

similar to those of a pigeon while feeding her young. The neck shortens and swells; the feathers are ruffled and the wings slightly open and shut, two or three times.

So far as my observations of the *Ceryle alcyon* extend, Mr. Darwin's remarks will not apply to that kingfisher.

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### A PETRIFIED FOREST IN THE LIBYAN DESERT

ON the western horizon of the Libyan Desert, as viewed from the summit of the Great Pyramid of Ghizeh, a conical hill stands in solitary grandeur, far removed from the route of desert travellers. This has long been supposed to be the ruins of a pyramid, yet nowhere is it recorded to have been visited by any but the Bedouin tribes who pass within a few miles of it, on the old caravan route to the Faïoom. It is enumerated by Lepsius as one of the Pyramids of Egypt, and in a recent work on the Great Pyramid\* it is called Dr. Leider's Pyramid, "until a better name be found for it," merely from its having been pointed out to the author by the late Dr. Leider of Cairo, who, however, had never visited it.

The following narrative of a visit to the eminence by Mr. Waynman Dixon, engineer, and Dr. Grant of Cairo, and of their discovery of a very remarkable petrified forest near its base, whose gigantic trees lie scattered about the desert in profusion, has been communicated to us by the former gentleman:—

Leaving the pyramids behind and lighted by the clear silvery moonlight, we set out into the desert by the caravan route to the Faïoom, leading up a solitary valley, in the rocks of which are cut ancient Egyptian tanks and mummy-pits. Presently we turn off from the regular track and take our way into the unfrequented desert, steering straight westward for the distant pyramidal hill. The sand of the desert is here hard and compact, and travelling easy, indeed, with the exception of one or two places where the sand is soft and heavy, a wheeled carriage might drive all the way, and to most travellers would be much preferable to camel or even donkey riding.

After many hours hard riding, we at last reach the top of a slight eminence, and across the wide valley in front of us is the place of our destination.

These long valleys, or "wadys," have much of interest about them; throughout may be seen the dry water-courses where the rare rain-showers carry down the sand into the bed, and leave all the little hills and eminences covered with flints as big as potatoes and with surfaces so brightly polished as to give the desert a silvery look by moonlight, or by day to cause the appearance of rippled water where they reflect the sunlight. The zoology and botany, too, of the desert are very interesting. There are numbers of the little "jerboa," a species of rat, with long hind legs and long tail with a tuft of hair at its end, which hops about like a kangaroo. Now and then may be seen a gazelle or two scampering off at the unusual sight of a caravan. A few small birds get a precarious existence, and in the sky an eagle or vulture sometimes wings its way. The insects are few, and the herbage is extremely scant, and it is a marvel what the animals live on. There are here and there in the water-courses small tufts of camel-thorn—a little shrub not unlike a whin, another with a coral-like growth, and now and then a handful of a tough wiry sort of grass, but what these again subsist on it is hard to say, for there is not a shower more than once or twice a year, and for nine months there is no dew while the heat of the sand at midday in summer is over 100 degrees.

Arrived at our destination before daybreak, we dis-

\* "Life and Work at the Great Pyramid," by Prof. Piazzi Smyth, F.R.S.

mount from our camels, and while the Bedouins are unloading the baggage, we hasten as fast as our legs, stiff with camel riding, will permit, up the heaps of sand and flints to the summit of the so-called Pyramid, to find on attaining it that it is but the conical end of a prism-shaped hill, stretching westward, and standing boldly out of the desert plain.

Near the top the rock crops out, and appears to be a species of friable sandstone fretted by the weather into curious shapes; but the actual summit is covered with flints and sand, and, what strikes one as being very strange, many fragments of petrified wood.

Taking a general survey from this quoin of vantage, we choose the best spot to the north of the hill to pitch our camp, exposed to the slight north wind which blows incessantly here, and descending its steep sides, at the bottom are surprised to find near the chosen spot three large stone trees lying prostrate on the sand. The largest is 51 ft. in length and 3 ft. 6 in. in diameter at its widest end, and 2 ft. at its smallest; they are branching exogenous trees, apparently a species of pine, and the one before us has the fork of a large branch very complete.

Wandering on up the wady to the north of the hill, named by us "Kôm el Khashob"—the hill of wood—we find the whole desert littered with fragments of petrified wood, from twigs the size of one's finger to pieces of large branches or trunks of trees; and on the flank of the hill to the north are hundreds of immense trees, lying half buried in the sand, some 70 ft. long, and in many instances with part of the bark still attached. All of them are exogenous trees—no single instance of a palm could we discover—and from the absence of roots it may be presumed have been drifted here by the sea. The stratum is apparently sandstone, overlying the limestone of the Nile valley; there are also here and there patches of a dark chocolate-coloured friable mineral with specks of green which looked like copper, but proved on subsequent analysis to be carbonate of iron; beds of what the Arabs call "Gyps" or gypsum, and nodules of an intensely hard black granulated looking stone—not unlike emery stone. The whole geological character suggesting the—possibly delusive—suspicion of the existence of coal under the surface.

Having carefully surveyed this neighbourhood we again climbed the "Kôm el Khashob," taking instruments to measure its height and determine its position; the former of which we found to be 752 ft. above the Nile level at Cairo, 602 ft. above the north-east socket of the Great Pyramid, and consequently about 140 ft. higher than its summit.

Having secured one or two sketches of the hill, and the sun being now near setting, we "fold up our tents like the Arabs and silently steal away." Mounting our camels again, and taking a slightly different route on our return, we pass some ancient solitary well-tombs away in the desert, but without mark or hieroglyphic inscription on them. All the way we notice fragments of petrified wood, and near to the pyramids extensive beds of oyster shells. This forest may almost be said to be a continuation—doubtless going much farther westward than we penetrated—of the well-known petrified forest in the Abbasieh Desert to the east of Cairo, which extends a long way in the direction of Suez, but is inferior both in extent and in the size and perfectness of the trees to that of the newly-discovered forest. The formation of the land here would lead to the supposition that it has been the ancient coast line, and that the trees drifted to where they are now found, and were then left in the briny waters of an evaporating sea or salt lake; and as the fibre of the wood decayed slowly away, the space of each cell has been filled up by the crystallising silica held in solution in the water.

Since the discovery of this forest it has been visited by many Europeans in Cairo, and English travellers, and to geologists especially it is well worthy of a visit. It may easily be reached from the Great Pyramid

either by donkey, camel, or horse, and is distant under three hours from it—a journey which in the winter may with comfort be accomplished in one day from Cairo. Indeed, if his Highness, the Khedive, who has done so much for the comfort of travellers in making a magnificent road to the pyramids, were to extend it for some half mile farther through the tract of soft sand, carriages could easily drive all the way to the Kôm el Khashob. The locality is now well known to the Pyramid Arabs, and most able and intelligent guides will be found in Ali Dobree, Omar, or others of this Bedouin tribe.

HUNTERIAN LECTURES BY PROF. FLOWER  
LECTURES VII. VIII. IX.

THE family Edentata includes the Bradypodidæ, Dasypodidæ, Myrmecophagidæ, Manidæ, and Orycteropodidæ, the first three being from the new world and the last two from the old. Considering them shortly, the Bradypodidæ are leaf-eaters; they have five molars above and four below, no other teeth being present, each tooth is a cylindroid column with a persistent pulp, and is surrounded externally by a harder layer, which causes the free surface to become cupped during wear. There is a peculiar descending process from the incomplete zygoma. The number of the vertebræ is great, their spinous and other processes are but little developed as the back is not much employed in supporting the body. There are extra articular surfaces on the lumbar vertebræ of the three-toed sloth, not found in the two-toed species. The clavicles are sometimes rudimentary, never complete. A bony arch joins the acromial process of the scapula to the coracoid, and the distal end of the clavicle in Bradypus is attached to the latter, a peculiarity which has been explained by Mr. Parker. The supra-spinous notch is converted into a foramen by a bony arch running over it, and there is a supra-condyloid foramen in the humerus of Cholopus only. Considerable rotation of the radius is possible; the hand is peculiarly modified, the fingers being bound together. It is generally stated that the trapezium is ankylosed to the scaphoid, which is very long, but that such is not the case is proved by the examination of the young animal; the trapezium, in fact, ankyloses with the first metacarpal bone. In Cholopus the second and third toes are only present. The ilia are broad, the femur short and with no ligamentum teres; some peculiar small bones are found round the knee. The tibia and fibula are firmly united, but not ankylosed; both genera have three toes on the hind foot. The inner surface of the fibular maleolus sends inwards a conical process, which acts as the pivot in which the externally cupped astragalus is hinged, and thus allows of a great range of movement of the foot. The peculiarities in the number of the cervical vertebræ are well known, no similar abnormalities are found in the fossil genera.

The other Edentata are not purely vegetable feeders; they eat ants and other animal food. In the Dasypodidæ the teeth are numerous, and the cervical vertebræ tend to ankylose together. As in the whole family the sternal ribs are ossified. The degree of development of the carapace is indicated by the size of the vertebral processes, and an extra series of articulations, as in the ant-eater and sloth, occurs in the lumbar region. In Myrmecophaga there are no teeth; the hind feet are quite normal, the front very peculiar, possessing five toes, and claws on the middle three. In the Old World forms, Manis and Orycteropus, there is no extra interlocking of the lumbar region, and in the former no teeth. Orycteropus possesses teeth, each of which may be said to be a compound tooth, each element of which has a persistent pulp.

Hitherto no true sloths have been found fossil in South America; they were then represented by the Gravigrada, which are so termed in contra-distinction to the Tardi-grada; they abound in the Pampas of Buenos Ayres, and are found as far north as the United States. *Megatherium* was the first of these large animals discovered, and the original skeleton, obtained in 1789, is now at Madrid. Since then several entire skeletons have been obtained, of which two very fine specimens are to be seen at the Museums of Turin and Milan. Those of the College and of the British Museum are partly from casts. Leidy has placed the North American animal in a distinct species (*M. mirabile*), on account of its geographical distribution, but he is unable to detect any osteological peculiarities. The only teeth in this animal are five molars with persistent pulps above, and four below on each side, as in Bradypus; and they form a continuous series. Each tooth has a double transverse ridge, the hollow of which fits the ridges in the opposite jaw. These ridges do not disappear as the animal gets old, but are permanent on account of the dentine not being uniform in density, the middle being softer than the sides, and therefore wearing away more readily. The teeth in the middle of the series are the largest. The skull is small considering the size of the animal, and the brain-case remarkably so. The brain itself, as known from a cast of the interior of the cranium by Prof. Gervais, closely resembles that of the sloths. The skull is very much elongated, the anterior condyloid foramina being large, it is probable that the tongue was so also. The palate was extremely narrow, and the premaxillary portion extensive. An enormous bony process descended from the zygoma which is also a peculiarity of the other members of the same family. The ramus of the lower jaw was immensely high. In the megatherium only is the molar portion of the mandible of unusual depth, and this is to hold the continually growing teeth. There are seven cervical, sixteen dorsal, three lumbar, five sacral, and eighteen caudal vertebræ; the lumbar, as in Myrmecophaga and Bradypus, possess interlocking processes; the whole column resembles that of the former of those animals more than the latter. The tail was strongly developed, and chevron bones existed on the neural surfaces of the caudal vertebræ. As several scutes were found with the bones of Megatherium, and as the different processes of the vertebræ were strong, it was at one time supposed that this animal possessed a shield, but there is no doubt that the scutes were those of Glyptodon, and the vertebræ do not resemble those of the Armadillo. The sternum was composed of seven pieces, and the clavicles large and well developed, being the only examples of these bones, which are bigger than those of man. As in the sloths, the acromion joined the coracoid, and the supraspinous foramen was strongly bridged over. In its distal limb segments the animal was peculiar. There was no supracondyloid foramen to the humerus; the radius and ulna were free; all the bones of the carpus were represented; the pollex was lost, and the other digits were present; the fourth and fifth metacarpals were elongated, the proximal phalanges very short, and the distal of the index, middle, and ring fingers constructed to carry huge claws, which differed from those of the cats in being flexed instead of extended when they were not in use, upon which depends the difference in the shape of their articular surfaces. The second and third phalanges of the middle finger were ankylosed, and a phalanx was missing in the fifth finger, which did not carry a nail. The pelvis presented the peculiarities of the sloths, and was very large. The femur had a small pit for the insertion of the ligamentum teres. The tibia and fibula were ankylosed at both ends. All the leg bones were massive. The foot was very peculiar, the animal must have rested on its outer edge. The os calcis was very large, with the calcareneal process going nearly as far backwards as the toes forwards. The