

filamentary apparatus—the homology of which, with a canal cell, is more obvious.

The foregoing sketch indicates, in a very brief manner, the outlines of the classification of the vegetable kingdom, which has been constructed in the light of the most recent studies of the comparative structure of different types. It is sufficient to say, that a detailed consideration of the new relations in which many of the groups now stand to one another by no means diminishes, but strongly confirms, the soundness of the arrangement.

The following table gives the classification in a synoptic form:—

VEGETABILIA.	
SUB-KINGDOM A. THALLOPHYTA.	
With Chlorophyll (ALGÆ.)	Without Chlorophyll (FUNGI.)
Class 1. PROTOPHYTA.	
i. Cyanophyceæ. Chroococcaceæ. Oscillatoriceæ, &c.	i. Schizomycetes.
ii. Palmellaceæ. Euglenæ.	ii. Saccharomycetes.
Class 2. ZYGOSPOREÆ.	
a. Conjugating cells motile.	
i. Pandorineæ. [? Hydrodictyæ.]	i. Myxomycetes.
ii. Conseruaceæ.	ii. Chytridineæ.
iii. Ulvaceæ.	
β. Conjugating cells non-motile.	
iv. Conjugatae. Desmidiæ, &c.	[? Protomyces.]
	iii. Zygomycetes. Mucorini, &c.
Class 3. OOSPOREÆ.	
i. Volvocineæ. ii. Sphaeropleæ. iii. Coloblastæ. Siphophyceæ. iv. Edogoniceæ. v. Fraxiceæ. [Phæosporæ.]	i. Coloblastæ. Ancylisteæ. Saprolegniæ. Peronosporæ.

BION, the second of the three Greek bucolic poets, was born in the neighbourhood of Smyrna,—according to Suidas, at Phlossa on the River Meles. The few facts known to us of his life are to be gathered from the beautiful *Ἐπιτάφιος Βίωνος* of his friend and scholar Moschus. From his account it appears that Bion left his native country and, during the latter part of his life, resided in Sicily and cultivated the form of poetry peculiarly associated with that island. He was contemporary with Theocritus and somewhat older than Moschus. His death was due to poison, administered to him by some jealous rivals who afterwards suffered the penalty of their crime. The subjects of his verses are described by Moschus as "Love and Pan;" but though his works are included in the general class of bucolic poetry, they have little of the pastoral imagery and description characteristic of Theocritus. They breathe a more refined air of sentiment, and show traces of the overstrained reflection frequently observable in later developments of pastoral poetry. The longest and best of his extant works is the *Lament for Adonis* (*Ἐπιτάφιος Ἀδώνιδος*), the prototype of many modern poems. His other pieces are short and in many cases fragmentary. Two of the Idylls (xix. and xx.) of Theocritus are frequently ascribed to him. Bion and Moschus are edited separately by Hermann (1849).

Class 4. CARPOSPOREÆ.	
h Chlorophyll (ALGÆ.)	Without Chlorophyll (FUNGI.)
i. Coleochaeteæ.	i. Ascomycetes. Lichenes, &c.
ii. Florideæ. Nemaliæ. Ceramiæ, &c.	ii. Ascidiomycetes.
iii. Characeæ.	iii. Basidiomycetes.

#### SUB-KINGDOM B. CORMOPHYTA.

##### Series I. BRYOPHYTA.

- Class 1. Musci.  
Class 2. Hepaticæ.

##### Series II. PTERIDOPHYTA.

- Class 1. Filicales.  
i. Stipitatae.  
Ophioglossæ.  
Marattiaceæ.  
n. Filices.  
iii. Rhizocarpeæ.

##### Class 2. Equisetaceæ.

##### Class 3. Dichotomæ.

- i. Lycopodiaceæ.  
Lycopodiæ.  
Psiloteæ.  
Phylloglossæ.  
ii. Ligulatae.  
Selaginellæ.  
Isoeteæ.

##### Series III. PHANEROGAMÆ.

- Class 1. Gymnospermæ.  
Class 2. Angiospermæ.

- i. Monocotyledones.  
ii. Dicotyledones.

See *A Text-Book of Botany, Morphological and Physiological*, by Julius Sachs (3d edition), translated by A. W. Bennett, assisted by W. T. Thiselton Dyer; *Lehrbuch der Botanik*, von Dr Julius Sachs, vierte Auflage; *Quarterly Journal of Microscopical Science*, new series, vols. i.-xv. (W. T. T. D.)

and Ziegler (1869). The best annotated editions are those of Heindorf (1810), Meineke (1856), Ahrens (1855-9), Fritsche (1870), all of which contain also the works of Theocritus. The *Epitaphius Adonidis* is edited separately by Ahrens, 1854.

BIOT, JEAN BAPTISTE, French physicist, was born at Paris, 21st April 1774. After leaving school he served for a short time in the artillery, but again resumed his studies at the Ecole Polytechnique. He distinguished himself in mathematics, and was appointed to a professorship at Beauvais. There he carried on his researches with the greatest assiduity, and gained the acquaintance and friendship of Laplace, from whom he solicited and obtained the favour of reading the proof-sheets of the *Mécanique Céleste*. In 1800 he was recalled to Paris as professor of physics at the Collège de France. Three years later he was elected a member of the Academy of Sciences, a distinction rarely accorded to one so young as he was. In 1803 Biot, in concert with Arago, investigated the refracting properties of gases, and in the following year accompanied Gay-Lussac in his balloon ascent. He was again associated with Arago in the great undertaking of the measurement of an arc of the meridian in Spain, and at a later date (1817-18) he crossed over to Britain and measured

carefully the length of the seconds' pendulum along an arc extending to the extreme north of Shetland. In 1814 he was made a chevalier of the Legion of Honour, an order of which he became a commander in 1849. He was a member of the French Academy and of the Academy of Inscriptions and Belles-Lettres, as well as of most foreign scientific societies. In 1840 he received the Rumford gold medal for his researches in polarized light. He died at an advanced age in 1862. Biot's researches extended to almost every branch of physical science; but his greatest discoveries were made in the department of optics, mainly in connection with the polarization of light. He had a thorough command of the best methods of analysis, and applied mathematics rigidly and successfully to physical phenomena. His various dissertations in the *Memoirs* of the Academy are very numerous; a selection of the more valuable was published in 1858. His systematic works—*Traité Élémentaire d'Astronomie Physique* (1805, 3d ed., 1841-57, 6 vols.), *Traité de Physique* (1816, 4 vols.), *Précis Élémentaire de Physique Expérimentale* (1817, 3d ed., 1824, 3 vols.)—are of great merit, though necessarily in some respects behind the present state of physical science.

BIR, or BIREJIK (the former being its Arabic and the latter its Turkish name), a town of Asiatic Turkey, in the pashalik of Rakka, built on the side of a chalky range of hills that skirts the left bank of the Euphrates, about 90 miles N.E. of Aleppo, in long. 38° 6' E., and lat. 36° 48' N. It consists of about 2000 houses, surrounded by a dilapidated wall and protected by the citadel of Kalai-Beda, which, with its earthquake-shattered interior, occupies a precipitous eminence cut off from the town. Bir is situated on the main route from Aleppo to Orfa, Diarbekr, and the Persian frontier, and had formerly a considerable trade with Baghdad by means of the river. It is now a post and telegraph station. A ferry seems to have crossed the river at this spot from time immemorial, Abraham himself having made use of it, according to tradition, on his passage from Haran to Canaan. The town is identified with the ancient Birtha or Britha, where the empereur Julian rested on his march to Maogamalcha, and found quarters for his army in one extensive palace. In the English Euphrates expedition Bir was frequently visited, Fort William, one of the principal places of rendezvous, being about 2 miles further down on the other side of the river. (See view in Chesney's *Narrative of Euphrates Expedition*, 1868.)

BIRBHŪM, a district of British India, within the Bardwān division, under the lieutenant-governor of Bengal, situated between 24° 23' 10" and 23° 34' 54" N. lat., and 88° 3' 54" and 87° 7' 41" E. long. It is bounded on the N. by the districts of Santāl Parganās and Bhāgalpur; on the E. by the districts of Murshidābād and Bardwān; on the S. by the River Ajai, separating it from the district of Bardwān; and on the W. by the districts of the Santāl Parganās. The census of 1872 returned the area of the district at 1344 square miles, and the total population at 695,921 souls, residing in 2471 villages and 159,904 houses. Pressure of population per square mile, 518; per village, 282; per house, 4.3. Of the total population, 576,908, or 82.9 per cent., were Hindus; 111,795, or 16.1 per cent., Mahometans; 249 Christians; and 3440, consisting principally of aboriginal tribes, of unspecified religions. The eastern portion of the district is the ordinary alluvial plain of the Gangetic Delta; the western part consists of undulating beds of laterite resting on a rock basis, and covered with small scrub jungle. The Ajai, Bakheswar, and Mor or Maurakshī, are the principal rivers of the district, but they are merely hill streams and only navigable in the rains. Rice, wheat, sugar-cane, pulses, oil-seeds, and mulberry form the agricultural products of the district. The chief manufactures are silk, silk cloth, and

lacquered ware. The principal seats of trade are Dubrājpur, Ilāmbāzār, Bolpur, Sinthiā, Purandarapur, Krinnāhār, Muhammad Bāzār, and Ahmādpur. The total net revenue of the district in 1870-71 amounted to £97,979; the civil expenditure to £27,278. The land tax forms the most important item of revenue. In 1870-71 it amounted to £73,261, paid by 556 estates, held by 2036 proprietors, under the Permanent Settlement as in other parts of Bengal. The district and municipal police force amounted to 320 officers and men, at a total cost of £5895 in 1871. Besides these there were 8554 men of the village watch, maintained at a total cost of £23,074, paid by service lands and by the villagers. In 1872 Bīrbhūm contained 604 schools, attended by 9338 pupils, costing £989 to the state for the education of its people. There are seven principal roads in the district, the total mileage being 191, and the average cost of their maintenance £1784. Thirty-three miles of the East Indian Railway lie within the district. Until lately Bīrbhūm was considered to be the healthiest district in Bengal; but during the past few years epidemic fever has made havoc among the rural population of the eastern portion of the district.

BĪRBHŪM, or SURĪ, the principal town and administrative headquarters of the district of the same name, is situated in 23° 54' 25" N. lat., and 87° 34' 23" E. long. In 1872 it contained a population of 9001, of whom 6746 were Hindus, 2056 Mahometans, 187 Christians, and 12 of unspecified religions. Municipal income of the town in 1871, £483, 18s.; expenditure, £473, 8s.; rate of municipal taxation, 1s. 8d. per head.

BIRCH (*Betula*), a genus of arborescent plants constituting the principal portion of the natural order *Betulaceæ*. The various species of birch are mostly trees of medium size, but several of them are merely shrubs. They are as a rule of a very hardy character, thriving best in northern latitudes,—the trees having round, slender branches, and serrate deciduous leaves, with barren and fertile catkins on the same tree and winged seeds. The bark in most of the trees occurs in fine soft membranous layers, the outer cuticle of which peels off in thin white papery sheets. The common birch (*B. alba*) grows throughout the greater part of Europe, and also in Asia Minor, Siberia, and North America, reaching in the north to the extreme limits of forest vegetation, and stretching southward on the European continent as a forest tree to 45° N. lat., beyond which birches occur only in special situations or as isolated trees. It is one of the most wide-spread and generally useful of forest trees of Russia, occurring in that empire in vast forests, in many instances alone, and in other cases mingled with pines, poplars, and other forest trees. The wood is highly valued by carriage-builders, upholsterers, and turners, on account of its toughness and tenacity, and in Russia it is prized as firewood and a source of charcoal. A very extensive domestic industry in Russia consists in the manufacture of wooden spoons, which are made to the extent of 30,000,000 annually, mostly of birch. Its pliant and flexible branches are made into brooms; and in ancient Rome the fasces of the lictors, with which they cleared the way for the magistrates, were made up of birch rods. A similar use of birch rods has continued among pedagogues to times so recent that the birch is yet, literally or metaphorically, the instrument of school-room discipline. The bark of the common birch is much more durable, and industrially of greater value, than the wood. It is impermeable to water, and is therefore used in northern countries for roofing, for domestic utensils, for boxes and jars to contain both solid and liquid substances, and for a kind of bark shoes, of which it is estimated 25 millions of pairs are annually worn by the Russian peasantry. The jars and boxes of birch bark made by Russian peasants are often stamped

with very effective patterns. By dry distillation the bark yields an empyreumatic oil, called *diogott* in Russia, used in the preparation of Russia leather; to this oil the peculiar pleasant odour of the leather is due. The bark itself is used in tanning; and by the Samoiedes and Kamchatkans it is ground up and eaten on account of the starchy matter it contains. A sugary sap is drawn from the trunk in the spring before the opening of the leaf-buds, and is fermented into a kind of beer and vinegar. The whole tree, but especially the bark and leaves, has a very pleasant resinous odour, and from the young leaves and buds an essential oil is distilled with water. The leaves are used as fodder in northern latitudes. The species which belong peculiarly to America (*B. lenta*, *excelsa*, *nigra*, *papyracea*, &c.) are generally similar in appearance and properties to *B. alba*, and have the same range of applications. The largest and most valuable is the black birch (*B. lenta*), found abundantly over an extensive area in British North America, growing 60 to 70 feet high, and 2 to 3 feet in diameter. It is a wood most extensively used for furniture and for carriage building, being tough in texture and bearing shocks well, while much of it has a handsome grain, and it is susceptible of a fine polish. The bark, which is dark brown or reddish, and very durable, is used by Indians and backwoodsmen in the same way as the bark of *B. alba* is used in Northern Europe. Concerning the canoe or paper birch (*B. papyracea*), which some regard as a variety of the white birch, Mr Bernard R. Ross, of the Hudson's Bay Company, writes:—"The canoe or paper birch is found as far north as 70° N. on the American continent, but it becomes rare and stunted in the Arctic circle. It is a tree of the greatest value to the inhabitants of the Mackenzie River district in British North America. Its bark is used for the construction of canoes, and for drinking cups, dishes, and baskets. From the wood, platters, axe handles, snow-shoe frames, and dog sledges are made, and it is worked into articles of furniture which are susceptible of a good polish. The sap which flows in the spring is drawn off and boiled down to an agreeable spirit, or fermented with a birch-wine of considerable alcoholic strength. The bark is also used by the Christianized American Indians as a substitute for paper." A species (*B. Bhojputtra*) growing on the Himalayan Mountains, as high up as 9000 feet, yields large quantities of fine thin papyry bark, extensively sent down to the plains as a substitute for wrapping-paper, for covering the "snakes" of hookahs, and for umbrellas. It is also said to be used as writing paper by the mountaineers; and in Kashmir it is in general use for roofing houses.

BIRCH, THOMAS, historical and biographical writer, and one of the early trustees and benefactors of the British Museum, was born in London, November 23, 1705. He was the son of a coffee-mill maker, and was to have followed his father's business; but his active mind and ambition of higher pursuits led him into the paths of literature. His parents were members of the Society of Friends, and therefore he had not the advantages of a university training. But by persevering application to study and to teaching he qualified himself for the ministry of the Church of England. In 1728 he obtained a curacy, and in the same year he married. His wife died in the following year. He was ordained priest in December 1731, and was soon after recommended to the favour of Philip Yorke, then attorney-general, afterwards Lord Chancellor and earl of Hardwicke, to whom he owed his successive preferments in the church. His first benefice was the vicarage of Ulting in Essex. In 1734 he was appointed domestic chaplain to the earl of Kilmarnock, who was beheaded for his share in the rebellion of '45. He afterwards held successively benefices in Pembrokeshire, Gloucestershire, and the city of London. His last church

preferment was to the rectory of Depden in Essex, to which he was presented in February 1761. In his latter years he was appointed chaplain to the princess Amelia. His literary attainments procured him election as a fellow of the Royal Society in February 1735, and in the following December he was chosen a member of the Society of Antiquaries. He held the office of Secretary to the Royal Society for thirteen years 1752-1765. From the university of Aberdeen he received the degree first of M.A., and afterwards (1753) of D.D. The degree of D.D. was also conferred on him about the same time by the archbishop of Canterbury. Dr Birch was engaged in a large number of literary undertakings. His appetite and his capacity for hard work were extraordinary. Besides his diversified labours of compilation and editing, he transcribed many volumes in the library of Lambeth Palace, and carried on an extensive correspondence with literary men. He was an early riser; and amidst all his labours he found time to take part in social enjoyments. He was only in his sixty-first year when he was killed by a fall from his horse in Hampstead Road, January 9, 1766. He bequeathed his books and manuscripts, with part of his pictures and prints, to the British Museum. The rest of his property, in value about £500, he gave to be invested in Government securities, the interest to be applied in augmenting the salaries of the three assistant librarians.

His principal publications were: 1. *The General Dictionary, Historical and Critical*, including a new translation of Bayle, and interspersed with several thousand new lives, in 10 volumes fol., 1734-1741. 2. *Thurloe's State Papers*, 7 vols. folio, 1742. 3. *Dr Cudworth's Intellectual System, improved from the Latin edition of Moshem*; his *Discourse on the true Notion of the Lord's Supper*; and two *Sermons*, with an *Account of his Life and Writings*, 2 vols. 4to, 1743. 4. *The Life of the Honourable Robert Boyle*, 1744, prefixed to an edition of that philosopher's works. 5. *The Lives of Illustrious Persons of Great Britain*, to accompany the engravings of Houbraken and Vertue, 1747-1752. 6. *An Inquiry into the Share which King Charles I. had in the Transactions of the Earl of Glamorgan*, 1747, 8vo. 7. An edition of *Spenser's Faery Queen*, 1751, 3 vols. 4to, with prints from designs by Kent. 8. *The Miscellaneous Works of Sir Walter Raleigh, with his Life*, 1751, 2 vols. 8vo. 9. *The Theological, Moral, Dramatic, and Poetical Works of Mrs Catherine Cockburn, with a Life*, 1751, 2 vols. 8vo. 10. *The Life of Dr Tillotson, Archbishop of Canterbury, compiled chiefly from his Original Papers and Letters*, 1762, 8vo. 11. *Milton's Cross Works*, 1753, 2 vols. 4to, with a Life. 12. *Memoirs of the Reign of Queen Elizabeth, from the year 1581 till her death*; illustrated from the original papers of Anthony Bacon, Esq., and from other MSS., 1754, 2 vols. 4to. 13. *The History of the Royal Society of London*, 1756 and 1757, 4 vols. 4to. 14. *The Life of Henry Prince of Wales, eldest son of James I., compiled chiefly from his own papers and other MSS.*, 1760, 8vo. 15. *The Letters, Speeches, &c., of Lord Chancellor Bacon*. His numerous communications to the Royal Society may be seen in the *Philosophical Transactions*.

BIRD, WILLIAM, an English composer, and one of the best organists of his time, was born about 1540, and died at London, 4th July 1623. He was appointed organist of Lincoln cathedral in 1563; and in 1575 he and his master Tallis were gentlemen of the chapel royal, and organists to Queen Elizabeth. Bird was the earliest English composer of madrigals, and some of his numerous sacred compositions are still much esteemed. Most of them were published during his lifetime under a patent from Queen Elizabeth, which secured to him and Tallis the sole right to print and sell music. Between 1575 and 1611 there were issued under this patent eight different collections of his works, with such titles as *Cantiones Sacre*; *Gradualia*; *Psalmes, Songs, and Sonets*, &c. The vocal canon *Non nobis Domine*, generally attributed to him, is well known, and often sung. He also wrote a number of pieces for Queen Elizabeth's Virginal Book, and other similar collections. In his compositions there is a freedom and elegance rarely found in the music of his period. A full account of Bird's life by E. F. Rimbault is prefixed to one of his Masses, published by the Musical Antiquarian Society.

## B I R D S

## ANATOMY OF BIRDS.

IN the consideration of the Anatomy of Birds, classification will be quite a secondary matter, and merely employed for the elucidation of internal structure. Some sort of grouping, however, is indispensable; and that is accordingly adopted, as the most convenient for the morphologist, which was first proposed by Professor Huxley,<sup>1</sup> with the introduction of certain modifications rendered necessary by the present writer's own researches—researches, it may be added, which have been carried on in constant communication with that investigator.

A little examination will show that the groups made by consideration of any, even the most important, morphological modifications, cannot be *superimposed upon* groups made by reference to the whole sum of the characters of the Bird. This may be easily explained. About half the known Birds, 5000 or thereabouts, belong, according to G. R. Gray, to Professor Huxley's group, the *Coracomorphæ*. These birds undergo a peculiar metamorphosis of the naso-palatal structures, and are called by Professor Huxley the *Ægithognathæ* on that account. Now all the *Coracomorphæ* have the ægithognathous palate, but so also have the *Cypselidæ*, or Swifts, which are placed by this author with the Humming-birds and Goatsuckers, both of which groups are simply schizognathous. Moreover, below the Passerine types, and only next above the Semi-struthious Tinamous, we find the Hemipods, *Turnicidæ*, or *Turnicimorphæ*, and these have an ægithognathous palate. So also has another type, *Thinocorus*, which lies on the same low zoological level as the Hemipods. This latter bird is essentially a small Geranomorph, but it is below the true Cranes, and unites in its palate characters belonging to the Ostriches below it and the Passerines which ascend, zoologically, far above it.

The difficulty of applying this very valuable morphological grouping, and making it fit in with one that is more general and distinctively zoological (that is, having reference to every character, external and internal), does not take away anything of real value from it. To the anatomist such a mode of viewing the various types is perfectly natural, however hard it may be to satisfy the pure zoologist as to its great value. Certainly, the structures of the skull and face govern the whole body, as it were; every other part of the organism corresponds to what is observable there. Nor must it be forgotten that the true mode of studying any kind of creature is that of its *development*; and the head undergoes the most remarkable morphological changes.

In the following scheme we have added one new morphological group to Professor Huxley's classification. This group includes the Woodpeckers and Wrynecks, *Picidæ* and *Yungidæ*. Zoologically it forms the family *Celeomorphæ* (Huxley); its morphological term is *Sauromorphæ* (Parker).

<sup>1</sup> "On the Classification of Birds; and of the taxonomic value of the modifications of certain of the cranial bones observable in that class," *Proceedings of the Zoological Society*, April 11, 1867, pp. 415-472. This classification is somewhat modified in a later paper by the same author, in which a very masterly description is given of the Gallinaceous group (*Alectoromorphæ*, Huxley), "On the Classification and Distribution of the *Alectoromorphæ* and *Heteromorphæ*," *ibid.*, May 14, 1868, pp. 293-319. The same author repeats, in essentially the same form, the original classification in his *Anatomy of the Vertebrated Animals* (1871, p. 272). The materials from which the modified views here given have been taken are in a series of contributions by Mr Parker to the *Transactions of the Linnean and Zoological Societies* now (1875) passing through the press. For figures of the skeleton see Mr Eytton's *Osteologia Avium*.

Every one who has laboured at the anatomy of this class must have been struck by its marvellous uniformity; almost countless numbers of species are found passing insensibly into one another, and differing in the slightest manner. The best modern zoologists are at times almost at their wits' end to know by what characters they may distinguish their genera and species. This has been well put by Professor Huxley (*Anat. of Vert. Anim.*) He says (p. 272)—"Though this class contains a great number of specific forms, the structural modifications which they present are of comparatively little importance; any two birds which can be selected differing from one another far less than the extreme types of the *Lacertilia*, and hardly more than the extreme forms of the *Chelonina*, do. Hence the characters by which the following groups" (see subjoined table) "are separated appear almost insignificant when compared with those by which the divisions of the *Reptilia* are indicated."

## MORPHOLOGICAL CLASSIFICATION OF BIRDS.

A. The metacarpals not ankylosed together: The tail longer than the body.

## I. SAURURÆ.

1. *Archæopterygidæ*.

B. The metacarpals ankylosed together. The tail considerably shorter than the body.

A. The sternum devoid of a keel.

## II. RATITÆ.

a. The wing with a rudimentary, or very short, humerus, and with not more than one ungual phalanx.

a. A hallux.

2. *Apterygidæ* (the Kiwis).

B. No hallux.

3. *Dinornithidæ* (the Moas).

4. *Casuariidæ* (the Cassowaries and Emews).

b. The wing with a long humerus, and with two ungual phalanges.

a. The ischia uniting immediately beneath the sacrum, and the pubes free.

5. *Rheidæ* (the American Ostriches).

B. The ischia free, and the pubes uniting in a ventral symphysis.

6. *Struthionidæ* (the Ostriches).

The sternum provided with a keel.<sup>2</sup>

## III. CARINATÆ.

a. The vomer broad behind, and interposing between the pterygoids, the palatines, and the basi-sphenoidal rostrum (*Dromæognathæ*).

7. *Tinamomorphæ* (the Tinamous).

b. The vomer narrow behind; the pterygoids and palatines articulating largely with the basi-sphenoidal rostrum.

a. The maxillo-palatines free.<sup>3</sup>

i. The vomer pointed in front (*Schizognathæ*).

8. *Charadriomorphæ* (the Plovers).

9. *Cecomorphæ* (the Gulls).

10. *Spheniscomorphæ* (the Penguins).

11. *Geranomorphæ* (the Cranes).

12. *Alectoromorphæ* (the Fowls).

13. *Pterocloromorphæ* (the Sand-Grouse).

14. *Peristeromorphæ* (the Pigeons).

15. *Heteromorphæ* (the Hoazins).

16. *Coccygomorphæ* (part), (the Goatsuckers).

<sup>2</sup> The keel is but little developed in *Strigops* (*Psittacidæ*), in *Didus* (*Dididæ*), and in *Aptornis* (*Rallidæ*).

<sup>3</sup> Professor Huxley here gives in a note two exceptions, namely, *Craux* and *Dicholophus*. The latter bird, the Cariama, is, however, as Mr Parker has shown, a low, gruff-form, rapacious bird, having its maxillo-palatines united by suture, and being an example of a bird with *imperfect direct desmognathism*.

<sup>4</sup> With the exception of *Thinocorus*, see below.