. It is traced on about forty-eight scales, which are consequently rather small, fourteen or fifteen rows are represented in the height,

The colour of the back is pure oil-green, the silvery borders of the scales increasing in breadth on the flanks, the green is confined to a slight tinge on the base of each, and on the belly it is replaced by pearl-gray. Caudal saffron-yellow with a bluish-gray border. The top of the head is coloured like the back, the snout and under jaw are crimson, the temples mountain-green, and the operculum purple. The dorsal is pale buff with the third ray crimson, and there are crimson tints on the bases of the inferior fins; the front of the anal being yellowish-green. All the inferior fins appear to be transparent.

Hab. Canton.

LEUCISCUS BAMBUSA, Richardson, *Ichth. of Voy. of Sulphur*, p. 141. pl. 63. f. 2. *Icon.* Reeves, 286; *Hardw. Malac.* 32. Chinese name, *Chüh nyu yu*, "Bamboo spoilt fish" (Birch). (*An Chela*, Ham. Buch.? *Pelecus*, Agassiz?)

A specimen was presented to the British Museum by John Reeves, Esq. which measures seventeen inches in length. Not having seen Mr. Reeves's drawing of this species until after the publication of the 'Ichthyology of the Voyage of the Sulphur,' the colours of the recent fish were not therein described. They are pale chestnut-brown on the back with silvery discs to the scales, and a gradual passage into greenish-gray on the belly. The jaws, pectorals, lower fins, and under lobe of the caudal are ochre-yellow; the upper lobe of the caudal the same, with a greenish tinge, and the dorsal greenish-blue. There are also some blushes of carmine at the bases of the ventrals and caudal. This *Leuciscus* is remarkable for the size and solidity of the intermaxillaries, and for the conical process which rises from the symphysis of the lower jaw, as well as for its slender form.

Hab. Canton.

LEUCISCUS CURRICULUS, Richardson. *Icon.* Reeves, 141; *Hardw. Malac.* 28. Chinese name, *Hih shih wan*, "Stone-black barrow (Birch)"; "Black-stone carriage" (Reeves); *Hak shik wan* (Bridgem. *Chrest.* 236). *Rad. omnes articulati*; D. 8; A. 9; C. $19\frac{3}{4}$; P. 19; V. 9. (*Spec. Br. Mus. J. R.* Reeves, Esq.) Length $8\frac{1}{4}$ inches. Height of body $1\frac{1}{2}$ inch. Thickness 0.95. Length of head 1.48 inch.

Shape fusiform, with a conical head and narrow snout slightly longer than the lower jaw. The lateral line runs in the middle of the height, and has a gentle decurvature from end to end. It is traced on forty scales, and there are ten or eleven rows in the height. The height slightly surpasses the length of the head, and is contained five times and a half in the total length of the fish. The dorsal, narrow and less in height than the body, commences opposite to the front of the ventrals, which are in the middle of the length, caudal excluded. The pectorals are obtuse and do not reach the ventrals. The anal is short and similar to the dorsal. Caudal forked. Operculum striated.

Colour of the back liver-brown, with greenish glosses and longitudinal streaks of darker brown. Beneath the lateral line the scales have much nacry lustre and a very pale roseate tint. There are some grass-green tints round the eye and on the operculum. The fins are dark olive or blackish-green, with crimson tints on the bases of all except the dorsal.

Hab. Canton.

LEUCISCUS VANDELLA, C. et V. xvii. p. 363. *Icones Piscium* 24 a picture *Sinensi*, &c. (two figures on separate sheets).

Judging from the drawings, this approaches closely to *curriculus*, but its caudal is more forked and the lateral line more bent down and in a different curve.

Hab. Canton.

LEUCISCUS PLENUS, Broussonnet MSS. in *Descript. of Anim.* p. 204. fig. 197 (*Cyprinus*).

This sketch most resembles *L. curriculus* (141 Reeves), but does not quite agree with it. "The head is oblong, somewhat depressed. Body oblong and roundish. Dorsal nearly in the middle. Tail bifid. Ventrals opposite to the posterior ray of the dorsal. Pectorals pointed. Lateral line convex downwards." "D. 8; A. 11; C. 20; P. 14; V. 10." A foot long.

Hab. "Canton river."

LEUCISCUS CUPREUS, C. et V. xvii. p. 361.

Hab. China.

LEUCISCUS HOMOSPILOTUS, Richardson. *Icon.* Reeves, a. 20; Hardw. Malac. 27. Chinese name, *Hung yen seun*, "Red-eyed sprout" (Birch); *Hung lang seun*, "Red-eyed? seun" (Reeves); *Hung ngen sun* (Bridgem. Chrest. 236). Length of figure 10 inches. Height of body 2.2 inches. Length of head 1.9 inch. Genus *Aspius*?, Agassiz. *Alburnus*?, Heckel.

This fish has an elegant, symmetrical fusiform shape, the back rather less arched than the belly, the face nearly straight, and a very slight gibbosity at the nape. The head is slenderly conical with an obtuse snout, projecting a little beyond the lower jaw. The eye is nearly in the centre, between the tip of the snout and the gill-opening, and the nostrils are considerably before it. Dorsal rounded, commencing opposite the front of the ventrals. Anal short, moderately high. Caudal forked. Lateral line equally decurved to near the caudal, descending a little below the middle opposite to the ventrals, and traced on about thirty-five scales. There are nine rows in the height. D. 9; A. 9 or 10, &c.

Colour of the back pure wood-brown, with four or five streaks of the same through the rows of scales. The scales are shaded with pearl or ash-gray below the lateral line. Caudal leek-green. Dorsal, anal and ventrals mountain-green, with crimson tints on the rays. Pectorals crimson and asparagus-green. Upper quarter of the iris orpiment-orange, the rest silvery. There are a few black specks on the commencement of the lateral line, and three short rows of similar ones above it; the middle row being under the dorsal and the two others on the shoulder.

Hab. Canton.

LEUCISCUS ÆNEUS, C. et V. xvii. p. 361.

Hab. China.

LEUCISCUS TEMMINCKII, Temm. et Schl. F. J. Sieb. (unpubl.) *Rad.* D. 9; A. 13; C. $19\frac{7}{9}$; P. 13; V. 9. (Spec. Brit. Mus. 2.4 inches long.)

Lateral line decurved, principally in the pectoral region, to the lower quarter of the height. Forty-two scales in a row. A dark longitudinal stripe on the middle of the side. Lateral line lower than that of *L. homospilatus*, which this fish resembles in profile.

Hab. Japan.

LEUCISCUS PLATYPUS, Temm. et Schl. F. J. Sieb. (unpubl.) *Rad.* D. 9; A. 12; C. $19\frac{7}{9}$; P. 17; V. 9. (Spec. Brit. Mus. 5 inches long.)

Lateral line decurved to lower third of height. Forty-three scales in a row. Rays of the anal curiously compressed.

Hab. Japan.

LEUCISCUS MINOR, Temm. et Schl. F. J. Sieb. (unpubl.) *Rad.* D. 9; A. 11; C. $19\frac{6}{7}$; P. 15; V. 9. (Spec. Brit. Mus. $3\frac{3}{4}$ inches long.)

Lateral line decurved to the lower quarter of the height. Thirty-nine scales in a row.

Hab. Japan.

COBITIS ANGUILLICAUDATUS, Cantor, Ann. Nat. Hist. ix. p. 30. An. 1842; Richardson, Ichth. of Voy. of the Sulph. p. 143. pl. 55. f. 9, 10. *C. pectoralis*, McClelland, Calc. Journ. Nat. Hist. iv. p. 400. pl. 23. f. 3. An. 1844. *C. erythropterus*, Temm. et Schl. F. J. Sieb. *Icon.* Reeves, 278; Hardw. Malac. 118 et 119. dupl.

The British Museum and the India House are in possession of several of Dr. Cantor's specimens, and of a Japanese one named by the authors of the 'Fauna Japonica; five or six were presented by Sir Everard Home, Bart. to the College of Surgeons.

Hab. Canton. Chusan. Yang tze kiang kew.

COBITIS PSAMMISMUS, Richardson. *Icon.* Reeves, 145; Hardw. Malac. 120. Chinese name, *Sha chuy*, "Sand club" (Birch); *Sha Chivy*, "Sand-needle" (Reeves); *Sha chui* (Bridgem. Chrest. 104). Length of drawing $7\frac{1}{2}$ inches.

In this drawing only four barbels are shown, and the ventrals are a little farther forward than in *anguillicaudatus*. The general colour of the body is umber-brown, pretty dark on the back, but paler and with silvery lustre on the sides. The fins are also brown. A considerable number of oblong or roundish black spots are pretty equally scattered over the whole body, and there are more crowded round ones on all the fins except the ventrals.

Hab. Canton.

COBITIS HÆMATOPTERUS, Temm. et Schl. F. J. Sieb. *Rad.* D. 7; A. 5; C. $16\frac{1}{10}$; P. 11; V. 7. (Spec. Br. Mus. $5\frac{1}{4}$ inches long.)

Hab. Japan.

Fam. SCOPELINIDÆ (Müller).

SAURUS NEHEREUS, Buchanan Hamilton (*Osmerus*), Fish of Ganges, p. 209; *Wana motta*, Russell, 171. *Salmo microps* et *Harpodon*, Lesueur, Journ. Ac. Sc. of Phil. v. pl. 3. f. 1, 1 a. *Saurus ophiodon*, Cuv. Règn. Anim. ii. p. 314; Descript. of Anim. p. 192. fig. 160; *Icon.* Reeves, a. 18; *Hardw. Malac.* 207 (et 208, 209, dr. of *Osmerus nehereus* of India). Chinese name, *Kow too*, "A dog vomiting" (Birch); *Kou tza*, "Dogs' guts" (Reeves); *Kau to u* (Bridgem. Chrest. 164). *Rad.* D. 12; A. 15 (vel 13-14); C. $17\frac{7}{7}$; P. 9; V. 9. (Spec. Coll. Surg.)

The British Museum possesses a Canton specimen of this fish, presented by Mr. Reeves, and there are many in the museum of the College of Surgeons, which were sent from Woosung by Capt. Sir Everard Home, Bart., R.N. Mr. Reeves mentions that this is the species which is exported from Bombay in a dried state, and sold in London under the name of "Bombay ducks." In Mr. Reeves's drawing, a long spinous-looking prolongation of the suboperculum is shown, which seems to have originated in some mistake of the artist, as there is no trace of it in the specimen. The skin is naked, except the lateral line, which is protected by moderately-sized tiled scales, which are more crowded posteriorly and run out on the caudal, forming a middle point or lobe which is shorter than the side. The largest specimen we have examined is eleven inches long.

Hab. Sea of China. Indian ocean. Chusan. Woosung. Canton.

SAURUS LEMNISCATUS, Lacépède (*L'Osmere galonné*), v. p. 230. 238. pl. 6. f. 1. *Saurus elegans*, Gray, Cat. Brit. Mus. *Icon.* Reeves, 188; *Hardw. Malac.* 206. Length of drawing 9 inches.

This drawing resembles *Salmo fœtens*, Bl. 384. f. 2, more than any other *Saurus* of which we have seen a figure. It has the same very short obtuse snout, short pectorals, forward ventrals and long anal, but *S. fœtens* has an unspotted body and is an inhabitant of the Atlantic. Lacépède's figure of *lemniscatus* is rude, but his description of the patterns of the markings answers exactly to Mr. Reeves's drawing, though the colours are not the same. His plate and his description are both founded upon a drawing on vellum by Plumier, and it is very probable that in the lapse of time the colours may have undergone considerable change, assuming that they were perfectly correct in the first instance.

In Mr. Reeves's drawing, the ground-colour on the top of the back is lemon-yellow, which is thickly speckled with irregular spots of brownish-red and umber-brown; on the sides the yellow forms about four longitudinal stripes, alternating with purplish-red ones, the latter becoming broader and changing to crimson on the belly. The head is mostly of the purplish-red tint, and there is a black spot on the supra-scapular. The dorsal, ventrals and anal are transparent and faintly crimson, with one yellow bar on the ventrals and two or three on the dorsal. The dorsal is yellowish at the base and blackish-gray on its posterior border. The cheeks and body are scaly, but no scales are shown on the gill-cover.

Hab. Sea of China.

SAURUS VARIEGATUS, Commerson in Lacépède (*Salmoné varié*), v. p. 157-224. pl. 3. f. 1. *Icon.* Reeves, 187; *Hardw. Malac.* 205. Chinese name, *Hwa kow kwän*, "Flower dog stick" (Birch); *Fa kow kwan*, "Painted dog stick" (Reeves). *Rad.* B. 12; D. 13; A. 7, last one divided to the base; P. 15; V. 8. (Spec. Brit. Mus.)

A Chinese specimen was presented to the British Museum by Mr. Reeves. The teeth of the upper jaw are small, unequal in height, and disposed in two rows; the lower jaw ones are longer, hastate, and in three or four rows. The teeth which arm the palatine bones are

cardiform; those on the tongue are very strong. The ground colour of the back is a mottled mixture of greenish-gray and yellow, varied by fifteen or sixteen transverse bars composed of small spots of umber-brown. These bars are irregular on the top of the back, but they descend below the lateral line, and are there more distinct, from the intervening spaces being gamboge-yellow. The belly is brightly silvery. The head is varied by many spots of umber-brown, the jaws being also much spotted. The caudal is pale orange-brown, with about nine transverse bars thickly spotted with umber. The other fins are more or less deeply yellowish-brown with five or six rows of darker spots on the rays, except the pectorals, which do not appear to be spotted.

The *Dentex nebulosus* (Banks and Solander, Parkinson, Icon. 113. Bib. Banks), which frequents the seas of Otaheite, has considerable resemblance to this species.

Hab. Seas of China and the Mauritius.

SAURUS ARGYROPHANES, Richardson. *Icon.* Reeves, β . 15; Hardw. Malac.

Chinese name, *Kin lin chuy*, "Silk-scaled chuy" (Birch); *Kin lin cheuy*, "Silver-scaled cheuy" (Reeves); *Kam lun chui* (Bridgem. Chrest. 165).

Rad. D. 9*; A. 11*; V. 9 (*ex figurá*). Length of figure 10 inches.

This, judging from the drawing, is a more elongated species than the preceding ones, the height of the body scarcely exceeding a seventh of the total length. The eye is moderately large, and is situated over the middle of the cleft of the mouth. The pectorals, which are not large, reach just to the front of the ventrals, and the dorsal commences over the axilla of the latter fins. The caudal is forked as in the preceding two species, without any middle lobe. The lateral line is strongly marked, and one of the most distinctive characters of the fish appears to be the strong contrast between the colours above and below the line, the upper parts being a decided yellowish-brown, darker on the edges of the scales, producing reticulations, and the lower parts bright silvery, the two tints being exactly defined by the lateral line, which is darker than the other parts. The head is mostly coloured like the back. There are no spots either on the body or fins, but the ends of the pectorals and the posterior edge of the caudal are blackish.

Sir Edward Belcher's collection contains a *Saurus* which I should be inclined to refer to the species represented by Mr. Reeves's drawing, but for the greater acuteness of the snout of the specimen. They correspond in colours and position of the fins. In this specimen the height of the body is inferior to its width, and is contained about eight times in the total length. The back is rounded and depressed, and the thickness diminishes gradually from the dorsal fin to the tip of the acute snout, and also in the other direction to the slender tail, which is round near the base of the caudal fin. The jaws are equal. The cleft of the mouth exceeds half the distance from the tip of the snout to the edge of the gill-cover. The centre of the eye is rather behind the middle of the cleft, and the length of the head exceeds a fifth part of the whole length, or more exactly forms a fourth part of the length, caudal excluded. The eyes encroach on the profile and are about a diameter apart, the edges of the orbits being deficient or notched above. The interorbital space is concave. The occiput ends in a serrated edge, which is slightly concave posteriorly, and the supra-scapulars also show a projecting rough edge. The fronts of the ventrals are attached exactly midway between the tip of the snout and the vent. The tips of the pectoral reach just to their first ray, and the commencement of the dorsal is a little behind the axilla of the ventrals. The rays are B. 12-13; D. 10; A. 12; C. 17 $\frac{3}{8}$; P. 13; V. 8. The lateral line is straight and is formed by a series of pores; there are also a number of lines parallel to it, produced by the transparency of the scales, permitting the meeting of the edges of two rows to shine through the discs of the intervening incumbent row. The teeth are slender with lanceolate tips, but none of them appear to be distinctly barbed. In the upper jaw, the tall ones are inclined forwards and are ranged in a widely-set series, with some shorter ones at the base. In the lower jaw there are several graduated rows inclined inwards, the interior row being the tallest. The palatine teeth form card-like plates which approach each other anteriorly in an acute angle, leaving a narrow smooth space on the mesial line. The surface of the tongue is also armed by rows of teeth, but smaller than any of the others we have mentioned. The edges of the branchial arches are rough, with much more minute teeth, very dissimilar to the slender, curved and barbed teeth of the gills of *Harpodon*.

Hab. Most probably the China seas.

MYCTOPHUM BOOPS, Richardson, Ichth. of Voy. of Erebus and Terror, p. 39. pl. 27. f. 6-12.

* The incumbent front ray of these fins is omitted in the figure, and the formula ought to be D. 10; A. 12, &c.

Sir Edward Belcher and Sir James Ross brought home examples of this species, which have been deposited in the British Museum.

Hab. Seas of China (Belcher). New Zealand and Australia (Ross).

ASTRONESTHES NIGRA, Richardson, Ichth. of Voy. of Sulphur, p. 97. pl. 50. f. 1-3.

Sir Edward Belcher obtained two specimens.

Hab. China seas. ?

LEUCOSOMA CHINENSIS, Osbeck (*Albula*), Voy. i. p. 385. *Leucosoma reevesii*, Gray, Zool. Misc. p. 4; *Icon.* Reeves, 144; Hardw. Malac. 212. Chinese name, *Pih fan yu*, "White rice fish" (Birch); *Pih fan yu*, "White fan yu" (Reeves); *Pak fan u* (Bridgem. Chrest. 244); *Pack fanny* (Osbeck). *Rad.* "B. 3;" D. 11; A. 25; C. 19 $\frac{1}{4}$; P. 10; V. 6 vel 7. (Spec. Reev.)

Examples of this fish exist in the British Museum, where they were deposited by Mr. Reeves and General Hardwicke, in the Chinese collection at Hyde Park, and in the Cambridge Philosophical Institution, to which they were presented by the Rev. George Vachell. As Osbeck's generic appellation was in his day generally applied to the *Coregoni*, it is probable that he did not consider this fish as presenting peculiar generic characters, and had no intention of restricting the name of *Albula* to this species; Mr. Gray's expressive one of *Leucosoma* is therefore the proper generic appellation for this very peculiar form: besides, Bloch after Osbeck gave the name of *Albula* to the genus *Butirinus*, and its re-introduction would lead to confusion. It is the "white bait" of the foreign residents at Macao.

Body elongated, roundish anteriorly; compressed and higher at the dorsal, which is far back, the compression increasing in the tail, which is again more slender. A furrow runs along the top of the back to the front of the dorsal and reappears behind that fin. There is likewise a furrow from the ventrals to the anus, and the very low posterior part of the anal stands also in a furrow. The body is scaleless and transparent, so that the muscles, intestines and spinal column can be seen without dissection. Head and jaws very much depressed, presenting a mere edge in profile, but when viewed from above, showing a lanceolate outline much like the bill of a *Tyrannula*. The head appears to be composed chiefly of thin, flexible and diaphanous bone. A fine short mesial ridge exists at the end of the snout, and farther back there is a rhomboidal membranous space, which is perforated by three holes, through each of which a tooth of the lower jaw protrudes when the mouth is closed. The velum of the upper jaw is posterior to this membranous space. The eyes are lateral and encroach both on the upper and under profiles of the head. Two minute nasal orifices are situated a short way before each eye. The jaws are equal and the short cleft of the mouth is nearly horizontal, but with a slight arching in the middle. The maxillary curves over the angle of the mouth, and sending a fine slip in front of the end of the intermaxillary, forms a considerable part of the margin of the upper jaw. About four widely separated, subulate, recurved teeth arm the limb of each intermaxillary; and between the foremost of these canines and the tip of the jaw there are several much smaller ones in a single series. A close pectinated row of short teeth edges the maxillary; and the lateral teeth of the lower jaw are also smaller and more numerous than the upper ones: but in front, a little within the narrow, unarmed tip of the jaw, three strong teeth stand in a triangle and pass through the holes above mentioned. The palatine bones are finely toothed on the edge, but there are no teeth on the vomer, which is not at all prominent. A row of strong recurved teeth runs along the middle of the pointed tongue. The gill-cover is convex and curves in so as to touch its fellow on the under surface of the head; the opening is large and is partly seen on the upper surface of the head. The gill-membrane unites with the isthmus about one-third nearer to the eye than to the tip of the gill-cover. The ventrals are attached rather before the middle of the fish, the first dorsal considerably farther back, and the adipose fin over the hinder part of the anal, which is wholly behind the dorsal. The first stout ventral ray is jointed, but I can perceive no joints in the short anterior ray of the dorsal and anal. The first two rays of the dorsal are graduated and incumbent on the base of the third one, which is the tallest; the three anterior rays of the anal are also imbedded in the base of the fin*. The pectoral is obliquely truncated, and the caudal is acutely notched at the end. On the base of the fin above and below there is a seam-like edge which is supported by fourteen short rays. The gut appears to be a straight tube without convolutions, but I did not ascertain the absence of pyloric cæca. Length 7 $\frac{1}{4}$ inches.

Hab. Canton.

* There is probably some variety in the numbers of the rays as in notes of the specimen belonging to the Cambridge Philosophical Society I find them recorded as D. 14; A. 30. The numbers given above correspond better with the enumeration of Osbeck and Gray.

Fam. SALMONIDÆ.

PTEROGLOSSUS ALTIVELIS, Temm. et Schl. F. J. Sieb.

Two specimens exist in the British Museum labelled as above. They measure 7 inches and $4\frac{1}{4}$ inches respectively.

Hab. Japan.

Fam. CLUPEIDÆ.

CLUPEA ISINGLEENA, Richardson. *Icon.* Reeves, 60; *Hardw. Malac.* 219.

Chinese name, *Tsing lin*, "Blue scale" (Birch); *Tsing lein*, "Blue scale" (Reeves); *Tsing lun* (Bridgem. *Chrest.* 82). *Rad.* B. 5, upper ones broad; D. 15; A. 21, slender; P. ; V. 8. (Spec. Br. Mus.) Length $5\frac{1}{2}$ inches.

John Russell Reeves, Esq. presented a specimen of this fish to the British Museum. It is a short high fish with a rounded back and a very acute belly, which is serrated by sixteen teeth before the ventrals and ten behind them. The height is contained thrice in the length to the base of the caudal, or thrice and three-quarters when that fin is included. The curve of the back is slight, that of the belly very considerable, and attaining its apex under the beginning of the dorsal. The length of the head is one-fifth less than the height of the body. The mouth is small and terminal, and the maxillary, which is oval and obtuse at the lower end, reaches to beneath the middle of the eye; near its articulating head, a portion of the oval is deficient on the upper side only. There are no teeth on the jaws, but the lining of the mouth and the oval disc of the tongue are studded with minute papillæ. There are ten rows of scales in the height of the body and forty in a row. The ventrals are under the fore-third of the rather large dorsal, and all the fins are scaly. The scales of the back are bright grass-green with silvery edges; lower down they are more silvery with pale ultramarine blue shadings. The fins are pale asparagus-green, with a yellow tint on the pectorals, and the head is mostly silvery with green shadings, orange iris and gamboge edges to the gill-pieces. There is a dark honey-yellow spot on the humeral bone.

This fish has more resemblance to the *Kowal* or *Kowarloo* of Russell (186) than to any other figure in his book, but he enumerates the dorsal rays as 18. They may however, on a comparison of specimens, prove to be the same. It is not unlike Bloch's figure (pl. 405) of *Clupea sinensis*, but there are no indications of the black bars on the dorsal and caudal in Mr. Reeves's figure.

Hab. Chinese seas.

CLUPEA NYMPHÆA, Richardson. *Icon.* Reeves, β . 25; *Hardw. Malac.* 222.

Chinese name, *Chang yaou lin*, "Long-waisted scale" (Birch); *Chang yaou lin*, "Long fine waist" (Reeves); *Cherung iu lun* (Bridgem. *Chrest.* 83). *Rad.* B. 6 (*vel* 7?); D. 17; A. 15 (*vel* 16); C. $15\frac{6}{8}$; P. 18; V. 9. (Specimen in the Br. Mus. brought from Canton by Mr. Reeves.)

The head forms a fourth of the length of the fish, caudal excluded, or rather more than a fifth part including that fin. Both back and belly are acute, and the thickness of the body equals half its height. The back rises in a very gentle curve from the snout to the dorsal, and descends still more gently to the caudal. The curve of the belly is more convex from the tip of the lower jaw to the front of the pectorals, but posteriorly it corresponds with that of the back. The end of the under jaw forms the extremity of the head. Eye near the profile. The disc of the maxillary is an oval approaching nearly to a circle, with a short, slender articulating process: its lower end comes under the middle of the eye. The intermaxillary forms the border of the upper jaw, the maxillary merely touching the corner of the small orifice with its rounded shoulder. The centre of the dorsal is a little anterior to the middle of the length, caudal excluded, and the ventrals are attached under the middle of the dorsal. There are forty or forty-one scales in a longitudinal row. The belly is strongly serrated behind the ventrals, but before these fins the points of the keeled scales are more depressed. The pointed scaly process over the pectoral equals the fin in length.

Colour of the back light duck-green with silvery borders to the scales. The sides silvery shaded by faint bluish-green. Head silvery with green shadings and some rich umber tints on the hind-head and humeral bones. Fins asparagus-green with darkish edges to the caudal. The pectorals are wood-brown.

This fish agrees generally with the figure of *Clupanodon sinensis* of Lacépède (v. pl. 11. f. 2. pp. 468, 471), but does not correspond in the numbers of the fin-rays. It may nevertheless be the same; but as the names of *chinensis* and *sinensis* have been too liberally applied

to Chinese fish, and to more than one species in this genus, confusion will be avoided by dropping it in this instance, even were the identity of Mr. Reeves's specimen and Lacépède's more clearly made out than we have been able to do. It is very unlike the *Clupea sinensis* of Bloch, 405.

Hab. Chinese seas.

CLUPEA CÆRULEO-VITTATA, Richardson. *Icon.* Reeves, 59; Hardw. Mal. 223. Chinese name, *Hwang tsih*, "Yellow glossy" (Birch); *Hwang tseih*, "Yellow —" (Reeves); *Wong chak* (Bridgem. Chrest. 84). Length of figure $8\frac{3}{4}$ inches.

This drawing greatly resembles the preceding species in form, and it has even a better title to the epithet of long-waisted. The dorsal curve is similar to that of *nymphæa*, but the ventral one is more gradual anteriorly, its summit being thrown back to the middle of the dorsal. The anal is longer and lower, and the pectoral reaches only one-third of the distance to the ventrals. The rays shown by the artist are D. 17; A. 18 or 19. The scales are as large as those of *nymphæa*, about forty-two being represented in a longitudinal row. No serratures are shown on the belly.

The upper parts are grass-green with a brownish gloss along the top of the back.* The sides are more completely silvery, but a little above the middle the scales are bordered by China-blue producing a stripe, and the silvery parts lower down have a purplish reflexion and some pale blue shadings on the bases of the scales. Some crimson tints occur on the sides of the head. Caudal and ventrals asparagus-green. The other fins yellowish- or greenish-gray.

Hab. Chinese seas. Canton.

CLUPEA FLOSMARIS, Richardson. *Icon.* Reeves, 64; Hardw. Malac. Chinese name, *Hae ho*, "Sea lily" (Birch); *Hae ko*, "Sea river" (Reeves); *Hoi ho* (Bridgem. Chrest. 85). Length of figure 6 inches.

This drawing represents a rather slender fish with the dorsal curve exceeding that of the belly, and having a culminating point at the commencement of the dorsal. Ventrals far back under the posterior part of the dorsal. Anal short, more than the length of its base distant from the caudal, which is much forked with acute lobes. The skin is represented as nacy without distinct scales, but with the fasciculi of the muscles, which meet in chevrons in the middle height shining through. The rays shown by the artist are D. 11; A. 9.

The back is shaded with leek-green; the sides pearly with blue and crimson reflexions. Head silvery with pale green shadings. Pectorals faintly crimsoned: other fins asparagus-green and transparent. An amber-brown streak runs from the upper angle of the gill-opening over the shoulder and disappears gradually under the commencement of the dorsal.

Hab. Chinese seas. Canton.

In the 'Description of Animals,' p. 201, fig. 149, we have a sketch and short notice of a slender Clupeoid fish having a resemblance to *C. flosmaris* in general form. Its length is stated to be four inches, and the numbers of the rays to be as follows: D. 13; A. 19; C. 14; P. 10; V. 9. "The body long, narrow and somewhat compressed. Dorsal fin in the middle of the back. Tail with two acute lobes. Mouth small, curving upwards. Maxillary flat, narrow, pointed and entire." The belly is represented as serrated, and the pointed maxillary as reaching a little past the eye.

Hab. Canton river.

CLUPEA GRACILIS, Temm. et Schl. F. J. Sieb.

A specimen so labelled exists in the British Museum, but it is in bad condition, and I have not been able to identify it with any of the preceding species.

Hab. Japan.

ALOSA REEVESII, Richardson. *Icon.* Reeves, a. 8; Hardw. Malac. 220. Chinese name, *San le* (Reeves, Birch); *Sam lai* (Bridgem. Chrest. 92). *Rad.* D. 17; A. 17; C. $17\frac{6}{8}$; P. 15; V. 8. (Spec. Br. Mus.) Length of fig. 17 inches. Length of spec. 15 inches.

Mr. Reeves deposited a specimen in the British Museum which still retains the original label numbered in reference to his drawing. It has considerable resemblance to the *palasah* of Russell (198), or *Icon.* Hardw. Malac. 214, fig. *indica*, but the pectoral fin is shorter, the coarseness of the scales on the caudal and the numbers of the fin-rays differ, and we therefore keep them distinct. Russell states the rays of *Alosa palasah* to be D. 18; A. 20; V. 9, &c.

In *A. reevesii* the eye is placed considerably below the temporal groove, and the maxillary, which is slender at its head, swells out in the middle into a regular obtuse oval, and reaches

back to the hinder edge of the orbit. Some branching veins exist on the shoulder, but none are visible on the gill-cover. No teeth on the jaws or maxillary. The lateral line cannot be made out. The scales are faintly streaked. Thirty of them compose a longitudinal row, and there are thirteen rows over the ventrals. Thirteen depressed teeth exist on the rim of the belly before the ventrals, and there are fourteen more prominent ones behind these fins. The front of the dorsal is midway between the end of the nose and the base of the caudal.

The colour of the back is dark greenish- and blackish-gray, forming lines corresponding in number with the rows of scales. Sides and belly very silvery with pearl-gray lines. Snout and top of the head gray and dull crimson, with a greenish shade over the eye; rest of the head silvery with lilac reflexions. Pectorals cream-yellow, glossed in the upper border with purplish-gray. The other fins clove-brown.

Hab. Chinese seas.

ALOSA PALASAH, Russell, 198. ? *Icon.* Reeves, β . 51; *Hardw. Malac.* 221. Chinese name, *Sam le* (Reeves, Birch); *Sam lai* (Bridgem. *Chrest.* 183). *Rad.* B. 6; D. 16; A. 18; P. 15; V. 9. (*Spec. Br. Mus.*) Length of spec. 7 inches. The figure measures 12 inches.

This species has, like *A. reevesii*, much resemblance to Russell's figure 198, and as the fin-rays approach pretty nearly to those of the Indian fish in numbers, we have considered them to be the same, but not without doubt, because there is a difference in the size and form of the pectoral, besides other discrepancies. Mr. Reeves's Chinese specimen differs from *A. reevesii* in having a larger head with its profile running more evenly into that of the back, which is moreover acuminate at the beginning of the dorsal. The head forms a fourth part of the whole length of the fish; the height of the body is contained thrice and two-thirds in that length, and the thickness is equal to a third of the height. The back is acute, and the belly much more so, and strongly serrated between the ventrals and anus. The mesial ridge of the cranium commences between the nostrils, and after dilating a little, tapers off again and disappears without reaching the nape. The sides of the cranium slope a little downwards from the mesial ridge. The shoulder is feebly veined, but the gill-covers are smooth.

The maxillary having an oblong-oval form reaches back to the hinder edge of the orbit. The tongue is widely oval with a small keel on its tip, and the symphysis of the lower jaw also rises in a small point. No teeth on the jaws. Forty scales form a longitudinal row, and there are fifteen rows in height. The pectorals are rather larger than those of *A. reevesii*, and reach nearly to the ventrals, which are attached before the middle of the dorsal. The caudal is much forked.

The scales are shaded by pale leek-green on the back, and by pearl-gray on the sides and belly. The snout and shoulder-plates are glossed with red. The pectorals, ventrals and upper half of the dorsal are cream-yellow, the rays of the pectorals being buff-coloured. The lower parts of the dorsal, anal and caudal are ash-gray, the latter fin being tinted with carmine at its base.

Mr. Reeves mentions that this fish is very plentiful in its season, but is very bony; and Russell makes a similar remark respecting the Indian fish, which is known at the tables of the English residents by the name of "sable-fish."

Hab. Seas of China and India.

ILISHA ABNORMIS, Gray, *Cat. Br. Mus.* *Icon.* Reeves, 81; *Hardw. Malac.* 240. Chinese name, *Tsaou pih*, "Dead white" (Birch); *Tso pih*, "White tso" (Reeves); *Tso pak* (Bridgem. *Chrest.* 81). *Rad.* D. 19; A. 48; C. $19\frac{5}{5}$; P. 16. (*Spec. Br. Mus.*) Length of spec. $14\frac{1}{4}$ inches. Length of fig. $15\frac{3}{4}$ inches.

In the 'Règne Animal' (ii. p. 319) Cuvier mentions that the *jangarloo* of Russell, 191, and his *ditchoe*, 192*, may be separated from the herrings on account of the position of the dorsal behind the ventrals and the length of the anal. Mr. Gray has given this group a name evidently taken from the specific appellation of one of Buchanan-Hamilton's *Chupea*.

Mr. Reeves deposited a dried and varnished specimen of *Ilisha abnormis*, numbered in reference to his drawing, in the British Museum. It is a more elongated fish than the *jangarloo*, and consequently much more so than the *ditchoe*. Its profile slopes gently from the nostrils to the shoulder, which is a little gibbous, and then runs horizontally to the dorsal, whence it declines slightly to the caudal. The face has however a marked degree of concavity caused by the intermaxillaries being inclined upwards, which is common to all the known members of the group. The under profile is a long uniform curve, extending from the under

* The *Chupea affinis* (Gray, *Hard. Ill. Ind. Zool.*) is also a member of this group.

jaw to the end of the anal. The short trunk of the tail behind this fin is slender, and the caudal is forked like the tail of a swallow with long tapering lobes, the lower one being considerably the longest. The dorsal terminates just over the anus, and the belly is most prominent opposite to it. The intermaxillaries are short, lie transversely at the end of the snout, and are armed with a single row of very short subulate teeth. The maxillary has a broad disc, whose width exceeds half its length, and whose end reaches to the articulation of the lower jaw. It is shaped like the valve of a wide *Pinna*, and its fore shoulder only enters into the composition of the orifice of the mouth. Its under edge, which lies on the limb of the lower jaw, is toothed. The point of the lower jaw projects beyond the intermaxillaries. Eye large, near the profile. About fifty scales enter into a row extending from the gill-opening to the caudal, and there are fourteen rows in the height. The belly is strongly serrated by fourteen teeth before the ventrals and thirteen behind them. The anal is long and low.

The scales are very silvery and are tinged on the back by brownish purple-red, and lower down by a very pale cream colour. The jaws are siskin-green; there is a purple blotch on the under part of the preorbital and a greenish-gray one over the eye. Fins cream-yellow, the vertical ones having also blackish-gray borders. Seven branchial rays are shown in the figure. Their number cannot be made out in the specimen*.

Hab. Chinese sea.

Icon. Reeves, 67; Hardw. Malac. 240, is a smaller drawing than the figure of *abnormis*, but exhibits no other difference in form than a slightly shorter and less pointed pectoral. The back is shaded with pale leek-green instead of brown, and the purplish tints of the head are more extended, but the prevalence of the silvery lustre is so great that there is no striking difference in the colours of the drawings. Length of the figure 14 inches. Number 241 in Hardwicke's 'Malacopterygii' is a drawing of a species captured at Penang, which has a higher shoulder and smaller ventrals than *abnormis*, but otherwise much resembles it.

CHATOESSUS AQUOSUS, Richardson. *Icon.* Reeves, 63; Hardw. Malac. 230.

Chinese name, *Shwuy hwa*, "Slipping in the water" (Birch); *Shwuy hwǎ*, "Watery bone" (Reeves); *Shui wat* (Bridgem. Chrest. 89). *Rad.* D. 18; A. 23; C. 19 $\frac{5}{8}$; P. 15; V. 8. (Spec. Br. Mus.) Length 7 $\frac{3}{4}$ inches.

Mr. Reeves has deposited in the British Museum a dried specimen of this fish numbered in accordance with his figure. Its form is symmetrical, the curve of the back corresponding with that of the belly. The height of the body is greatest in front of the dorsal and ventrals, which are opposite to each other, and is contained thrice and three-quarters in the total length. The upper jaw projects beyond the lower one, and the intermaxillaries form two-thirds of the upper lip. The maxillaries are oblong, but taper towards their articulating ends. They reach backwards as far as the anterior third of the eye: the articulation of the lower jaw is under the posterior third. The eye has an elliptical iris, placed vertically like that of a feline animal. There are forty-six scales in a longitudinal row, exclusive of three or four smaller ones on the base of the caudal, and thirteen or fourteen rows in the height of the body. The keeled belly is armed by thirteen spinous teeth behind the ventrals, and by about fifteen before them; but the latter are nearly obsolete. The ventrals are rather before the middle of the length, caudal excluded. The upper parts are leek-green with silvery edges to the scales, and the lower parts silvery and pearl-gray, with a crimson blush. Caudal and anal oil-green. Dorsal and ventrals pale oil-green, the former tipped with carmine. Pectorals yellow. There are some blue and carmine tints on the head.

This fish approaches the *Cl. nasus*, Bl. 429, f. 1, in form, but does not agree exactly either with that figure or the *Kome* of Russell, 196, and there is a difference in the numbers of the fin-rays.

Hab. Chinese sea.

CHATOESSUS TRIZA, Linn. Amœn. Acad. Chinens. Lagerstr. No. 30, An. 1754

(*Clupea*). *Icon.* Reeves, 224; Hardw. Malac. 232. Chinese name, *Yen yaou lin*, "Silver-waisted scale" (Birch); *Yen yaou lin*, "Silver-scaled waist" (Reeves). Length of the figure 9 $\frac{1}{2}$ inches.

Mr. Reeves observes that the nose of this fish, when recent, was as transparent as glass, and that he suspects some mistake in the characters of the Chinese name. It is not easy to identify one among several species closely resembling each other with the short account given of *triza* in the 'Amœn. Acad.,' but this figure corresponds most nearly with the characters enumerated by Linnæus. The *C. thrissa* of Osbeck has more rays in the dorsal. In form *triza* approaches the *Cl. thrissa* of Bloch, 404, but the back is more arched and the anal

* Russell enumerates six in his species.

fin lower and considerably longer. The snout is obtuse and shorter than the lower jaw, the profile of the head arched. The ventrals, which are under the middle of the dorsal, are equidistant from the end of the snout and base of the caudal. The point of the acute pectorals passes beyond them and falls but a little short of the anus. None of the other *Chatoessi* represented in Mr. Reeves's portfolio have pectorals of equal length. The truncated end of the maxillary reaches as far as the anterior third of the orbit. The eye is rather large and is some distance from the profile.

The scales are silvery and show towards their bases a mixture of blackish-green, oil-green and honey-yellow, the dark green predominating on the ridge of the back. Below the lateral line blue tints are intermixed with the general silvery lustre, and the honey-yellow forms faint longitudinal streaks corresponding with the rows of scales. There are some bluish and purple tints round the eye, and a rich orange-coloured brown on the occiput and supra-scapular region, which gradually disappears on the shoulder. The caudal is lemon-yellow, with a flesh-coloured tint at the base and blackish-gray posterior edges. The other fins are pale bluish-lilac.

Hab. China sea.

CHATOESSUS CHRYSOPTERUS, Richardson. *Descript. of Animals*, p. 200. fig. 148. *Icon.* Reeves, 61; *Hardw. Malac.* 231. Chinese name, *Hwang yu*, "Yellow fish" (Reeves, Birch); *Wong u hoi* (Bridgem. *Chrest.* 91). Length of figure $9\frac{1}{4}$ inches.

This drawing represents a fish with a higher body than *C. triza*, a more arched back and a shorter anal. The height is equal to exactly a third of the length, including the extreme tips of the acutely-forked caudal. The back is regularly and considerably arched; the belly is still more convex. The ventrals are a little before the middle, caudal excluded, and are attached beneath the fore part of the dorsal. The top of the triangular pectoral falls considerably short of the ventrals. The jaws are equal, the mouth small, and the maxillary reaches only to the front of the eye, which is smaller and higher in the head than that of *Ch. triza*.

The scales are brightly silvery, and are shaded towards the base on the back with dark leek-green. Below the middle they are sparingly shaded with pale bluish-lilac. The top of the head and edges of the gill-pieces are green; there is a prussian blue patch at the temporal groove and some carmine tints on the snout and suboperculum. The fins are gamboge- and lemon-yellow, this colour being most faint on the dorsal and ventrals. The front of the dorsal and bases of the pectorals and ventrals are tinged with carmine.

Hab. Chinese sea.

CHATOESSUS MACULATUS, Gray, *Cat. Br. Mus.* *Icon.* Reeves, 109; *Hardw. Malac.* 233. Chinese name, *Hwang yu*, "Yellow fish" (Birch, Reeves); *Wong u* (Bridgem. *Chrest.* 87). *Rad.* D. 16; A. 28. (*Spec. Camb. Ph. Inst.*) Length of figure $8\frac{1}{4}$ inches.

The Rev. George Vachell obtained a specimen of this fish at Canton and presented it to the Cambridge Philosophical Institution. It is symmetrical in its form, the ventral and dorsal curves being nearly alike, and the height at the front of the dorsal very nearly equal to one-third of the length, caudal included. The ventrals are attached before the middle, caudal excluded, and under the fore-third of the dorsal. The posterior dorsal ray reaches, as in the other species, to the base of the caudal. The belly is strongly serrated by seven teeth before the ventrals and nineteen behind them. A notch in the upper jaw receives the pointed extremity of the lower one, which is scarcely shorter than the snout. The maxillary is rounded at the end and reaches the middle of the eye.

The colour of the back is pale leek-green, which soon passes into pale honey-yellow. Below the middle the yellow gives place to pale lilac. These colours are confined to the base of the scales, which are very silvery, occupying however more and more of the disc as they approach the top of the back. A round black spot exists on the shoulder and is followed on the flanks by five others, which diminish successively in size. The head is varied by yellowish, brownish and crimson tints on a silvery ground. The rays of the pectoral are buff or orpiment-orange, the caudal dull yellow with blackish-gray posterior edges, and the other fins show a very pale bluish-gray tint. The Chinese name is the same as that of *Ch. chrysopterus*, which this species certainly closely resembles in form. The black spots may perhaps disappear in some seasons.

Hab. Chinese seas.

ENGRAULIS COMMERSONIANUS, Lacépède (*Stolephore commersonien*), v.

p. 382. pl. 12. f. 1. Cuv. Règn. An. ii. p. 323. *Clupea vittargentea*, Lacép. v. p. 424, 458, 461, *exclus. syn.* *Clupea nattoo vel nettooli*, Russ. 187. *Atherina australis*, White, Voy. New S. Wales, 196. f. 1. *Rad.* B. 10; D. 16; A. 23; C. 19 $\frac{1}{2}$; P. 13; V. 7. Length of spec. 3 $\frac{3}{4}$ inches.

John Russell Reeves, Esq. presented several examples of this fish to the British Museum. The species is ranged by Cuvier among the Anchovies, whose bellies are not toothed; but the specimens show six teeth before the ventrals as fine as hairs. None exist behind these fins. An adipose substance fills an angle before and behind the eye as in the Mackerels.

Hab. Seas of China, Australia and India.

The *Stolephore japonois* of Lacépède, or the *Atherina japonica* of Houttuyn, Act. Haarl. xx. p. 340, is probably the above species, with the rays of the dorsal imperfectly counted; and it is possible that the fish of which a notice from the 'Description of Animals' follows after *Cl. flosmaris*, p. 303, may also be an Anchovy, though it is not represented as having a projecting nose.

NOTOPTERUS KAPIRAT, Lacép. ii. p. 189, 190. *Gymnotus notoapterus*, Pall. Spic. vi. pl. 6. f. 2. *Clupea synura*, Bl. Schn. p. 426. *Mystus karipat*, Gray, Hardw. Ill. Ind. Zool. pl. 91. f. 2. *Icon.* Hard. Malac. Ined. 246.

Schneider states that he examined two dried examples of this fish, one from India, the other from China. He particularly notices the smallness of the ventrals, so that it could not be the *pengay* of Renard, f. 90, which he saw, as that has long ventrals, nor, as he is silent about spots on the tail, is it so likely to have been the *Mystus chitot* of Pennant, 'View of Hindostan,' t. xi. (*Mystus chitala*, Ham. Buch. p. 236, 382; Gray, Hardw. Ill. Ind. Zool. pl. 91. f. 1).

Hab. Seas of China and India.

COILIA GRAYII, Richardson, Ichth. of Voy. of Sulphur, p. 99. pl. 54. f. 1 & 2. *Clupea mystus*, Osbeck, Voy. ii. p. 25. Engl. tr.; Linn. Amœn. Ac. iv. t. 3. f. 12. *Mystus clupeoides*, Lacép. v. p. 466, 467. *Icon.* Reeves, a. 14; Hardw. Malac. 252. Chinese name, *Fung we*, "Phœnix tail" (Birch); *Fung ne* (Reeves); *Fung mi* (Bridgem. Chrest. 3). *Rad.* B. 10; D. 12; A. 86; C. 20; P. vii. et 10; V. 7. (Spec. Hasl. Mus.) Genus, *Adara*, Temm. et Schl.

A specimen was brought from the Chinese seas by Captain Dawkins, R.N., and presented to the museum at Haslar.

Hab. Chinese seas. Canton.

COILIA PLAYFAIRII, McClelland (*Chaetomus*), Calc. Journ. iv. plate . *Polynemus*, Descript. of Anim. p. 198. fig. 150; *Adara*, Temm. et Schl. *Icon.* Reeves, β . 26; Hardw. Malac. Chinese name, *Matse* (Birch); *Ma-chai* (Reeves). *Rad.* B. 9; D. 12; A. 70 ad 80; C. 20; P. vi. et 11; V. 7. (Spec. Br. Mus.)

Specimens exist in all the collections of Chinese fishes that we have seen. The scales are used in the manufacture of artificial pearls, and the fish is eaten, when pickled, by the Chinese. A Japanese specimen exists in the British Museum and is labelled "Adara" by the authors of the 'Fauna Japonica.' It agrees with *Coilia grayii* in the number of its anal rays, but has the form of *C. playfairii* and the same number of free pectoral rays. Its numbers are D. 12; A. 86; C. 21; P. vi. et 14; V. 7.

Hab. Chinese seas. Chusan. Yang tze kiang. Canton river. Hong Kong. Japan.

THRYSSEA MYSTAX, Bl. Schn. p. 426. t. lxxxiii. (*Clupea*). Cuv. Règn. An. p. 323. *Clupea malabaricus*, Bl. 432; Bl. Schn. p. 425. *Poorawah*, Russell, 189; *Icon.* Reeves, 138; Hardw. Malac. 236. Chinese name, *Tsing kwa* (Reeves). *Rad.* B. 12; D. 13; A. 39; C. 19 $\frac{5}{8}$; P. 13; V. 7. (Spec. Br. Mus.) Length of specimens 7 $\frac{1}{2}$ and 9 inches. Length of figure 9 $\frac{3}{4}$.

Mr. Reeves has deposited a specimen in spirits and also a varnished one in the British Museum. We have not had an opportunity of comparing them with Indian examples, but

we have little doubt but the synonyms we have cited above are correct, as the figures show the characteristic black mark with white veins on the shoulder, and the indistinct stripe along the middle of the anal. Mr. Reeves's drawing however, which agrees with his specimens, shows a slight gibbosity on the hind head, which is not represented in the figures of Bloch and Russell.

The head is acutely ridged from the nape to the end of the snout, the sides sloping down to the lateral ridges. The intermaxillaries are small and lie in the same line with the long, slender acute maxillaries, which are composed of three pieces. These and the lower jaw are set with fine teeth. There is no tongue, and the gills coming forward to the tip of the lower jaw are connected by a narrow ridge-like isthmus, which is rough with minutely villiform teeth. The head is contained nearly six times in the total length; the height of the body somewhat exceeds a fifth of the length, and the thickness is contained twice and a half times in the height. The belly is serrated by thirteen teeth before the ventrals and nine behind them. There are eleven rows of scales in the height of the body, and thirty-eight in a row between the gill-opening and base of the caudal.

The dorsal surface is coloured by dark grass-green, which is mixed with brown on the top of the head; the lower parts are brightly silvery. The black humeral patch is finely veined with white. The dorsal and ventrals are pistachio-green, the former being blackish on the edges and tinged with yellow in front. The anal is yellow in front, the rest of the fin being green, darkening along the middle so as to form a stripe. The caudal is greenish at the base; bright saffron-yellow on the disc, and blackish-green on the edges. The pectoral is also saffron-yellow, and is sparingly mottled with blackish-green.

Hab. Seas of China and India.

MEGALOPS SETIPINNIS, J. R. Forster, *in figurá* Georgio Forster *pict.* 242. Bib. Banks; Richardson, *Ann. Nat. Hist.* x. p. 493. *Clupea thrissoides*, Schn. 424. *cum Cl. cyprinoide*, Bl. 403. *confusá*; *Clupea cyprinoides*, Broussonnet, *Ichth.* (non Blochii); *Kundinga*, Russell, 203? *Icon.* Reeves, 96; Hardw. *Malac.* 234. Chinese name, *Hang tsaou pih*, "Ditch dead white" (Birch); *Hang tso pak* (Reeves, *Bridgem. Chrest.* 88). *Rad.* Br. 21-22; D. 18 vel 19; A. 25; C. 20 $\frac{1}{2}$; P. 15; V. 10. (Spec. Br. Mus.)

We have not seen an Indian or Chinese example of this species, but specimens exist in the British Museum from Port Essington, and have been described at length in the 'Annals and Magazine of Natural History' as above quoted. One anomaly occurs in Mr. Reeves's drawing, the existence of a pointed canine tooth in the upper jaw, whereas in the specimens the edges of the jaws are rough with very narrow bands of minute teeth. The colours in the Chinese painting are also different from those described by Forster, but Broussonnet's figure, as well as George Forster's, correspond exactly in profile and size of fins, shape of head, &c., with Mr. Reeves's drawing. Russell's seems distorted, probably from the flaccidity of the specimen.

The discs of the scales are like frosted silver, and they have a well-defined border of a polished silvery appearance. The scales of the lateral line are forty in number, and they are marked by six or seven radiating, forked furrows. In Mr. Reeves's drawing the bases of the scales on the back are shaded with bluish-lilac, which gradually changes on the sides and belly to celandine-green. The sides of the head are oil- and siskin-green, the occiput being tinged with hyacinth-red. The pectorals are yellow, which is mixed with brown on the upper border; the last ray of the dorsal is sulphur-yellow; the rest of the fins are hair-brown, the fronts of the dorsal and anal being wood-brown. Iris grass-green.

Hab. Seas of China, India, Australia and Polynesia. Brackish lagoons, Port Essington.

MEGALOPS CURTIFILIS, Richardson. *Icon.* Reeves, 136; Hardw. *Malac.* Chinese name, *Ke yu* (Birch); *Ko yu* (Reeves); *Ki u* (*Bridgem. Chrest.* 86). Length of figure 8 inches.

This drawing represents a rather more slender fish than *M. setipinnis*, with a smaller eye, narrower maxillary, fewer scales both longitudinally and vertically, the dorsal commencing farther back over the axilla of the ventrals, and having with the anal fewer rays. The last ray of the dorsal is shorter, and the last anal one more decidedly lengthened than the corresponding rays of *C. setipinnis*. The bright silvery edges of the scales are not so sharply defined and distinguished from the discs, which in this fish are leek-green above the lateral line, and gradually change to pearl-gray towards the belly. The upper parts of the head are dark olive-green. The dorsal and caudal approach to blackish-green, the latter being very dark; the

ventrals and anal are pale and transparent, and the pectoral lemon-yellow. The scales of the lateral line are marked by the same kind of silvery furrows as *M. setipinnis*.

Hab. Chinese seas.

ELOPS MACHNATA, Forskal, No. 100 (*Argentina*). *Synode chinois*, Lacép. v. p. 319. 322. pl. 10. f. 1. *malè*. *Jinagow*, Russell, 179. *Elops machnata*, Richardson, Ichth. of Voy. of Erebus and Terror, p. 59. pl. 36. fig. 3-5. *Icon.* Reeves, 137; Hardw. Malac. . Chinese name, *Chuh keaou*, "Bamboo —" (Reeves).

Mr. Reeves has deposited a specimen from Canton in the British Museum. This fish is totally distinct from the *Mugil salmoneus* of Forster, a figure of which is given in the 'Ichthyology of the Voyage of the Erebus and Terror,' pl. 36. fig. 1, 2.

Hab. Seas of China and India. Red sea.

ELOPS PURPURASCENS, Richardson. *Icon.* Reeves, a. 53; Hardw. Malac. . Chinese name, *Chuh kin*, "Variegated bamboo" (Reeves). Length of figure $10\frac{3}{4}$ inches.

This drawing does not differ very greatly from the preceding one in form, but it represents a fish having a more irregular dorsal outline and less arched, a more convex belly, and the lateral line slightly decurved throughout its whole length. The face is gibbous just before the eye, and there is a less marked convexity at the nape. The summit of the back is grass-green, beneath which a blackish-purple band extends from the nape to the upper lobe of the caudal, terminating rather abruptly about half-way to the lateral line. The rest of the side is brightly silvery with a slight gloss of pearl-gray. The top of the head is grass-green. The edges of the maxillaries and gill-pieces are green and crimson. The dorsal and caudal are leek-green, passing into blackish-green on the rays and edges; the ventrals and anal are pale mountain-green with some yellow; and the pectorals are bright sulphur-yellow sprinkled with a few dark green specks. The cluster of black dots on the cheeks and preopertulum of *E. machnata* are not shown in this figure.

Hab. Chinese seas.

CHIROCENTRUS DORAB, Forskal, No. 108 (*Clupea*). *Clupea dentex*, Bl. Schn. 428. *L'Esoce chirocentre*, Lacép. *Wahlah*, Russell, 199; Descript. of Anim. p. 194. fig. 161, taken at Madras and named by Broussonnet *Esox clupeoides*. *Icon.* Reeves, β . 47; Hardw. Malac. 237, Chinese; Hardw. Malac. 239, Indian. Chinese name, *Poo taou*, "Cloth knife" (Birch); *Poo tou*, "Knife cloth" (Reeves); *Po to* (Bridgem. Chrest. 90). *Rad.* D. 16; A. 34, first two minute; C. $19\frac{1}{11}$; P. 16; V. 7. Length of spec. $10\frac{1}{4}$ inches. Genus, *Chirocentrus*, Cuv. Règn. An.

The British Museum possesses a specimen in spirits from Canton presented by Mr. Reeves, which we have not had an opportunity of comparing with the Indian fish. The drawings of the latter differ a little in the position of the ventrals, but as this may have been owing to inattention, we have not kept the Chinese fish distinct.

The Chinese specimen has a long canine on each small transverse intermaxillary. The strap-shaped maxillary reaches to the middle of the orbit and the articulation of the lower jaw; its edge is armed with small subulate teeth, which become very minute towards its tip. Each limb of the lower jaw is furnished with five or six tall slender teeth inclining backwards, and having a short tooth between each pair. The ventrals are as near as possible in the middle of the length, excluding the whole caudal fin from the bases of its lobes. A long nacy appendage exists in front of the pectoral, and there is another in its axilla; but the rest of the skin is wrinkled and smooth, without scales, and resembling fine tinfoil in its lustre. The teeth on the edge of the belly, shown in Mr. Reeves's figure, are not formed by pungent scales, but by the points of the ribs. The belly is acute, like a knife, from the gills to the anal. The cheek is soft and nacy, and the skin of the temples is striated. The head has a scomberoid aspect above and its lateral ridges are smooth.

The colour of the back is pistachio-green, the rest of the fish brightly silvery with purplish reflexions, and the courses of the muscles are shown by oblique lines meeting in the middle height. Fins yellowish-gray, the edges of the caudal shaded with blackish-gray.

Hab. Seas of India and China.

Tribus APODES.

Fam. ANGUILLIDÆ.

ANGUILLA AVISOTIS, Richardson, Ichth. of Voy. of Sulphur, p. 104. pl. 51. f. 1. *Icon.* Reeves, 222; Hardw. Malac. 288. Chinese name, *Woo urh shen*, "Crow-ear eel" (Birch); *Woo urh shen*, "Black-eared eel" (Reeves).

Hab. Canton.

ANGUILLA CLATHRATA, Richardson, Ichth. of Voy. of Sulphur, p. 104.

A specimen from Canton exists in the Cambridge Philosophical Institution, to which it was presented by the Rev. George Vachell.

Hab. Canton.

ANGUILLA SINENSIS, M'Clelland, Calcutta Journ. Nat. Hist. iv. p. 406. pl. 25. f. 2. and No. 18. p. 208. July 1844.

Hab. Chusan. The British Museum possesses a specimen of Dr. Cantor's.

ANGUILLA MACROPTERA, M'Clelland, l. c. p. 407. pl. 25. f. 1. et No. 18. p. 208.

Hab. Chusan.

CONGRUS TRICUSPIDATUS, M'Clelland (*Murænesox*), Calc. Jour. N. Hist. iv. p. 408. t. 24. f. 1. and No. 18. p. 210. Richardson, Ichth. of Sulph. p. 105. pl. 51. f. 2. *Icon.* Reeves, a. 41; Hardw. Malac. 295. Chinese name, *Ho shen*, "Stork eel" (Birch); "Hook-billed eel" (Reeves).

Specimens collected by the Rev. George Vachell and Sir Everard Home exist in the museums of the Cambridge Philosophical Society and College of Surgeons.

Hab. Chusan. Ningpo. Canton.

CONGRUS LEPTURUS, Richardson, Ichth. of Sulph. Voy. p. 106. pl. 56. f. 1-6.

Hab. Canton.

CONGRUS FASCIATUS, Gray, Cat. Br. Mus. *Icon.* Reeves, 284; Hardw. Malac. 291 et 293. dupl.

In this Conger the vent is a little before the middle of the fish, and the dorsal fin commences over the centre of the ventrals. There is a pair of tubular nostrils or cirrhi on each side of the snout, and a pair of small holes or pores on each side of the mesial line in the interorbital space. The ground colour is ochre-yellow with irregular purplish-black blotches on the dorsal and back, and descending to the middle of the sides. Several of these blotches or bars enclose spots of the ground colour. The top of the head is purplish-black, and three dark spots are placed in a triangular position on the hind head. The cheeks, under part of the head and the anal have the bright ochraceous ground tint, the edge of the latter being dark. The dorsal and ventrals are mountain-green, the blotches on the former forming part of the bars which cross the back. The breadth of the head is equal to half its length, which is an eighth part of the whole length of the fish. Snout rather obtuse, gill-openings lateral. The rays of the caudal fin are shown at the tip of the tail, otherwise this might have been taken for an *Ophisurus*, which it resembles in its banded markings.

Hab. Chinese sea.

OPHISURUS DICELLURUS, Richardson, Ichth. of Voy. of Sulph. p. 106. pl. 48. f. 2-4.

Sir Everard Home presented a specimen to the College of Surgeons.

Hab. Mouth of the river Yang tze keang.

OPHISURUS COLUBRINUS, Linn. Gmel. (*Muræna*), Boddart apud Pall. Beytr. ii. p. 56. t. 2. f. 3; Cuv. Règn. An. ii. p. 351. *La murænophis colubrine*, Lacép. v. p. 641. pl. 19. f. 1. *Muræna annulata*, Thunberg,

Spec. Ichth. viii. pl. 1. f. 1. *Gymnothorax annulatus*, Bl. Schn. p. 527.
Ophithorax colubrinus, M'Clelland, Calc. Journ. Nat. Hist. No. 18. p. 212.
 July 1844.

Hab. Sea of Japan.

OPHISURUS SPADICEUS, Richardson.

A specimen of this fish was presented to the British Museum by John Reeves, Esq. The snout, though not wide, has a truncated tip, and the distance between its extremity and the anus is to the length of the fish, as 0.43 to 1.0. Three teeth stand in a triangle at the extremity of the upper jaw, and behind them, the jaw teeth, consisting of a single row on each side, meet in an angle on the symphysis, within which there are five or six small teeth on the mesial line. The lower jaw is armed like the upper one with a single series on each limb, but there are none anterior to the point at which these side lines meet. The tip of the jaw is rounded and considerably shorter than the upper one. Nostrils very minute, with an orifice over the eye near its middle, having slightly raised edges, and another terminating a short thickish tube on each side of the snout, and there are two minute lobules on the edge of the upper lip, the posterior one situated beneath the eye, and the other half-way between it and the end of the snout. The throat forms a slightly plaited bag, and the gill-openings are before the lanceolate acute pectorals and a little lower. The pectorals contain eleven rays; the dorsal commences immediately behind them, and like the anal, which is highest anteriorly, terminates suddenly so as to leave a very short naked tip of the tail. The rays of the fins are pretty conspicuous.

The colour of the specimen, after maceration in spirits, is darkish wood-brown above the lateral line, and whitish beneath, without any defined spotting. Length $13\frac{1}{2}$ inches. Distance between tip of snout and anus, 5.8 inches: length of the pectoral, 0.55 inch; and height of the body, 0.4 inch. This species possesses some of the characters ascribed to *Oph. rostratus* of M'Clelland, but as he knows it merely from a drawing of Buchanan-Hamilton's, and consequently has not said anything of the dentition, we cannot compare them. It is different from those which he has figured in the Calcutta Journal, and also from *Oph. boro* (Ham. Buch.), which has two rows of blunt teeth on the jaws and mesial line of palate, with three in a triangle at the tip of the upper jaw.

Hab. Canton.

OPHISURUS HARANCHA, Buchanan-Hamilton, Ganges, p. 20? M'Clelland, Calc. Journ. v. p. 211. pl. 12. f. 4.? *Icon.* Hardw. Malac. 302.? Gray, Hardw. Ill. Ind. Zool. 95. f. 2.

The British Museum possesses a specimen of the *harancha*, which was presented to General Hardwicke by Buchanan-Hamilton, and also a Chinese *Ophisurus* procured at Canton by Mr. Reeves, which differ from each other so slightly that I hesitate to name them as distinct until more recent specimens have been compared. We have had no assistance in the discrimination of these two specimens either from colour or anatomical structure.

The body of the Chinese fish is nearly cylindrical, and the fish tapers only in the compressed end of the tail. It seems to have rather a smaller head than the Indian specimen and a shorter cleft of the mouth, and exhibits a row of prominent pores on the lateral line, which are not evident in the latter. Both have pores along the upper lip, round the eye and on the snout. The fins in both are pale, and their origins and terminations easily made out. The dorsal commences farther back than the tip of the pectorals, and almost meets the anal at the end of the tail, but the extreme tip of the tail is naked. Teeth stoutly subulate and short in two rows on the fore part of both jaws, but wider apart in the lower jaw: in one row on the limbs of the jaws. Three or four near the symphysis of the upper jaw are a little taller than the rest. They stand in two rows on the fore part of the mesial line of the palate, and in only one row posteriorly.

The Chinese specimen, after a long continuance in spirits, has a dilute wood-brown colour, and when examined through a lens, appears to be mottled with whitish specks mixed with a smaller number of black ones. The whitish specks exist on the belly, but the black ones are wanting there, hence the resulting tint is lighter. The Chinese specimen in the Br. Mus. is nearly 12 inches long; one in the Cambridge Philosophical Institution measures $14\frac{1}{4}$ inches, and the Indian one is $17\frac{3}{4}$ inches.

Hab. Canton. India.

OBS. *Ophisurus boro* (Ham. Buch.; Gray, Hardw. Ill. pl. 95. f. 1. *Icon.* Hardw. Malac. 301), of which there is an authenticated Indian specimen in the British Museum, bequeathed to it by General Hardwicke, has two or three rows of flat round teeth on the jaws and middle line of the palate, with three teeth of the same form placed in a triangle at the tip of the upper jaw. The dorsal commences farther forward than that of *harancha*. The same museum

possesses also a specimen of *Ophisurus hijala*, Buch. Ham. *Icon. Hardw. Mal.* 300, noted as having been taken in a salt-water lake.

OPHISURUS? *VIMINEUS*, Richardson, *Ichth. of Voy. of Sulph.* p. 107. pl. 52. f. 16-20.

This *Ophisurus* differs much from the blunt-toothed species and resembles the *Sphagebranchi* in its acute, elongated snout. Another species of an orange colour and slightly speckled on the back inhabits the Sooloo archipelago on the north side of Borneo. A drawing of it, made by Assistant-Surgeon Arthur Adams of the Samarang, exists in the British Museum.

Hab. China. Specimen in Sir Edward Belcher's collection.

Fam. *MURÆNIDÆ*, M'Clelland.

MURÆNA *ISINGLEENA*, Richardson, *Ichth. Voy. of Sulphur*, p. 108. pl. 48. f. 1. *Icon.* Reeves, 237; *Hardw. Mal.* 305. Chinese name, *Tsing teen chuy*, "Blue spotted club" (Birch); *Ching teem chuy*, "Blue spotted muræna" (Reeves). Genus, *Muræna*, Thunberg; *Gymnothorax*, Bloch. *Cuv. Règ. An.* ii. p. 351. *Div.* 1. *dentibus uno ordine.*

Hab. Canton. Mr. Reeves has deposited two specimens in the British Museum.

MURÆNA —? Temm. et Schl. (*Murænophis*).

A specimen labelled thus exists in the British Museum. It is 22 inches long, is finely mottled and clouded, and has a single row of sharp subulate teeth on the jaws.

Hab. Japan.

MURÆNA *VARIEGATA*, Temm. et Schl. (*Murænophis*).

A *Muræna*, so named by the authors of the 'Fauna Japonica,' exists in the British Museum. It much resembles *M. thyrsoides*, but differs in its dentition, viz. in having a single row of conical, compressed and very acute teeth on each jaw, and two rows of minute ones on the roof of the mouth. The specimen is 18 inches long.

Hab. Japan.

MURÆNA *REEVESII*, Richardson, *Ichth. of Voy. of Sulph.* p. 109. pl. 48. f. 2. *Icon.* Reeves, 68; *Hardw.* 304. Chinese name, *Lä chuy*, "Wax club" (Birch); *La chuey*, "Waxen eel" (Reeves). (*Div. incerta.*)

Hab. Canton. No specimen.

MURÆNA *THYRSOIDEA*, Richardson, *Ichth. of Voy. of Sulph.* p. 111. pl. 49. f. 1. *Icon.* Reeves, 220; *Hardw.* 304. Lower figure. Chinese name, *Hwa chuy*, "Flowery club" (Birch); *Ta chuy*, "Flowered chuy" (Reeves). Genus, *Strophidon*, M'Clelland.

The British Museum possesses two of Mr. Reeves's specimens.

Hab. Canton.

Obs. *Muræna tessellata*, *Ichth. of Sulph.* p. 109. pl. 55. f. 5-8, being part of Sir Edward Belcher's collection, and *M. pavonina*, *ibid.* p. 110. pl. 53. f. 1-6, may be inhabitants of the Chinese seas, but the place of their capture was not recorded.

MURÆNA *CERINO-NIGRA*, *Icon.* Reeves, *nullo numero, non Hardw.* Length of drawing $7\frac{3}{4}$ inches. *Div. incerta.*

This drawing apparently represents a *Muræna* with very low fins. The general colour is a light wax-yellow with greenish tints and many blackish spots. A row of larger, round and nearly equidistant spots runs along the middle of the body, and on the top of the back and margins of the tail the spots assume the form of very short oblique bars. The throat and belly are tinged with carmine. Upper jaw obtuse and projecting slightly beyond the lower one. Nostrils not represented as tubular.

Hab. Canton.

Fam. *SPHAGEBRANCHIDÆ*, Müller.

MORINGUA *LUMBRICOIDEA*, Richardson, *Ichth. of Voy. of Sulph.* p. 113. pl. 56. f. 7-11. Genus, *Moringua*, Gray, *Zool. Misc.* p. 9.

Hab. China. Specimen in Sir Edward Belcher's collection 10 inches long.

MORINGUA —? Temm. et Schl.

The British Museum possesses a Japanese *Moringua* of which we do not know the specific name, as the lable originally attached to it had been transposed before it was purchased by the museum. It differs from *M. lumbricoidea* in its more slender, elongated body, narrower fins and longer under-jaw. The rays are perceptible round the end of the tail only, the rest being concealed by the thickness of the membrane. The teeth are similar to those of *lumbricoidea*. Though the specimen is $2\frac{1}{2}$ inches long, it is no thicker than a *lumbricoidea* only ten inches in length. The genus seems to be the same with *Ptyobranchus* of J. M'Clelland, but his Indian species all differ in the shape of the fins.

Hab. Japan.

ICHTHYOPHIS VITTATUS, Richardson, Ichth. of Voy. of Sulphur, p. 114. pl. 53. f. 7, 9. Genus, *Ichthyophis*, Lesson.

We are ignorant of the internal structure of this fish, but from the posterior position of the anus it is probably to be referred to the *Sphagebranchidæ* of Müller (*Ophicardides*, M'Clelland). A stuffed skin exists in the Haslar Museum, which was brought from China by Commissioner Elliot.

Hab. China.

APTERICHTHYS QUADRATUS, Richardson, Ichth. of Voy. of Sulphur, p. 115. pl. 52. f. 8-15 (*Sphagebranchus*). Genus, *Apterichthys*, Dumeril; *Cecilia*, Lacép. Cuv. Règn. An. ii. p. 353.

Hab. China. Specimen in Sir Edward Belcher's collection.

AMPHIPNOUS CINEREUS, M'Clelland (*Pneumabranchnus*), Calc. Journ. Nat. Hist. iv. p. 411. pl. 25. f. 3. Genus, *Amphipnous*, Müller, Archiv. p. 15, 1840.

Hab. China. Chusan. Ning poo.

MONOPTERUS LÆVIS, Lacépède (*Unibranchapertura*), v. p. 658. Richardson, Ichth. of Voy. of Sulphur, p. 116. *Monoptere javanais*, Lacép. p. ?

A specimen obtained at Hong Kong by R. A. Bankier, Esq. was presented by him to the museum at Haslar Hospital.

Hab. China. Hong Kong. Malay archipelago ?

MONOPTERUS CINEREUS, Richardson, Ichth. of Voy. of Sulphur, p. 117. pl. 52. f. 1-6. *synon. exclus.*

On consulting Mr. M'Clelland's paper in the 18th number of the Calcutta Journal, I find that, misled by the close similarity of the outline of *Pneumabranchnus cinereus* in the fourth volume of the above-mentioned journal to that of this Chinese fish, I erred in considering them to be the same species. This fish has a naked skin, while the bodies of his *Pneumabranchni* (*Amphipnous*, Müller, 1840) are covered with imbricated scales.

Hab. China. Chusan. Woosung.

MONOPTERUS MARMORATUS, Temm. et Schl. (*Unibranchapertura*).

The British Museum possesses an example of this species which was procured by Dr. Cantor at Chusan. It is $17\frac{1}{4}$ inches long, the part behind the anus measuring 3.45, and being consequently proportionally a little shorter than the tail of either *lævis* or *cinereus*. The head is decidedly larger than in either of these species, and when measured to the posterior corner of the gill-opening, rather exceeds a tenth of the whole fish. A deep furrow runs along the middle of the back, which is narrower than the belly from the head to opposite the anus, and the action of the muscles produces a furrow coincident with the lateral line, which disappears when the parts are stretched. The belly is rounded. The lateral line in the middle of the height is composed of a series of very fine grooves, and is darker than the neighbouring parts. The tail is edged above and below by a very narrow translucent seam of pale skin entirely destitute of rays.

The ground colour, after maceration in spirits, is wood-brown, thickly speckled on the head, back and sides with dark umber-brown. On the top of the back the umber-brown specks are arranged so as to produce three lines, one occupying the mesial groove, and the other two the ridges on each side. On the sides the specks produce two series of short curves which meet at the lateral line in an angle and seem to correspond with the fasciculi of muscular

fibres. The specks however are not confined to these lines. The belly is without specks, but is marked by fine oblique brown lines which meet on the mesial line beneath, in an acute angle, and thus produce a series of chevrons reaching from the gill-opening to the anus.

I had given a specific name to Dr. Cantor's specimen, which was altered to *marmoratus*, on a *Monopterus* so named by the authors of the 'Fauna Japonica,' having reached the British Museum. This fish is 23 inches in length, and the vent is rather farther back than in the Chinese example, being only 3·2 inches distant from the point of the tail. Three rays appeared very obscurely in the extreme tip of the tail.

Hab. Chusan.

MONOPTERUS? HELVOLUS. *Icon.* Reeves, t. nullo numero; Hardw. 312.

The figure represents a fish with a depressed head, a blunt snout, no nasal tubes, and the general form of the preceding *Monopteri*. The position of the anal aperture is not indicated. The colour is rich reddish-orange, like that of the *Cyprinus auratus*, varied only by a series of black dots along the lateral line. Eye small, silvery, and placed rather high.

Hab. Canton.

OPHICARDIA XANTHOGNATHA, Richardson (*Monopterus*), *Ichth. Voy.* Sulph. p. 118. pl. 52. f. 7. *Icon.* Reeves, 221; Hardw. Malac. 311. Chinese name, *Hwang sae shen* (Birch); *Wang sae shen*, "Yellow-jawed eel" (Reeves). Genus, *Ophicardia*, M'Clelland.

We have seen no specimen of this fish, and we were unable at the time of the publication of the 'Ichthyology of the Voyage of the Sulphur,' to place in it its proper genus; but having since received Mr. M'Clelland's important paper on the Apodal fishes of Bengal, and compared his outline figure and account of *Ophicardia phayriana* with Mr. Reeves's drawing, we have no doubt of both being members of one genus. In the Chinese fish the mouth is cleft rather farther past the eye, and this is the chief external difference between it and *phayriana*.

Hab. Canton.

ADDENDA.

The preceding report was drawn up before any portion of the Ichthyology of the 'Fauna Japonica' had reached this country, but as the successive decades of that important work came out, the new scientific names therein published have been substituted for those which I had previously imposed, the descriptions of such species have been struck out, and the Japanese fish which had not been detected on the coasts of China were added. I have also availed myself of the specimens of Japanese fish which the British Museum has from time to time received from Germany, and have adopted the names on their several labels. But notwithstanding every exertion to avoid the introduction of synonymous appellations, this evil cannot be entirely averted, in cases like the present, when several works on the same subjects are coming out simultaneously. In some instances the names proposed by English ichthyologists have the priority over those used in the 'Fauna Japonica,' the authors of this work having probably had no opportunity of consulting the papers of Dr. Cantor and of John M'Clelland, Esq., of the Bengal Medical Service, published in India. There is also some interference of names between the 'Fauna Japonica' and the 'Ichthyology of the Voyage of the Sulphur,' composed of three fasciculi, of which the first one was published in April 1844, and the third in October 1845. I may add also that the genus *Hoplegnathus* proposed by me in March 1841, and published in the Transactions of the Zoological Society of London in 1842, is identical with the *Scurodon* of the 'Fauna Japonica.' The tenth decade of this latter work was brought to this country in March 1846, by its publisher, when the seventh sheet of the Report was in the press, and it is therefore necessary to make such corrections and additions to the previous sheets as are requisite

from the decades of the 'Fauna' which reached us after the previous sheets were printed off.

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CARCHARIAS MELANOPTERUS, Temm. et Schl. F. J. Sieb.

A Japanese specimen in the British Museum.

Hab. Sea of Japan, in addition to habitats previously given.

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PRISTIOPHORUS CIRRHATUS, Lath. Linn. Trans. ii. pl. 26 et 27. (*Pristis*), Müll. et Henlè, seite 98. *Squalus tentaculatus*, Shaw, Nat. Misc. 630. *Sq. anisodon*, Lacép. iv. p. 679.

The British Museum possesses various specimens from Australia, which may be divided into two groups; one having a more slender beak and the barbels placed midway between the base and tip, and the other having a wider beak, with the barbels nearer the base. There is a Japanese specimen also in the museum.

Hab. Seas of Japan and Australia.

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PTEROPLATEA JAPONICA, Temm. et Schl. F. J. Sieb.

The British Museum possesses two foetal specimens from Japan which measure $5\frac{1}{2}$ inches across the disc, 3 along it, and $4\frac{3}{4}$ including the tail. They seem to differ very little from *Pteroplatea micrura*.

Hab. Sea of Japan.

TETRODON PÆCILINOTUS, Temm. et Schl. F. J. Sieb. *Rad.* D. 13; A. 11; C. $8\frac{1}{2}$; P. 15. (Spec. Brit. Mus. 8 inches long.)

This *Tetrodon* is marked much like *T. albo-plumbeus*, but the spines extend further along the back to the tail, and there are some slight differences in the courses of the porous lines. It is probable nevertheless that it is the same species with *albo-plumbeus*, since there are two other Japanese specimens in the British Museum, which are intermediate between the two in the extent of the spiny surface and in other minute characters. This being the case renders it probable that the small specimen which we have reckoned to be a variety of *ocellatus*, under the name of *var. guttulata*, ought also to be referred to *albo-plumbeus*.

Hab. Sea of Japan.

TETRODON RUBRIPES, Temm. et Schl. F. J. Sieb. *Rad.* D. 16; A. 13; C. $9\frac{1}{2}$; P. 17. (Spec. Brit. Mus. from Japan, 19 inches long.)

Hab. Sea of Japan.

(TETRODON LATERNA), *Tetrodon pardalis*, Temm. et Schl. F. J. Sieb. (Spec. Brit. Mus. 13 inches long. *Rad.* D. 11; A. 11; C. 9; P. 17.)

The specimen shows more spots than are exhibited in Mr. Reeves's drawing, and the nasal cirrus is scarcely so much developed, but there is no reason to doubt the identity of *laterna* and *pardalis*. The skin is smooth throughout, but pits slightly on the belly in drying.

Hab. Japan and China. Pulo Condore.

TETRODON XANTHOPTERUS, Temm. et Schl. F. J. Sieb. *Rad.* D. 16; A. 14; C. $9\frac{1}{2}$; P. 18. (Spec. Brit. Mus. $14\frac{1}{2}$ inches long.)

Hab. Sea of Japan.

TETRODON STICTINOTUS, Temm. et Schl. F. J. Sieb. *Rad.* D. 16; A. 14; C. $9\frac{1}{2}$; P. 15. (Spec. Brit. Mus. 15 inches long.)

Hab. Sea of Japan.

TETRODON STRIATUS, Temm. et Schl. F. J. Sieb. *Rad.* D. 11; A. 10; C. $9\frac{1}{2}$; P. 11. (Spec. Br. Mus. $5\frac{1}{2}$ inches long, $3\frac{1}{4}$ in diameter.)

This has the characters ascribed by Linnæus to *hispidus*; and it has much resem-

blance to *T. lineatus* of Bl. t. 141, in the lines on the belly, but the dorsal stripes are replaced by spots. It is entirely and coarsely hispid, except the lips and trunk of the tail.

Hab. Sea of Japan.

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OSTRACION BREVICORNIS, Temm. et Schl. F. J. Sieb. *Rad.* D. 10; A. 11; C. $9\frac{1}{2}$; P. 11. (Spec. Brit. Mus. $3\frac{3}{4}$ inches long.)

Of the division of *auritus*. Does it differ from *aculeatus* of Houttuyn?

Hab. Sea of Japan.

BALISTES LINEATUS, Bl. Schn. p. 466. t. 87; Temm. et Schl. F. J. Sieb.

The British Museum possesses one of Bürger's Japanese specimens, and there is an individual in excellent condition in Sir Edward Belcher's collection. This was not introduced into our list, from the place of its capture not having been noted, but the existence of the species in the Japanese seas leaves little doubt of Belcher's specimen having been obtained on the coast of China, where the bulk of his collection was made.

Hab. Seas of Japan and China, and the Indian ocean.

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MONACANTHUS CIRRHIFER, Temm. et Schl. F. J. Sieb. *Rad.* D. 1|—33 ad 35; A. 33; C. 12; P. 14. (Three Spec. Brit. Mus. from Japan.)

Hab. Sea of Japan.

MONACANTHUS OBLONGUS, Temm. et Schl. F. J. Sieb. *Rad.* D. 1|—33; A. 32; C. 12; P. 13. (Spec. Brit. Mus. from Japan, 7 inches long.)

Hab. Sea of Japan.

ALEUTERIUS CINEREUS, Temm. et Schl. F. J. Sieb. is *Al. berardi* of the preceding list. (Spec. Brit. Mus. from Japan.)

Hab. Seas of Japan, China, and New Guinea.

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GOBIUS FLAVIMANUS, Temm. et Schl. F. J. Sieb. p. 141. pl. 74. f. 1. "*Rad.* D. 8|—15; A. 12; C. 18; P. 16; V. 5." (*l. c.*) Length from 8 to 12 inches.

Hab. Mouths of rivers in the bay of Nagasaki, Japan.

GOBIUS BRUNNEUS, Temm. et Schl. F. J. Sieb. p. 142. pl. 74. f. 2. "*Rad.* D. 6|—10; A. 8; C. 18; P. 20; V. 1|5." (*l. c.*) Length 4 or 5 inches.

This is perhaps identical with our *G. platycephalus*.

Hab. Mouths of rivers in the bay of Nagasaki, Japan.

GOBIUS OLIVACEUS, Temm. et Schl. F. J. Sieb. p. 143. pl. 74. f. 3. "*Rad.* D. 6|—10; A. 8; C. 14; P. 18; V. 5." (*l. c.*) Length 5 inches.

Hab. Japan.

GOBIUS VIRGO, Temm. et Schl. F. J. Sieb. p. 143. pl. 74. f. 4. "*Rad.* B. 4; D. 8|—26 ad 28; A. 1|26; C. 20; P. 22; V. 5." (*l. c.*)

Hab. Mouth of the bay of Nagasaki, Japan.

GOBIUS HASTA, Temm. et Schl. F. J. Sieb. p. 144. pl. 76. f. 1. *Rad.* D. 9|—1|19; A. 17; C. $17\frac{1}{4}$; P. 19; V. 1|5. (Spec. in Brit. Mus. from Japan, measuring $9\frac{3}{4}$ inches.)

This fish is more elongated and has a lower dorsal and longer caudal than our *G. ommaturus*, but in other respects approaches very near to it. There are more scales scattered on the cheek, and the jointless rays at the base of the caudal are more numerous and more conspicuous. These are the principal differences elicited by a comparison of specimens. The

porous lines on the cheek and jaws and the clusters of scales on the gill-cover and temples are the same in both. The caudal fin of the specimen is an inch and a half long.

Hab. Japan.

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SICYDIUM OBSCURUM, Temm. et Schl. F. J. Sieb. p. 144. pl. 76. f. 1. "*Rad.* D. 6|11; A. 10 vel 11; C. 16; P. 16; V. 10." (*l. c.*) Length 4 inches.

Hab. Rivers in the bay of Nagasaki, Japan.

AMBLYOPUS LACÉPÈDII, Temm. et Schl. F. J. Sieb. p. 145. pl. 75. f. 2. "*Rad.* B. 5; D. 6|42; A. 1|41; C. 15; P. 32; V. 12." (*l. c.*) Length 15 inches.

This species differs in the length of the caudal, the height of the other fins, and in colour from *Amblyopus rugosus* and *anguillaris*, described in p. 207 of the Report. In the numbers of the rays it approaches the species noticed in the foot note to that page.

Hab. In the mud of bays on the coast of Japan.

PERIOPHTHALMUS MODESTUS, Temm. et Schl. F. J. Sieb. p. 147. pl. 76. f. 2. Length 3 inches.

This fish has fewer rays in the first dorsal than the one similarly named by Cantor in his Report on the Fauna of Chusan, p. 29 (vide ante, p. 208), but his brief description offers no other discrepancy. The authors of the 'Fauna Japonica' do not appear to have been aware of the previous employment of the specific name *modestus*.

Hab. Salt ponds and shallow water on the coast of Japan.

Boleophthalmus boddaertii, Temm. et Schl. F. J. Sieb. p. 148. pl. 76. f. 3. The information given in the 'Fauna Japonica' enables us to increase our list of the places of capture of this fish, by the addition of the seas of Japan, Java and Borneo (vide Report, p. 208).

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ELEOTRIS OBSCURA, Temm. et Schl. F. J. Sieb. p. 149. pl. 77. f. 1, 2, 3. "*Rad.* D. 7|9 vel 10; A. 8 vel 9; C. 15; P. 15; V. 5." (*l. c.*) Length one foot.

The British Museum possesses two small specimens from Japan, measuring respectively 4½ and 7¼ inches.

Hab. Rivers which fall into the bay of Nagasaki, Japan.

ELEOTRIS OXYCEPHALA, Temm. et Schl. F. J. Sieb. p. 150. pl. 77. fig. 4, 5. "*Rad.* D. 6|9; A. 9; C. 16; P. 17; V. 5." (*l. c.*) Length 7½ inches.

The description of this species corresponds in many particulars with the characters of *El. cantherius*, but as the head only is represented in the plate, we cannot determine whether the general resemblance is sufficiently close to justify the suppression of one of the specific names. Mr. Reeves's drawing does not exhibit the gibbosity of the snout, occasioned by the intermaxillary pedicles which is shown in the figure in the 'Fauna Japonica,' and the colours noticed in the description in the latter work being those of the specimen after long maceration in spirits do not agree very closely with the Chinese drawing.

Hab. Japan.

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CALLIONYMUS LONGICAUDATUS (Temm. et Schl. F. J. Sieb. p. 151. pl. 78. f. 1) Is evidently the fish that we have described and figured as the female of *C. reevesii* in the Ichthyology of the Sulphur's Voyage, published in April 1844.

CALLIONYMUS ALTIVELIS, Temm. et Schl. F. J. Sieb. pl. 79. f. 1.

This is a different species from any that is noticed in the body of the Report. The letter-press relating to it has not reached us.

Hab. Sea of Japan.

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SEBASTES VENTRICOSUS, Temm. et Schl. F. J. Sieb. p. 48. pl. 20. f. 1, 2.
(Spec. Brit. Mus. 9 inches long).

This species was accidentally omitted in the body of the list.

Hab. Sea of Japan.

Page 258.

CRENILABRUS FLAGELLIFER, Temm. et Schl. F. J. Sieb. pl. 86. f. 2.

Notwithstanding some differences in profile and in the illumination of the figures, is very probably the same with the *Ctenolabrus rubellio* of the Report, the blues and reds of the *Labridæ* being, as we have already mentioned, interchangeable after the death of the fish.

CIRRHILABRUS, Temm. et Schl. F. J. Sieb. pl. 86. f. 3. (Letter-press not yet published).

Hab. Japan.

Page 311.

Fam. GADIDÆ.

BROTULA IMBERBIS, Temm. et Schl. F. J.

The British Museum possesses a specimen which is $5\frac{1}{4}$ inches long.

LEPIDOLEPRUS JAPONICUS, Temm. et Schl. F. J. Sieb.

Snout apiculated and acute; scales less strongly armed than those of the other species. The British Museum possesses two heads.

Hab. Japan.

Haslar Hospital, April 1846.

ERRATA.

P. 187, near the bottom, for *Scomberidæ*, read *Scombridæ*.

197, for TRYGNIDÆ, read TRYGNISIDÆ.

199, for OSTINOPTERYGII, M'Leay, read OSSEL.

235, line 9, for a South Australian *Serranus*, read the *Plectropoma dentex* of South Australia.

277, add to the references following PLATESSA CHINENSIS, *Icon. Descriptions of Animals*, fig. 104 & 105, pages 133 & 134.

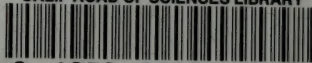
286, second line from the bottom, for *des*, read *de*.

287, line 13, for Macropterote, read Macropterote.





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