

shallow grooves. In the small Monkeys with claws, as Midas, they are nearly quite flat. In the Dog, the Otter, and the Seal, among the Carnivora, the convolutions are far more numerous than in the Feline tribes, as is the case also in the Horse and the Ruminant. The Elephant is remarkable for a well-developed cerebrum, provided with numerous deep furrows. In the ordinary Apes the furrows are fewer in number than in the last-named orders, and are deficient in symmetry upon the two sides. The grooves are still more numerous in the brain of the Dolphin, which is so remarkable for its rounded form. The ventricles and choroid plexuses resemble those of Man; yet it is usually only the anterior and middle or descending cornu of the lateral ventricle which is developed, the posterior occurring in those orders only where the posterior cerebral lobes are present. The lesser pes hippocampi is almost always wanting, while the cornu Ammonis with the corpus fimbriatum is usually found very large, *e. g.* in the Rodentia. In like manner the fornix and septum lucidum are met with. The concretions of the pineal body are wanting. The lateral ventricles communicate in those orders which are furnished with conspicuous mammillary processes or ganglia for the olfactory nerves, namely, in the Rodentia, Ruminantia, Pachydermata, Edentata, Marsupiatia, and Feræ. These ganglia form triangular, obtuse projections beneath the anterior lobes of the cerebrum.

The brain of the highest Apes, as the Orang-utang and Chimpanzee, approximates more to that of the human subject; it differs however in the very inferior proportional development of its hemispheres (the convolutions of which are at the same time more numerous and asymmetrical than in the rest of the Apes), as opposed to the cerebellum, which is still however covered by the posterior lobes of the cerebrum in old animals, as in Apes generally, *e. g.* *Celeus capucinus*. The digital impressions upon the cornu Ammonis occur only in the higher Apes. The brain of the Chimpanzee is more anthropoid than that of the Asiatic Orang-utang.

The nerves arise and are distributed after the human type, from which the olfactory pair exhibit the most departures. They are probably entirely wanting in the Cetacea, as the Dolphin, or are present only as very fine thread-like rudiments. In other animals they form, on the contrary, large hollow clavate organs, provided with numerous ganglia, which proceed from the mammillary processes. They are smaller and correspond with the human form in the Apes. The animals which have very small rudimentary eyes,

such as the Mole, have very delicate optic nerves. The fifth pair is frequently very much developed; the infra-orbital branch in particular is often of remarkable size, particularly in those animals that are provided with a snout, or with large vibrissæ upon the upper lip, to the follicles of which, it gives considerable branches.

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ORGANS OF THE SENSES.

*Organs of Vision.*

It is only in the Apes that the eye is situated, as in Man, in a complete bony cavity closed both from without and within; in all the rest of the Mammalia, and also in the Makis, the orbital and zygomatic spaces blend upon the sides of the skull. Both spaces are nevertheless separated by a peculiar membrane, which is called the orbital membrane, and was formerly regarded incorrectly as muscular; it arises from the periosteum, lines the orbits funnel-wise, and consists partly of elastic tissue. It seems to act as an antagonist to the retractor muscle of the globe of the eye, protruding or pushing the eyeball forward so soon as the action of that muscle ceases.

In other respects the Mammalia in general exhibit the greatest conformity in the structure of the eye with that of Man. Yet there are some species among the Insectivora and Rodentia, for example the *Talpa cæca*, *Spalax typhlus*, *Chrysocloris*, living under ground, in which the eye is very rudimentary, and nearly closed by the skin, so that they possess an extremely imperfect sense of vision. The globe of the eye is here very small, but appears to contain all its principal parts. In the Mammalia the transverse diameter of the eyeball is generally the largest, as in the Whale, the Walrus, and the Seal; the sclerotic is of enormous thickness in the Whales, and in the *Ornithorynchus* it is enclosed by a bony plate. In the Apes and in Man the longitudinal axis of the eye exceeds the transverse in diameter. The cornea is flat in the aquatic Mammalia. Between the sclerotic and choroid lies as usual the pigmentary layer. In addition to this there occurs in many Mammalia a membrane composed of an interlacement of delicate fibres, and having a metallic brilliancy, called the tapetum. In the Ruminantia, *Solidungula* and *Pachydermata*, it has a variegated lustre of blended green and



blue; in the Carnivora and Whales a silvery or mother-of-pearl tint. The form of the pupil varies frequently in one and the same genus; thus the Wolf and Dog have a round, the Fox a perpendicular slit-shaped pupil. In the Solidungula and Ruminantia there project from the uvea upon the border of the pupil, tuft-shaped flakes of pigment, called the racemiform or sponge-like bodies.

The lens is, in some Rodentia, but particularly in aquatic animals, such as the Cetacea and Seals, very convex and spherical. The macula lutea of the retina appears, with the exception of the Apes, to occur only in the human subject. The number and mode of attachment of the muscles of the eye are the same as in Man. The tendon, however, of the superior oblique appears to be wanting to the Cetacea. With the exception of the Apes, all the Mammalia appear also to have an additional muscle, the suspensory or retractor. This is a quadrifid muscle embracing the optic nerve, the portions of which sometimes coalesce, as in the Ruminantia, into a single infundibuliform muscle. It is fixed to the sclerotic behind the cornea.

The eyebrows and eyelashes occur only in a few Mammalia, the latter being wanting in the smaller kinds. The eyelids have the usual cartilages and muscles, and the lower lid is moveable. The third eyelid, called also the haw or nictitating membrane, has a single triangular cartilage, and is met with in nearly all the Mammalia, with the exception of the true Cetacea; it contains muscular fibres, and is drawn like a curtain over the front of the eye, so soon as the retractor muscle acts upon the latter. The Apes have, like Man, no haw, but only a rudiment of it, the plica semilunaris, in the inner angle of the eye. In the Ornithorynchus, and Echidna, the eye is closed by a single circular eyelid, with a small round opening in it. Meibomian glands and a caruncula lacrymalis are frequently present; the last, however, is wanting where the haw is much developed. The lacrymal gland with its apparatus appears to be wanting only in the Cetacea; it is often very large, and in addition to it, there is found in all animals provided with a third eyelid, as the Hare, the Harderian gland (which occurs generally in Birds) well developed, two or three ducts from it opening beneath a fold of the inner surface of that lid. The mechanism for moving the nictitating membrane is not the same as in Birds. It seems to be drawn forward the more the retractor muscle acts, when the eye by being pulled back presses within the orbit against the posterior termination of the cartilage of the nictitating membrane,

and at the same time favors the escape of the secretion from the Harderian gland.

*Organ of Hearing.*

The most important part of the organ of Hearing, the labyrinth, exhibits throughout the Mammalia in general a complete agreement with the human structure. It is completely imbedded in the dense osseous substance of the temporal bone, and in the fœtus only is surrounded by loose bony tissue. The direction of the semicircular canals and the vestibule are in their number and situation, their histological elements, and otolithic concretions, with slight variations, similar to those of the human subject. In some instances, as in the Ornithorynchus and the Mole, where the semicircular canals are very large, they project internally into the cranial cavity. Recent accurate investigations concerning the labyrinth show also that in the individual genera and orders of Mammalia a number of minor but very interesting differences occur. The least variations occur in the vestibule of the labyrinth (which is, however, all but wanting in the Whales); the greatest in the semicircular canals. In the Cats, the Cheiroptera, and Viverridæ, these canals form the segment of a circle, in the Horse they exhibit a parabolic curve, in the Camels, Goats, and in Myrmecophaga jubata, they form a portion of an ellipse, frequently also of a spiral, as in the Antilopes and some Edentata. In the Whales they are very small, smaller than in the Field-mouse, and form a segment of a circle of scarcely 90°. The Dromedary has the largest canals, and next to them, some Seals. In many, though not in all of the Mammalia, the canals open by five orifices into the vestibule. The ampullæ also in size and situation present numerous differences; there are nearly always, however, three ampullæ present, but only two in the Sloths, none being met with upon the external canal. Of all the parts of the labyrinth, the cochlea varies most, namely, in the number of its coils. In the Whales and Dolphins, it has only  $1\frac{1}{2}$  turns, though it is very large, being thus in remarkable contrast with the small canals; in Delphinus delphis it is larger than in the largest terrestrial mammal, and the spires lie upon one level. In the Hedgehog also the small cochlea makes only  $1\frac{1}{2}$  turns, but is more conical; in the Seals, 2 coils are met with, as likewise in the Chamois. Most Ruminantia, the Horse, and many of the Edentata, have not quite  $2\frac{1}{2}$  coils, which is the case too in Man, in the Apes, and Cheiroptera.



Bears, Cats, Dogs, and probably the Carnivora in general, have three complete coils; the Pig, the Squirrel, and other Rodentia, have nearly 4; in *Cælogenys Paca* nearly 5 turns are met with; in the *Ornithorynchus* and *Echidna*, on the contrary, the cochlea has only a half coil, and rather represents a semilunar cone, comparable to the cochlea of a Bird; it has, however, a modiolus and two scalæ. The size and form of the two fenestræ vary remarkably; in the Seal, for example, the foramen rotundum is three times larger than the f. ovale. The tympanic cavity offers in the class Mammalia the greatest differences of all. In Man, and in the Apes, it is completely concealed in the petrous bone; in the remaining orders, on the contrary, we find a peculiar tympanic bone which exhibits great diversities in the several orders. In the Cetacea it is large, and hard as ivory, remains completely separated from the much smaller petrous bone, and like it, is only united by ligament to the skull. In the Ruminantia, the tympanum is angular and irregular, in the Ox very cellular, and the Sheep and Goat spacious and devoid of cells. The Horse and Pig have a cellular tympanum. In many Rodentia and Carnivora, where it usually swells out into a bony bulla (very large in *Dipus*), the tympanum remains at least a very long time separated, or is united by means of a suture, which sometimes disappears at a later period; externally there is often appended or united to the tympanum a bony tympanic ring, which is not always complete above. The tympanic cavity extends occasionally into the other cavities of adjacent bones, *e.g.* in the Sloth, into the zygomatic arch. The membrana tympani is (except in the Cetacea) drawn in a somewhat funnel-shape inward, lies sometimes, as in the Mole, nearly horizontal, or approximates that position, as in many Carnivora and Edentata, while elsewhere it stands more perpendicularly, as in Man. The Eustachian tube is partly bony, partly cartilaginous, and always opens by a peculiar orifice behind the nasal passages within the fauces. In the Horse and Ass the Eustachian tube, upon either side, is always united with a membranous oviform purse or air-sac, which lies within the fauces, beneath the occipital bone, and is formed of mucous membrane, the sacs of either side being contiguous. The three auditory ossicles can in general be distinguished, namely, the malleus, the incus, with the os orbiculare and the stapes, and although their forms undergo considerable changes, we frequently recognise in them the human type, as in the Apes of the Old World. In those of the New World their form varies more; the opening into the stapes for

example, being very small. The three ossicles can still be recognised in the Rodentia, *e.g.* the Squirrel. The handle of the malleus is especially subject to variation; in the Carnivora it is very long, in the Sloth broad with a projecting ridge; in the Rodentia it is frequently formed like the blade of a knife. In *Chrysocloris* a peculiar clavate bone is found lying between the malleus and incus. Small animals not unfrequently possess very clumsily shaped ossicles, as is the case in a remarkable degree in the malleus of the Hedgehog. The stapes exhibits very interesting modifications of form. Without bearing any relation to the position of the animal in the system, it presents, for example, in the higher Apes, the Elephant, Mole, Hedgehog, Ox, only slight variations from the human form, its opening being larger or smaller, its branches equal or unequal. In some Rodentia and Insectivora, as in the Squirrel, the Marmot, the Mole, a branch of the carotid, namely, the trunk of the arteria ophthalmica and maxillaris, and in Chiroptera, the art. meningeal media, pass through the stapes and the tympanic cavity; the artery between the branches of the stapes is surrounded by a bony tube which serves as a kind of bolt (pessulus) upon which the stapes rides, and is thus prevented from entering too far into the very large foramen ovale. In the Seal and other animals the branches of the stapes are very thick, and the opening therefore very small; the latter indeed disappears completely in the Walrus, the Dolphin and the Whale. Imperforate and rod-shaped, the stapes of the *Ornithorynchus* resembles the columella of Birds, and a similar transition of form is shown in the Sloth and Kangaroo, and, as appears from recent researches, in the Marsupialia generally. The muscles of the ossicles appear to be always two in number, as in Man, the tensor tympani and stapedius. In the Horse and Ox, there is frequently found a sesamoid bone in the stapedius muscle. The cells which in Man are found in the Mastoid process of the temporal bone, are present also in the Apes, but they frequently disappear along with that process, which is often represented by an apophysis of the occipital bone; in some instances, however, small cells extend also into the squamous and even the jugal portions of the temporal.

External to the membrana tympani there lies in nearly all the Mammalia, excepting the Cetacea, the bony meatus, which differs in length, width, and direction. Attached to it is a trumpet-shaped cartilage, the concha of the ear, which is wanting only in a few Mammalia, namely, such as live in water or under the earth, as in



the Cetacea, the Walrus, many Seals, the Mole, Ornithorynchus and Pangolins. The ears are, on the contrary, in the African Elephant, very large pendulous flaps; they are much smaller in the Asiatic species; they are largest of all in many Cheiroptera, *e.g.* *Plecotus auritus*, where they are nearly as long as the body, and the tragus also is greatly developed, exhibiting manifold forms throughout this order, in which the ears are very membranous. Hanging ears appear to occur in the Dogs, Pigs, and Goats, only when domesticated. In Man the cartilage of the ear consists only of one piece, while in most Mammalia three can be distinguished. The concha is the largest cartilage, and trumpet-shaped. Above the anterior part of the convex surface of the concha lies the cartilago scutiformis, which merely serves as a surface of attachment to several muscles, but does not contribute to the formation of the concha. The cartilago annularis lies over the external auditory meatus in the lower curve of the concha, to which it is united by ligament, and completes the meatus. While in Man the muscles of the external ear are only feebly developed, and that organ can be but slightly moved, very numerous muscles turn the ear of the Mammalia in all directions. In the Horse there are enumerated seventeen separate muscles, of which the depressor, adductor, and rotator, are in particular wanting in man. In many diving animals peculiar valve-shaped projections are found, by which the external meatus is closed and protected against the entrance of water; thus, for example, the narrow tortuous meatus of the Ornithorynchus has a valve externally, and in the Water-shrew the antitragus can close the external meatus at will. The external meatus is lined with a delicate skin, and contains the secretory sacs of the cerumen, which are not even wanting in the Cetacea. This last-named order presents further peculiarities, which here require notice. The tympanic cavity exhibits a very peculiar formation in the large sinuses, which are appended to it, and penetrate partly into bony cavities, which have been regarded as receptacles for large blood-vessels, but are in truth auditory sinuses, which extend partly into the cranial bones, and, partly enclosed by a peculiar smooth and shining membrane, stretch over them. The completely membranous and never cartilaginous Eustachian tube extends from a large membranous sinus, with which the bony tympanic cavity is continuous, inward and upward, to open upon the external side, very high up in the bony nasal cavity. The internal lining of this tube forms several crescentic valves, which can not however completely

close its cavity. Of the three ossicles, that which corresponds to the malleus is nearly triangular, departing very much from its usual form, and being provided with a long pointed process. The stapes has only a very fine opening, or is solid. The external meatus is not formed of bone, and is excessively narrow and tortuous. The external opening of the ear is so small, that it is scarcely visible.

#### *Organs of Smell.*

All Mammalia, with the exception of the Cetacea, have an ethmoid bone, often of great breadth, the cribriform plate perforated with numerous holes, and the ethmoidal labyrinth well developed. In the Apes the ethmoid is narrower than in Man, the crista galli is wanting (even in the Orang-utang), and it exhibits few openings. It is larger and very much perforated in the Pachydermata, the Ruminantia, and especially in the Carnivora. Of the three turbinated bones, the inferior is in particular frequently developed to a surprising degree, and consists of a pair of much convoluted laminae, as in the Ruminantia, some Rodentia and Pachydermata. Other Rodentia, as the Hare, Beaver, Squirrel, have more the complex structure of the Carnivora, in which the nasal cavity, though spacious in animals generally, is the largest of all. The turbinated bone is here divided into a number of jagged lateral laminae, so that, on a transverse section, it seems like a branching tree. The nasal sinuses are generally present, but exhibit great differences in the separate orders and genera, and are least developed in the Rodentia and Cetacea. The frontal sinuses are sometimes remarkably large, the wide intercommunicating bony cells penetrating even into the temporal and occipital bones, while in many animals, as the Marten, the Badger, the Rhinoceros, they are entirely wanting. In the Ruminantia they enter the frontal prominences upon which the horns are situated. The superior maxillary cavities are small in the Apes, and disappear entirely in the Carnivora, Edentata, and Rodentia; in the Pachydermata they are of moderate size; they are very large in the Horse, and in the Ruminantia. The sphenoidal sinus is enormously developed in the Elephant, and extends even into the alary processes of that bone; yet the frontal sinuses are here wanting. The nose is formed, as in Man, partly of cartilage; its muscles are often powerfully developed, and there is a special dilator. There is found very generally also, as in Birds, a peculiar nasal gland, which is, however,



frequently wanting; it always lies upon the external wall of the nasal cavity, and where there is an antrum, it is contained within the cavity, and its duct terminates at the anterior extremity of the inferior meatus. In animals provided with a snout, the nasal cartilages are lengthened out to a tube, which is covered with muscles that move it in many directions. Frequently, as in the Hog and the Mole, there lies near to the root and in the substance of the snout a peculiar bone. Internally the snout is divided into a double tube, and the whole structure is particularly remarkable in the Elephant, where it forms that highly developed organ of touch and prehension, the proboscis, which is lined internally with a dry epithelium; its two tubes are contracted in the vicinity of the intermaxillary bones, by which the ingress of water when sucked up is prevented; it consists of very numerous longitudinally arranged muscular bundles, with tendinous contracted portions, which, when they act, shorten the proboscis, while their antagonists are transverse or oblique bundles, imbedded in a net-work of adipose tissue. In all, there are reckoned about 30,000 to 40,000 bundles. Special elevators and depressors arise from the frontal and superior maxillary bones. In the Mole, there lie upon each side of the snout four muscles, which arise from the upper jaw, and are attached by their tendons to the nasal tube, like ropes to a mast. In many Cheiroptera, as *Rhinolophus*, *Phyllostoma*, peculiar appendages, partly cartilaginous, partly membranous, and of very singular forms, are developed upon the nose. Diving animals have occasionally valves by which the nasal passages can be closed internally, as in the *Ornithorynchus*, where the small round nasal openings lie at the base of the snout. The seals have an annular sphincter muscle round the nostrils. In the male of *Phoca cristata*, the *Cystophora borealis*, the nose is not developed into a snout, but presents itself as a large musculo-membranous bag, into which the animal can introduce air.

The nose of the Cetacea departs from the type of the rest of the Mammalia, and is developed into the blowing canal, while it takes a perpendicular direction, and terminates superiorly in front of the fore-head, as the blow-hole. The bony nasal cavity is therefore extremely simple. It consists, for example, in the Dolphin and in the Narwhal, of a simple smooth bony canal upon either side, without sinuses or turbinated bones. The nasal or spouting opening is single in the *Spermaceti* Whale, the Narwhal and the Dolphin; the Whales (*Balæna*) have two nasal openings, and

true ethmoidal cells appear to be met with here, which are wanting in the rest of the typical Whales.

In the Dolphins, the spouting apparatus has been accurately described. Behind the *velum palati* the inferior part of the nasal canal, which is here single, can be shut off from the pharynx by a strong circular muscle (*Musc. pharyngo-palatinus* v. *constrictor isthmi faucium superior*). Further, superiorly above and behind the bony palate, the nasal canal is as usual divided by a septum, and each of the two passages thus formed receives the Eustachian tube of its side, and terminates, as the external nasal aperture, upon the skull in front of the forehead. The blowing apparatus with its peculiar cavities here lies upon the bones. The nasal canal passes immediately into two anterior and two posterior cavities, lying one over the other; the covering of these is formed by a couple of projecting folds or valves, one arising from the anterior, one from the posterior wall, and which leave between them a narrow transverse fold. Above the valves there lies a simple flask-shaped cavity, the neck of which passes into the external blow-hole, which communicates upon either side in front and externally with the double capacious and rounded spouting sacs, each of which presents upon its basis strong parallel rib-shaped elevations (plications of its fibrous coat); all the parts of this external apparatus are lined with a hard, dry epithelium, and are formed of a thin fibrous tissue. The whole apparatus is surrounded by muscles which lie beneath the integument and fat, and form several layers which probably dilate the blow-hole.

#### *Organs of Taste.*

The tongue in the Mammalia, as in Man, serves as an instrument of taste; in relation, however, to size, form, structure, and development of epithelium, degree of mobility, &c., it exhibits great differences. In the true Cetacea it is but slightly moveable, flat, depressed, smooth and without gustatory papillæ; this is the case also in the Dugong and Sea-cow (*Manatus*). In many Edentata, *e. g.* *Myrmecophaga*, *Manis*, and such like, it is very long and vermiform, smooth and viscous. In the *Ornithorynchus* it is covered in front with large, hard, horny spines, behind with soft villi; in the Cats among the Carnivora, with very pointed horny spines, capable of tearing; among the Cheiroptera, at least in *Pteropus*, partly with similar trident-shaped corneous spines, as sheaths to the papillæ. Most animals have a soft tongue covered with papillæ, of which



the papillæ vallatæ, in number, position, and size, are subject to the greatest variations. In the Apes the tongue is most like the human organ; they have from 3—4—7 cup-shaped papillæ (p. circumvallatæ) ranged in the form of a triangle, or the letter Y; there are found mostly but 2 or 3, as in the Cheiroptera, in the Horse, Dog, and other Carnivora; sometimes, however, 10 or more occur. Great and interesting varieties are here exhibited, which have not been followed out so closely as they deserve, since they certainly stand in connexion with the sense of taste, and it is in the papillæ vallatæ that the glosso-pharyngeal nerve ramifies in particular. Further examples of such varieties may be here adduced. While in *Hyæna striata*, and *Viverra zibetha*, there are only two such papillæ upon the root of the tongue, and in the Cats, eight disposed in two rows, *e. g.* the Lyon and Lynx; there are found in *Ursus arctos* as many as 20 arranged in an arciform manner in two rows, the posterior of which is formed of smaller papillæ; 15 in one row are found in *Ursus Americanus*. Among the Rodentia, *Dasyprocta Aguti* has a pair of peculiarly large, much elongated papillæ. The Goat has 30, 15 upon each side, forming two rows; the Stag has 20 similarly disposed papillæ. The 10 to 12 papillæ vallatæ in the Camel, in which the papillæ filiformes also are very long and thick at their roots, are very singularly formed, being large and unequally notched like molar-teeth, and surrounded by a deep fossa. There rarely lies beneath the tongue a second accessory organ, as in the Bear, or sometimes even a third.

In addition to the tongue there occur in the Mammalia very peculiar organs, probably connected indirectly with the nutritive instincts, and thus with the sense of taste, and which combine the nasal with the oral cavity. These are the Stenonian ducts and Jacobson's organs, so called after their discoverers. The latter sometimes occur when the first are wanting; though the reverse is more frequently the case. The ducts of Steno are those canals, nearly filled with dense cellular tissue, lined with mucous membrane, and frequently surrounded by cartilaginous sheaths, which lie near to each other, separated by a partition in the intermaxillary bone, behind the incisive teeth; in the skeleton they pass out by the foramina incisiva, which coalesce in Man into a common hole. The naso-palatine nerve of Scarpa enters here, and ramifies upon the nasal septum and mucous membrane of the palate. The Jacobsonian organ is particularly developed in the Ruminantia, as in the Stag and Ox, where the trumpet-shaped tubes are above four inches long, and ex-

tend anteriorly over the Stenonian canals, to the posterior border of the vomer. The Carnivora and Rodentia have in part only the Stenonian canals, while even these are wanting in the Horse.

#### *Organs of Touch.*

The tips of the fingers are alone specially constructed as organs of touch in Man; still, many Apes, as *Cebus Azaræ*, possess a fine tactile sense in these parts. In the rest of the Mammalia, the upper lip, the nose, and snout, especially the bristles or vibrissæ seated upon the upper lip and at the angles of the mouth, the follicles of which often receive very large twigs from the infra-orbital branch of the fifth pair, serve chiefly as organs of touch. In the common Otter the vibrissæ of the angle of the mouth receive twigs from the alveolar branch of the third division of the fifth pair, and in the Seals, the numerous ramifications of the infra-orbital form an areolar plexus, before they enter the follicles of the hairs of the beard.

#### DIGESTIVE SYSTEM.

THE organs of mastication, namely, the *Teeth*, present in the Mammalia remarkable differences in number, form, and structure, which stand in such close relation with the whole economy, mode of life and form of the animal, that its place in the system can, as a rule, be determined from a few fragments of the teeth. In some genera of the lowest orders, *e. g.* *Manis*, *Myrmecophaga*, and *Echidna*, the teeth are completely wanting. In others, as in the Whales, their place is occupied by mere horny laminae, called whale-bone. The teeth occur invariably only in the intermaxillary upper and lower jaw-bones, and are generally implanted in sockets. As a rule, there are two sets of teeth, which succeed each other, the milk teeth and the permanent teeth, and these, as in Man, are divided into molar, canine, and incisor teeth, the first of these being the most universally present. Three kinds of teeth may be distinguished, 1st, Simple teeth, *dentes simplices*, in which the crown, as in man, is simply covered over with enamel. This is the case in the higher orders, the Apes, the Cheiroptera, Carnivora, Marsupialia, and many Rodentia, viz., the Mice, Marmots, &c. 2d, Enamel-folded teeth, *dentes complicati*, where the enamel is inflected into the dental substance, a form met with in many Rodentia, as *Myoxus*, *Castor*, and