theory is certain to form the basis of a careful and complete series of investigations, not only in Europe, but also in those regions in Africa and America where pellagra also occurs, these experiments and results on the destruction of the Simulium larvæ will be of no little practical importance in the prophylaxis of the disease, whether a definite pathogenic organism is discovered, or the case proves to be analogous to that of Stegomyia or yellow fever.

C. GORDON HEWITT.

Division of Entomology, Ottawa, November 21.

The Song of the Siamang Gibbon.

THE Zoological Society has recently received on loan an almost adult example of the siamang (*Symphalangus syndactylus*); and since I can find no adequate description of the voice of this ape in the books I have consulted, I think the following description may be interesting to readers of NATURE.

The siamang differs from all other gibbons in having a pair of laryngeal vocal sacs visible externally on the throat as an undivided pouch of loose skin. When the animal is in full song the pouch becomes inflated into an immense oblate spheroid much wider from side to side than from above downwards, and comparable in size to the entire head of the gibbon. A feeble imitation can be made of the booming that comes from this pouch by uttering a guttural monosyllabic "*ooo*" with cheeks inflated and lips compressed. It is not unlike the sound produced by a large bubble of air bursting on the surface of water confined in a narrow space like a rain-water pipe. In addition to this there are two very distinct cries apparently quite independent of the vocal sac and uttered with the mouth open. One is a shrill, piercing bark, like the monosyllable "*haow*," cut off sharply by the abrupt closing of the lips. The other is a prolonged, unearthly wailing shriek—"*ahh—o*"—resembling more than any familiar sound to which I can compare it the "*miaou*" of a cat multiplied ten times in volume. It starts on a high pitched note with the mouth widely astretch, and gradually descends the scale as the jaws are closed. There are two variations of this shriek, one being a note or two higher and more piercing than the other.

The song usually begins with a low and gentle booming punctuated by an occasional staccato bark. As the excitement rises the ape starts to move, and swings round the cage barking vigorously and repeatedly, and now and again uttering the wailing shriek, the loud booming from the now fully expanded vocal sac going on all the while like a resonant bass accompaniment. The noise is deafening and terrific, and I shall not easily forget the consternation of the chimpanzees and the look of mild surprise that pervaded the usually expressionless faces of the orang-utans when they heard it for the first time in the apes' house.

The voices of Mammalia have never, I believe, been carefully studied and compared; yet they are worthy of the closest attention as a criterion of specific relationships. The cry of the siamang, for instance, is quite different from that of the Hainan, Hoolock, and Wau-wau gibbons, and each of these species has its characteristic song. I have elsewhere pointed out that the bray of Grévy's zebra betrays pronounced asinine affinities, and equally forcibly attests remoteness of kinship between that species and the quaggine Equidæ; that the likeness between the roar of the lion and the tiger on one hand and of the jaguar and the leopard on the other confirms the conclusion that these species are respectively closely allied, and that these four great cats form, with the probable inclusion of the ounce, a special group of Felis characterised by a roaring voice correlated with a peculiarly modified hyoidean apparatus; that the friendly purr practised by the puma, cheetah, caracal, common cat, and other species which, be it noted, never roar, distinguishes them from lions, tigers, and leopards, which never purr. To the casual observer the Cape hunting dog (Lycaon) is more like a hyæna than a wolf, but the moment he barks and growls it is needless to look at his teeth and skull to detect his cousinship to Canis; and I have recently noticed identity in all essential respects between the raucous growl of a frightened cervine wallaroo (Macropus) and that of a nervous Tasmanian wolf (Thylacinus). In this last instance we have vocal likeness associated with deep-seated ordinal resemblances, and apparently persisting despite great divergences in other structural features and in habits.

Zoological Society. R. I. POCOCK.

On the Simultaneity of "Abruptly-beginning" Magnetic Storms.

IN the first number of *Terrestrial Magnetism and Atmospheric Electricity* for the present year, Dr. Bauer has written two papers, in which he believes he can prove the following (p. 20):—

"Magnetic storms do not begin at precisely the same instant all over the earth. The abruptly beginning ones, in which the effects are in general small, are propagated over the earth more often eastwardly, though also at times westwardly, at a speed of about 7000 miles per minute, so that a complete circuit of the earth would be made in $3\frac{1}{2}$ or 4 minutes."

Dr. Bauer bases this result upon an investigation of two magnetic storms of Birkeland's "positive equatorial" type, namely, the storms of May 8, 1902, and January 26, 1903. In the latter he makes use of a table in Birkeland's "The Norwegian Aurora Polaris Expedition, 1902–3."

In the following number Dr. Faris made a more thorough investigation of this circumstance, taking fifteen different abruptly beginning storms, recorded at the Coast and Geodetic Survey magnetic observatories, in which he considers that he found Dr. Bauer's result confirmed.

Upon this foundation Bauer then develops the "Ionic Theory of Magnetic Disturbances" (*loc. cit.*, p. 111), of which the principal advantage over Birkeland's corpuscular theory is supposed to consist in the being able to give a natural explanation to time differences such as these, which Birkeland's theory, in his opinion, cannot do.

Notices of these papers appeared in NATURE of August 11.

As it appears that a number of the perturbations described by Dr. Faris are some that I studied last summer when making an investigation of magnetic equatorial storms at the magnetic observatory in Potsdam, a comparison may be of some interest. I determined also the time of the commencement of a number of positive equatorial storms as accurately as possible for another purpose, and without any knowledge of Dr. Faris's work, so that the measuring of the time was entirely independent of it, a circumstance which may be worthy of note.

It may be remarked with regard to the exactness with which the time can be determined by the Potsdam curves that the length of an hour upon the magnetograms is about 20 mm., and that thus one minute answers to about $\frac{1}{3}$ mm. If we then take into consideration all the errors that may creep in because the curves, the time-marks, and the points considered are not so sharply defined as might be wished, and further all the errors that may be due to changes in the paper in developing, owing to the fact that the paper has perhaps not laid quite straight on the roller, &c., it will be evident that where there are no exact automatic time-marks upon the curve itself, one minute will at any rate be the *lowest* limit for the accuracy that under favourable conditions can be counted upon.

There might very easily be an uncertainty of several minutes if, for instance, the base-line is not exactly straight, but is slightly curved, if the parallax cannot be determined exactly, and so forth. Unfortunately, neither Dr. Bauer nor Dr. Faris has stated anything as to how the time in the various cases can be given exactly, a point upon which, it would be thought, it was highly important to be clear.

In the equatorial storms that I have studied, and especially those that are also found in Dr. Faris's Table I. (*loc. cit.*, p. 101), the point at which they commenced is especially clear in H. The deflections in D and Z, on the other hand, are very slight, and in consequence the beginning there is far less clearly defined.

It is therefore the beginning in H that is especially suitable for employment in a comparison such as this, and this was what I especially investigated. It will *a priori* be perceived that the results obtained by employing the other two components must be far more uncertain. In the table below I have compared the means of the values found by Faris for the five American stations that he has considered with those I measured out by the aid of the