LETTERS TO THE EDITOR

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Bipedal Lizards.

I COMMUNICATED to NATURE, July 22, 1897, the intelligence that I had demonstrated by practical experiments that both the Australian Water Lizard (*Physignathus Lesouri*) and the Muricated Tree Lizard (*Amphibolurus muricatus*) shared with the Australian Frilled Lizard (*Chlamydosaurus kingi*) the singular faculty of running erect on its hind legs only. In that letter I refer to the as yet unconfirmed rumour that the Mexican Iguanoid Lizard (*Corythophanes Hernandezeyi*) also runs bipedally, and express the opinion that, judging from the close correspondence in general structure—more especially as regards the abnormal length of the hinder limbs—that exists between many of the American Iguanidæ and the Australian Agamidæ, it will probably be found that a corresponding bipedal mode of locomotion is shared by many allied members of the first-named family.

As a result of that communication and of a further ventilation of the subject in a paper recently read by me at the Royal Colonial Institute,¹ I have quite recently received an extensive and exceedingly interesting confirmation of my anticipations. Mr. Henry Prestoe, a twenty years' resident in the West Indies, writes me as follows:—"I have been struck by your remarks on the bipedal locomotion of the Frilled Lizard. It has occurred to me you would be glad to learn, if only in confirmation of your views, that with all the lizards—from the large Iguana,

FIG. 1.—Leseur's Water Lizard (*Physignathus Lesouri*), running erect.

which lives in trees chiefly and is about five feet long when full-grown, down to the smallest mite one sees occasionally about the stones, I have ever seen running, the method of hurried locomotion is *bipedal*. The most familiar example is the so-called Diamond Lizard, common in the pastures and pleasure-grounds of Trinidad, 18 to 24 inches long, including the tail. The attitude results, when the progress is over a muddy surface, in footprints exactly like those of a small fowl, going lightly, and accounted in my mind years ago for the occurrence of bird-like footprints much further down in geological strata than birds are known to have existed. The motion of the legs of the Diamond Lizard, when running, is so rapid as to render them for the time invisible. But in the case of the large Iguana the case is different, and it takes an effort to get up into the slanting position which the Diamond and smaller lizards assume at once. Meantime the action or "swing" of the behind feet is that of an ordinary duck—accentuated—remaining grotesque in fact so long as the more or less erect position is kept up."

Mr. Prestoe has informed me of the further interesting fact that there are many figures traced on the rocks about the watershed of the Guianas, certain of which unmistakably represent a lizard, such as the Diamond species, running on two legs. A figure Mr. Prestoe has supplied me with as a fair reproduction of one of the rock scratchings corresponds in a noteworthy manner with the silhouette-like representation of Leseur's Water-lizard obtained by myself when taking an instantaneous photograph of the animal in its most characteristic bipedal attitude.

¹ "Australian Natural History Gleanings." (*Journal of the Royal Colonial Institute*, January 1898.)

This phenomenon of bipedal locomotion, now shown to be common to many lizards that differ not only in their modes of life and widely separated habitats, but also in essential structural features, can scarcely fail to commend itself to the closer attention of the systematic biologist. When, as first reported by me, only a single species, *Chlamydosaurus kingi*, could be accredited with this remarkable mode of locomotion, it was interpreted as

FIG. 2.—Australian Muricated Tree Lizard (*Amphibolurus muricatus*), running erect.

most probably representing a habit that had been independently and recently acquired. Now, however, the demonstrated fact of its widespread occurrence is clearly indicative of its inheritance from a remoter ancestry with whom bipedal locomotion also constituted a common method of progression. The question is, who were they?

Apart from the foregoing considerations, I would suggest that the provision of conditions at our Zoological Gardens under which the many lizards possessing bipedal habits could exercise their singular but hitherto almost completely overlooked athletic accomplishments, would prove a great attraction to both naturalists and to the general public. Several varieties of these bipedal lizards are now on view in the Reptile House. They are at present, however, confined in relatively small cages, and, as I have demonstrated by practical experiments, it is essential for their display of bipedal locomotion that a level floor, with a free run of at least 20 or 30 feet, should be at their disposal.

Instantaneous photographs taken by me—but hitherto unpublished—illustrating characteristic attitudes assumed by *Physignathus Lesouri* and *Amphibolurus muricatus*, when running erect, are herewith reproduced.

W. SAVILLE-KENT.

The Glacial Period and the Irish Fauna.

MR. LAMPLUGH assumes (NATURE, January 13, p. 245) the correctness of the view that during the Glacial Period the basin of the Irish Sea was filled with an ice-sheet, and argues that my "interesting speculations" on the origin of the Irish fauna, in so far as they are based upon assumptions as to the glacial conditions of the Irish Sea, will therefore possibly not meet with much acceptance among geologists. That the Irish Sea, however, was filled with an ice-sheet during the Glacial Period is certainly not universally accepted among geologists. I think also, that it would have been more advantageous to us to hear Mr. Lamplugh's remarks, after having read in full my paper dealing with the origin of the Irish fauna, instead of the short abstract in NATURE. He would then have observed that I particularly avoided basing assumptions as to the origin of the Irish fauna on the glacial conditions of the Irish Sea. It has been rather too much the practice among some geologists of late, not only to assume the correctness of their theories as to the nature of the Glacial Period, but also to base thereon the probable course of events of the migrations of animals and plants. I have attempted, with a view to arriving at a more satisfactory conclusion on the origin of the British fauna, to found my deductions almost entirely on the presence in or absence from the British Islands of continental species. These conclusions are at variance with the views held by the, what we might call, extreme Glacial school of geologists.

In dealing with this subject, it seems to me, there is nothing gained in reiterating the same assumptions over and over again; and it really is immaterial whether the reindeer, the Irish elk, and dozens of other animals can or cannot cross ice. This does

not affect the British fauna as a whole very much. The bulk of the English and Irish animals *must* have travelled to these islands on a land-surface which was not covered by ice, and how they did so and when, is the problem at issue. To attack this problem from a purely zoological point of view will, I think, be of great service to geological science, and will help to clear up many doubtful points as to the nature and cause of the Glacial Period.

R. F. SCHARFF.

Science and Art Museum, Dublin, January 31.

I CAN assure Dr. Scharff that I took pains to read his full memoir before venturing to discuss it, as I think he should have recognised from the fact that the passage which I quoted from it did not occur in the abstract printed in NATURE.

I readily acknowledge my inability to discuss the purely zoological questions which he has raised, and purposely avoided any attempt to do so. But as his methods have led him to conclusions as to the past geological conditions of the Irish Sea basin which are demonstrably at variance with the geological field-evidence in a crucial area, it seems desirable that a geological protest should be recorded against them.

If Dr. Scharff could be persuaded to reconsider his subject from a standpoint which should include both the zoological and

THE TOTAL ECLIPSE OF THE SUN.

VIZIADURG, Monday, January 17.

THE work is so incessant here from sunrise to midnight that I have not time to give anything like an adequate idea of our doings. I may say, however, that we have been here since last Saturday week, and everything is ready for the eclipse. We have now over 120 volunteers. Captain Chisholm-Batten has taken charge of the whole arrangement, and to me, an old eclipser, it is a beautiful thing to see the splendid drill which we have commenced in eclipse form, along all lines, to-day, going on to the sound of the bugle. The observers have been arranged into twenty-one parties as follows:—

Observing Parties.

Instruments, &c.	Staff.
I. 6-inch prismatic camera	7
II. 9-inch prismatic camera	8
III. Integrating spectroscope	3
IV. Discs	18
V. Sketches of corona, without discs	12
VI. Colours of landscape	6

FIG. 1.—Camp, Saturday, January 8. Putting in concrete pillars.

the geological evidence, he might yet find some solution which would be satisfactory to the students of both sciences.

G. W. LAMPLUGH.

On Augury from Combat of Shell-fish.

In a foot-note to my letter on this subject (NATURE, vol. lvi. p. 30, May 13, 1897), I remarked that the *Khchau* (a shell-fish), applied by the Cambodians to the divination of a war, is likely to belong to the family of Paludinidae, taking into consideration the fact that the Japanese and the Chinese of former days used some species of viviparus (= Paludina) for the same purpose. Lately, while examining M. A. Parvie's article "Excursions dans le Cambodge, &c." in *Cochin-Chine Française; Excursions et Reconnaissances*, No. 9, p. 479, 1882, I have come across a passage giving confirmation to my view. The author, giving nomenclatures of the Cambodian molluscs, identifies the native *Kechau* (which is doubtless another French form of the spelling *Khchau*) with the Latin "Paludina"; whereas the allied genus *Ampullaria* has its Cambodian name "Tal."

KUMAGUSU MINAKATA.

January 31.

NO. 1476, VOL. 57]

VII. Shadow phenomena	8
VIII. 6-inch equatorial, with grating spectroscope	5
IX. 3½-inch equatorial	3
X. Hand spectroscopes, with slits	6
XI. Prisms for observations of ring spectra	7
XII. Timekeepers	3
XIII. Contact observations	2
XIV. Polariscope	2
XV. Observations of temperature	13
XVI. Observations of stars during totality	7
XVII. Landscape cameras for shadow, &c.	7
XVIII. Observations of shadow bands	3
XIX. Kinematograph for eclipse	4
XX. Kinematograph for shadow	2
XXI. Coronagraph	3

Total 129

Incessant instruction has been going on since the eclipse party joined the *Melpomene* at Colombo; but in this I have had quite a subordinate part to play, for the officers are past masters in many of the subjects which concern