

remarkable change had taken place, or the details had not been properly made out on the previous morning—the head had become brighter, narrower, and longer, with a decided nucleus, situated a little less than half way from the following end; further examination showed a break in the line of light forming the head, a comparatively dark space splitting it in two, the nucleus being on the border of this space, while a brightening of the head near the other side of this space gave an appearance of another nucleus. The sketch for this date shows the position of these brighter parts or nuclei, and the space between.

A careful measurement at 17h. 41m. gives the pos. angle of the line of light forming head as $115^{\circ} 5'$. The distance of the nuclei was $11'' 5$, and the width of the head $10''$. On November 1, 17h. 18m., the pos. angle of head was $117^{\circ} 5'$, the breadth of the head $11''$, and the length $100''$, the general appearance being as that given for October 30, excepting that on this morning a brightening is recorded as observed at the extremity of the following part of the head, giving a tri-nuclear appearance. Subsequent observations made at intervals (on November 5, 8, 9, 10, and 17) show little deviation from the last sketch. Particular attention has not since been given to eye-observations, as the 3-foot has been used on these dates for photography (with doubtful advantage). The brightness of this comet is, as far as can be judged from a comparison of similar exposures, about the same as the great comet of 1881. One minute gives an image faint, but certain, about 25 minutes' exposure gives an intense image of the head and a trace of the tail; but the result is not at present worth the great trouble it causes. One of the November 9 plates shows the dark space in the head, and this is all that can be said for it; longer exposures without a proper means of following the motion of the comet give only a trail. This however I propose to get over by having motions adapted to the plate-holder and an eyepiece attached to the holder for the purpose of running a second image of the comet, taken out of the cone of rays from the speculum by another diagonal mirror properly placed for the purpose.

A. AINSLIE COMMON

Ealing, December 4

IN a clear sky at 4.50 a.m. November 26, not a vestige of the comet was to be seen by the naked eye, though its position was known exactly. On applying a telescope to the spot the nucleus appeared as a round nebula, with four small stars near it; as for the comet's tail, I presume it was "left behind," for no trace of it could be discerned, except by the eyes of the imagination. This is singularly corroborative of the statement that has appeared in these columns, viz. that the moonlight obscures the comet, although it seems to be doubted.

Oxford, December 5

FRANK STAPLETON

ILLUSTRATIONS OF NEW OR RARE ANIMALS IN THE ZOOLOGICAL SOCIETY'S LIVING COLLECTION¹

X.

26. **THE MALAYAN TAPIR** (*Tapirus indicus*).—In the present condition of zoological life on the world's surface there is no better instance of discontinuous distribution than that of the Tapirs. While Tropical America contains several species of *Tapirus*, and may be regarded as the focus of the genus, a single well-marked species—not, however, sufficiently distinct, even in the eyes of those most fond of inventing new names, for generic separation—occurs in Tropical Asia. This is the Malayan or Indian Tapir, *Tapirus indicus* (sive *malayanus*) of systematists.

The discovery of this Tapir in Sumatra, where it was first met with, though claimed by Cuvier for French natu-

ralists, is undoubtedly due to those of our own country. Marsden described the animal in his work on Sumatra as long ago as 1785, and Raffles obtained a knowledge of it in 1805. In 1818 a living example, captured near Bencoolen, was sent to the menagerie at Barrackpore, and was the subject of a drawing, forwarded to Cuvier by Diard and Duvaneel, which first made the great French philosopher acquainted with the existence of this animal.

The first example of the Malayan Tapir sent to Europe likewise came to this country. It was received in September, 1820, from Sir Stamford Raffles, and was the subject of an excellent memoir by the great surgeon and anatomist, Sir Everard Home, which was published in the *Philosophical Transactions* for 1821.

The Zoological Society of London acquired their first living specimen of this animal by purchase of Capt. Miland in September, 1840. This example died on April 17 in the following year. Although one or two specimens of the Indian Tapir passed through this country at subsequent intervals, it was not until the present year that the Society succeeded in obtaining possession of a second specimen. This was a young individual of the male sex, from which our illustration (Fig. 26) was taken by Mr. Smit in August last. It will be observed that although the large white area which covers the hinder quarters like a sheet, and renders the Indian Tapir so readily distinguishable from all its American brethren, is easily distinguishable in this drawing, the stripes and spots, which prevail in the younger dress of all the Tapirs, are still quite distinct. These disappear altogether when the animal is quite adult, leaving the entire body, with exception of the white back, of a glossy brownish black. The Indian Tapir is further distinguishable from all the American species by the absence of the mane, and by the minute structure of the teeth.¹ Unfortunately the Zoological Society's second specimen did not live to exhibit its adult characters, but died in October last in consequence of a disease of the rectum, which seems often to afflict these animals in captivity.

Besides Sumatra, where the Dutch naturalist, Salomon Müller, found it on the west coast up to a height of 2000 feet above the sea-level, the Malayan Tapir inhabits the interior of Borneo and the Malay Peninsula. There is also good evidence that a Tapir of some sort is found in the south-western provinces of China, which is probably of the same species.

In its native state the Indian Tapir is exclusively an inhabitant of the forest, keeping principally to the vicinity of the rivers and treading paths by following the same routes during its excursions from the banks in search of food. In captivity it becomes very tame and familiar. Dr. Cantor gives us the following account of a young female specimen which was captured in Keddah in 1845, and lived many months at his station in Malacca:—

"From the first, although fresh from its native wilds, this young Tapir showed a remarkably gentle disposition. The daytime it spent in sleeping in a dark recess of the portico of my house, though it would rouse itself if noticed. Towards sunset it became lively, would bathe, feed, saunter abroad, and with its lengthened nose examine objects in the way. Within a few days after its arrival it commenced to exhibit a marked partiality to the society of man, not indeed to its keeper in particular, whom it scarcely had discrimination enough to distinguish, but to anybody who happened to notice or caress it. Towards sunset it would follow a servant on the green in front of the house, and punctually imitate his movements, whether standing, walking, or running. If the man suddenly hid himself, the Tapir would hasten to the spot where it had lost sight of its keeper, look about in all directions, and if unsuccessful in discovering him, express its disappointment by a peculiar loud whistling. On the reappearance of the man, it expressed its pleasure

¹ Continued from vol. xxvi. p. 666.

¹ Cf. Tomes in *Proc. Zool. Soc.*, 1851, p. 121.

by rubbing its side against his legs, running between them, occasionally giving out a short singular sound, resembling that produced when the larger woodpeckers tap the trees, but more sonorous. When of an evening it heard the voices of people in the verandah above the portico, it exhibited strong marks of impatience till let

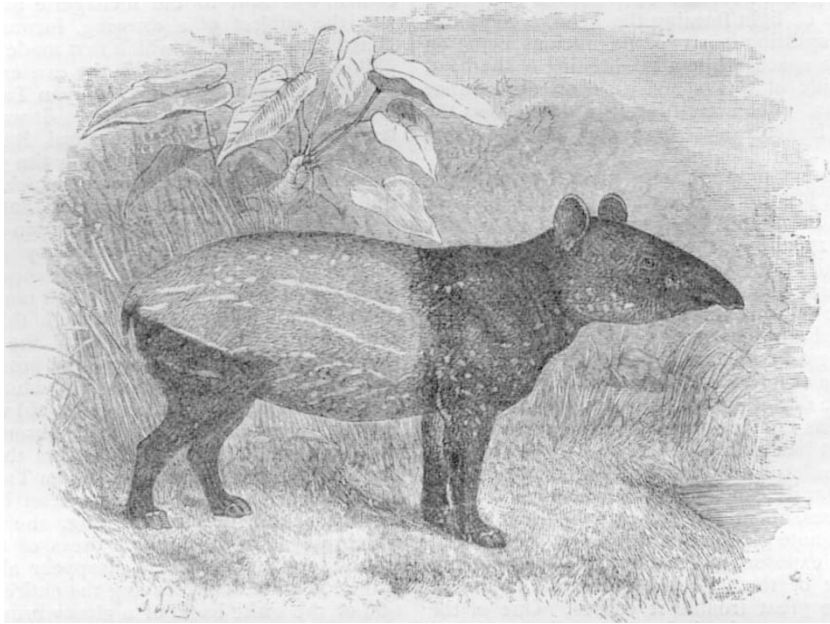


FIG. 26.—The Malayan Tapir.

loose, when of its own accord it would, awkwardly enough, ascend a flight of stairs leading to the verandah. It would then quietly lie down at their feet, and by stretching its limbs and shaking its head, express the

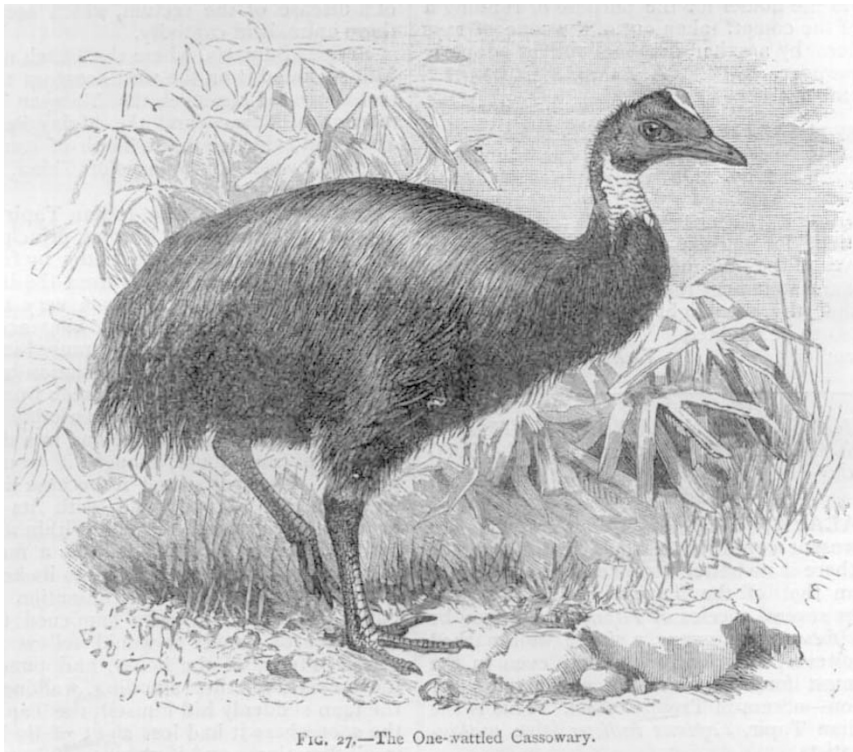


FIG. 27.—The One-wattled Cassowary.

satisfaction it derived from being caressed, and it was only by compulsion that it could be made to leave the company. Its food consisted of plantains, pine-apples | mangustins, jambu, leaves of *Ficus pipul*, sugar-cane, and boiled rice, of which latter it was particularly fond, if mixed with a little salt. Its drink was water and also

milk and cocoa-nut oil, which latter taste the Tapir possesses in common with the O'rang-utan. It delighted in bathing, and was otherwise cleanly.

27. THE ONE-WATTLED CASSOWARY (*Casuarius unappendiculatus*).—The Cassowaries of the Moluccas and Papuan Islands, together with the Emeu of Australia, constitute a very well-marked division of the Struthionies, or ostrich-like order of birds, and occupy a large area of the Australian region. But while the Emeu (*Dromæus*) is spread over the whole of the Australian continent, the Cassowary is only met with in the northern parts of Queensland and in the peninsula of Cape York, and we must cross Torres Straits into New Guinea and its adjoining islets before we arrive at the true metropolis of the Cassowaries. Here we shall find them scattered over the different islands to the number of nine, as indicated in Count Tommaso Salvadori's recent essay on the group,¹ and but one, or at most two species being ever found exactly within the same area.

A characteristic of the Cassowaries is the large horny

casque which covers the head, and is devoid of feathers. In one division of the genus this is much elevated and laterally compressed, in the other the casque is pyramidal in shape, and flattened cross-ways behind. The One-wattled Cassowary belongs to the second division, and is further distinguished by having (in common with its nearly *C. occipitalis*) but a single wattle in the middle of its throat.

This Cassowary was first made known to science in 1860 by Blyth, from an example brought alive to Calcutta, of which the exact origin was uncertain. It has, however, since been ascertained that it inhabits the Island of Salawatty, and adjacent western portions of New Guinea, where the naturalists Bernstein, v. Rosenberg, D'Albertis, and Beccari, who have visited these districts, have obtained specimens. Like other members of the group, it is a forest-hunting bird, living principally on various fruits, but also occasionally indulging in such animal food as lizards, fishes, and insects.

Our figure of this Cassowary (Fig. 27) is taken from a

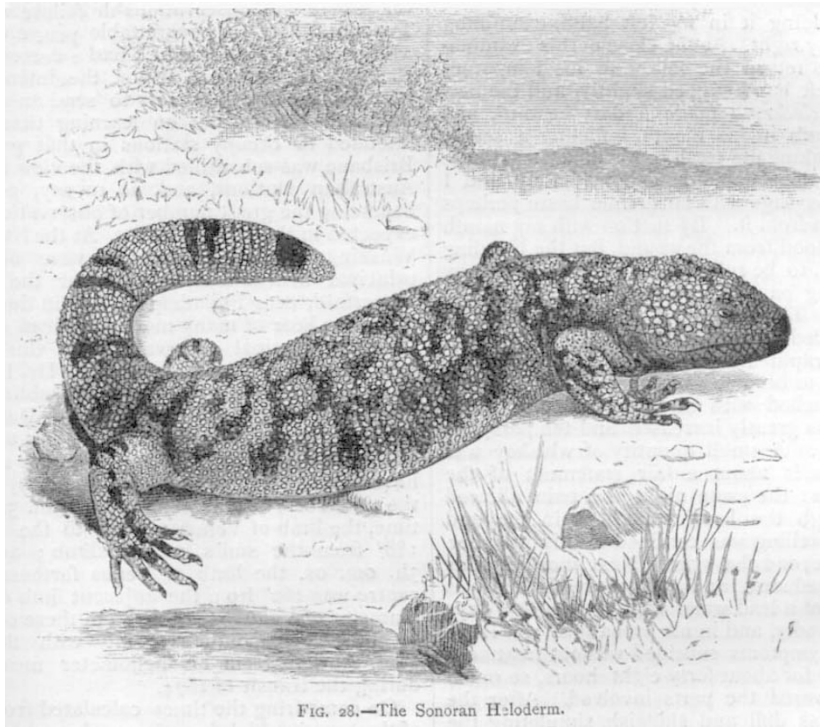


FIG. 28.—The Sonoran Heloderma.

nearly adult individual of this fine species, now living in the Zoological Society's Gardens, which was obtained by purchase in July last.

28. THE SONORAN HELODERM (*Heloderma suspectum*).—Lizards, as a general rule, are perfectly harmless animals, whose only object when approached is to get out of sight as fast as possible. In almost every country, it is true, some sorts of lizards have a dreadful reputation amongst the ignorant. The Slowworm, in England, and the Gecko, in India, are alike reputed to be highly venomous, but naturalists well know that there is not the slightest foundation for these fancies, and that both these little creatures are, in fact, quite innocuous. It was, in fact, until within a comparatively recent period, the generally received opinion among the best authorities, that no member of the Lacertilian order was really venomous. It is only within the last few years that the evil reputation which certain lizards of Mexico and the adjoining dis-

tricts of the United States have long borne among the natives of those countries, has been confirmed by an accurate examination of their teeth, and the conclusion thus forced upon us that at least one form of lizard is endowed with the faculty of producing a poisonous bite. The possessors of these formidable weapons of defence are the members of the genus *Heloderma* of naturalists, one species of which was long ago described from Mexico under the appropriate name *Heloderma horridum*. It has been shown by MM. Dumeril and Bocourt in France, and Dr. J. G. Fischer in Germany, that this lizard has not only grooved teeth, after the manner of many of the poisonous serpents, but likewise highly developed salivary glands, which issue at the bases of the teeth with the evident purpose of carrying the poisonous saliva into the grooves. It has been likewise shown by the evidence of careful observers that the bite of the *Heloderma horridum* is fatal to small mammals and birds, and highly injurious to man, although not perhaps under ordinary circumstances capable of inflicting a fatal wound.

¹ "Monographia del gen. Casuarius, Briss. Per Tommaso Salvadori," *Mem. R. Acc. Sc. di Torino*. Ser. ii. tom. xxxiv.

The same seems to be nearly the case with a second species of *Heloderma*, *H. suspectum* of Cope,¹ a portrait of which we give (Fig. 28) from a fine specimen recently added to the Zoological Society's collection. Experiments made with this animal have shown that it is sufficiently venomous to kill a small guinea-pig, and, as hereafter shown, there is no doubt that its bite inflicts serious injury upon any one handling it carelessly.

The Sonoran Heloderm, or "Gila Monster," as the inhabitants of Arizona call this reptile, is one of the largest lizards in North America, and is found all through New Mexico, Arizona, and Texas. It inhabits the sandy deserts of that arid land, and is said to be a wonderfully striking object as it darts about the rocks, and shows its brilliant armour of jet black and orange scales. In a recent number of the *American Naturalist*. Dr. Shufeldt gives the following account of his experiences with one of these "monsters":—

On the 18th inst., in company of Prof. Gill, of the Institution, I examined for the first time Dr. Burr's specimens of the Heloderm, then in a cage in the Herpetological Room. It was in capital health, and at first I handled it with great care, holding it in my left hand, examining special parts with my right. At the close of this examination I was about to return the fellow to his temporary quarters when my left hand slipped slightly, and the now highly indignant *Heloderma* made a dart forward, and seized my right thumb in his mouth, inflicting a severe lacerated wound, sinking the teeth in his upper maxilla to the very bone. He loosed his hold immediately, and I replaced him in his cage with far greater haste perhaps than I removed him from it. By suction with my mouth I drew out a little blood from the wound, but the bleeding soon ceased entirely, to be followed in a few moments by very severe shooting pains up my arm and down the corresponding side. The severity of these pains was so unexpected, that added to the nervous shock already experienced, and to a rapid swelling of the parts that now set in, it caused me to become so faint as to fall, and Dr. Gill's study was reached with no little difficulty. The action of the skin was greatly increased, and the perspiration flowed profusely. A small quantity of whiskey was administered. This is about a fair statement of the immediate symptoms: the same night the pain allowed of no rest, although the hand was kept in ice and laudanum, but the swelling was confined to this member alone, not passing beyond the wrist. Next morning this was considerably reduced, and further reduction was assisted by the use of a lead water wash. In a few days the wound healed kindly, and in all probability will leave no scar; all other symptoms subsided without treatment beyond the wearing, for about forty-eight hours, so much of a kid glove as covered the parts involved. After the bite our specimen was dull and sluggish, simulating the torpidity of the venomous serpent after it has inflicted its deadly wound, but it soon resumed its usual action and appearance, crawling in rather an awkward manner about its cage."

The specimen of the Sonoran Heloderm in the Zoological Society's Garden's Reptile House was presented to the collection in July last by Sir John Lubbock, Bart., F.Z.S., by whom it was received from Mr. G. A. Treadwell, of the Central Arizona Mining Company, of Vulture, in Arizona territory. There was much difficulty at first experienced in getting the reptile to take food. After articles of diet of various kinds had been presented to it, and successively refused, it was found that small hen's eggs were sufficiently attractive to induce it to break its fast. Since then the Heloderm has grown less dainty, and has actually condescended to take a small rat, though it prefers eggs to any other kind of food. It may be remarked that it is difficult to conjecture of what use venom can be to an egg-eating lizard.

Described in. *Proc. Acad. Sc. Phil.*, 1869, p. 5.

It may be added in conclusion that Dr. Steindachner, the well-known herpetologist of Vienna, has recently described and figured a new form of lizard from Borneo,¹ under the name *Lanthanotus borneensis*, which is nearly allied to *Heloderma*, and has similarly grooved teeth. It would be of great interest to know whether the Bornean lizard has likewise venomous qualities.

THE TRANSIT OF VENUS

A VERY fair amount of success appears from the telegrams to have attended the British expeditions for the observation of the late transit of Venus. In Jamaica Dr. Copeland and his colleague secured all four contacts; at Barbados Mr. Talmage, though he lost the first external contact, observed the other three; we have no intelligence yet from the station at Bermuda, occupied by Mr. Plummer, nor, of course, from the expedition on the west coast of Madagascar. At the Cape the observers were similarly favoured by the weather, and we hear of very successful observations in New Zealand by Colonel Tupman. The only regrettable failure was at Brisbane, whither Capt. Morris, R.E., had proceeded, with Mr. C. E. Peek. It had been at first the intention of the Committee of the Royal Society to send an expedition to the Falkland Islands, but on learning that other countries intended to occupy stations in that part of the globe, Brisbane was substituted with the view to strengthen the Australian stations, and, so to say, assist in counterbalancing the great number of observations that might be expected in the United States. At the Naval Observatory, Washington, all four contacts were observed with the principal instruments, as also at the Observatory of Haverford, near Philadelphia, and in due course we shall doubtless hear of many more American successes.

At the principal observatories in this country little or nothing was seen of the transit. Dr. Ball, so far as we are aware, was most successful at Dublin; though he did not secure either contact at 2h. 37m. Dublin time he was able to commence a series of measures of distance of the outer and inner limb of Venus from the sun's limb, which he continued to 3h. 3m. He found by calculation from the time observations that at 2h. 43m. 30s. Dublin mean time, the limb of Venus nearest to the sun's centre was 188" from the sun's nearest limb; and also, that at 3h. 0m. 0s. the limb of Venus furthest from the sun's centre was 162" from the adjacent limb of the sun. The diameter of Venus resulting from these observations is 64 seconds, corresponding exactly with that deduced by Prof. Auwers from his heliometer measures at Luxor, during the transit of 1874.

On comparing the times calculated from the elements of the transit which have been adopted in NATURE when referring to the phenomenon with those telegraphed to the *Times*, as having been noted by two observers at Washington, and one at Haverford, the following differences between calculation and observation are shown:—

	WASHINGTON.		HAVERFORD.
	Frisby.	Sampson.	
Contact I. ...	-80	+16	-41
" II. ...	+13	+3	+33
" III. ...	+21	-38	-29
" IV. ...	+80	+38	+19

Mr. Neison observed the first external contact at Durban at 3h. 54m. 41s. local mean time; if we assume his longitude to have been 2h. 3m. 30s. east, the difference of the calculated time would be -15s. The view from the observatory there was almost perfect. The conditions were, cloudless sky, but the air was unsteady.

Mr. Marth, writing on November 21, places his

¹ *Denkschr. k. Ak. Wien.*, xxxviii p. 95 (1878).