induction of each section of the armature, a certain amount of energy is used twice in each revolution to establish the current in it. *This energy is lost* so far as the external circuit or the effective output of the machine is concerned" (the italics are ours). This sentence shows that the author has never attempted to study the extremely complicated problem of commutation; it would, therefore, have been wiser to say nothing about it in an elementary text-book.

But we must stop, though we have by no means exhausted the various errors which mar the book. We have noted a few quite as glaring as those which have been adduced as samples. The book possesses some good features, notably the attempt to explain everything by considering the stresses in the medium; but it is so full of error that we feel bound to condemn it very strongly.

A. H.

Die Lehre vom Skelet des Menschen unter besonderer Berücksichtigung entwicklungsgeschichtlicher und vergleichend-anatomischer Gesichtspunkte und der Erfordernisse des anthropologischen Unterrichtes an höheren Lehranstalten. Bearbeitet von Dr. F. Frenkel. Pp. vi + 176. Mit 81 textfiguren. (Jena: Gustav Fischer, 1900.)

THE author has in course of publication, for use in the Gymnasias and Realschulen, a series of wall plates in which the anatomy of the human body is represented, and he has prepared the book now under consideration as a supplement to the plates which illustrate the skeleton. He devotes 176 pages to the description of the human skeleton, and includes an account of the joints which connect the bones with each other. He has adopted as the basis of his arrangement the plan followed by Gegenbaur in the "Lehrbuch der Anatomie der Menschen."

In the course of his description, Dr. Frenkel takes the opportunity of calling attention to the developmental changes which take place in the præ-ossific stage of the skeleton, as well as during the process of ossification itself, more especially in their bearing on the production of variations which, from time to time, come under the notice of anatomists. He contributes an interesting chapter on the variations in the number of vertebrae, more especially in the thoracic, lumbar and sacral regions, and explains the occasional occurrence in the dorsi-lumbar region of a vertebra which partakes partly of the characters of both these groups, and in the lumbosacral region of a vertebra which exhibits a transitional form between the lumbar and sacral series.

The opportunity is taken, from time to time, to point out the differences in arrangement and character between the human skeleton and that of the anthropoid apes, though in this respect many additional examples might readily have been given. It is, of course, impossible in a work of this kind to free the descriptions from technical terms and modes of expression; but the author, taking into consideration the class of readers for whom it has been written, has explained the meaning of the terms and, as far as practicable, has couched his descriptions in language to be readily apprehended.

De Paris aux Mines d'Or de l'Australie occidentale. By O. Chemin. Pp. 370 + 2 maps. (Paris: Gauthier-Villars, 1900.)

A DESCRIPTION of Western Australia from the mining point of view, illustrated with pictures characteristic of the scenes presented in a journey from Paris to Perth, and examined during short visits to other places in our premier gold-producing colony. The geography, population, government, mineral resources and gold fields of the colony are surveyed, and the condition and promise of individual mines commented upon. The author spent nearly a year in Westralia, and his book will direct the attention of his countrymen to an immense region, much of which is still little known.

NO. 1636, VOL. 63]

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Malaria and Mosquitoes.

INTERESTING letters by Mr. D. E. Hutchins and Mr. F. R. Mallet have recently appeared in NATURE, suggesting the possibility of there being some other route for infection in malaria besides that by the bite of Anopheles. Suggestions of this kind always appear to me to give rise to the questions, (a) whether the facts are really as stated? and (b) whether, if even this is the case, they cannot be explained by the mosquito theory? The notion that clearing jungle causes fever is very widely spread; but this does not prove that it is true. Granting that it is true, it may possibly be explained on the ground (a) that persons engaged in clearing jungle and laying out new plantations are not likely to be so well housed as those who live in established settlements; (b) that any hard labour encourages relapses of fever among coolies and others who have already been infected; and (c) that, as shown by Christophers and Stephens, jungle often contains large numbers of Anopheles. The frequent statements one sees, to the effect that malaria has prevailed largely when mosquitoes were few, are generally too vague to be of value, because it is not added whether the cases were relapses or fresh infections, or to what kind the "few" mosquitoes present belonged. When a man says that mosquitoes are numerous he generally refers to the genus Culex, which probably assert themselves more than do Anopheles. The idea that the water of the rivers of western India can cause fever when it is drunk is certainly opposed to my personal experience. In 1891 I went fishing with Mr. G. Tait, of Bangalore, in the River Bhawani, near Ootacamund. I remember that at the time I did not think that fever could be acquired by drinking such water, and I used daily to drink the unboiled water of this river (which flows amongst thick jungle). I remained quite free from fever, without taking quinine; but Mr. Tait was afterwards attacked. So far as I remember (but I am not sure), he had refused to drink Bhawani water; but I am not certain that his fever was malarial. Again, the idea that malaria is absent in the Nilgiri Hills round Ootacamund unless the soil is turned does not accord with my personal experiences. I acquired fever at Kalhutti (5000 feet above sea-level) in 1897, when I was investigating the disease in the Sigur Ghat. I thought at the time that I had acquired it in the plains below, but, in the light of our present knowledge, have little doubt that I became infected in the dak-bungalow at Kalhutti, where a succession of kitmutgars and their families had been taken ill. I noted particularly at the time that there was no freshly turned soil in the neighbourhood of the bungalow. Lastly, the case mentioned by Mr. D. E. Hutchins, namely that of a medically authenticated case of malaria being produced by fresh earth carried past a window in baskets by coolies, seems to me to be open to criticism. Which fact was medically authenticated—the fact that the patient suffered from malaria, or that his malaria was caused by the earth carried past in baskets? I can understand the first fact being certified by a doctor, but scarcely the second. How did the doctor prove that the fever was produced by the earth in the baskets? It seems to me that the only way in which he could have done so in a trustworthy and scientific manner would have been to infect a second person by having the baskets carried past a second time. I doubt whether such instances—and we see hundreds of them in the Press—will bear close examination. Those who cite cases of fever apparently due to freshly-turned earth, seem to forget that there are millions of people constantly engaged in digging without suffering from the disease more than others do.

Liverpool, February 25.

R. ROSS.

Abundance of Peripatus in Jamaica.

MR. P. H. GOSSE in the "Naturalist's Sojourn in Jamaica" (p. 66) makes the first reference to the occurrence of Peripatus in Jamaica, having found in 1845 five or six specimens near Bluefields, on the south-west coast of the island. Gosse regarded them as "rather allied to the Annelida than to the Mollusca." No further mention of the animal is made until it was rediscovered at Bath in 1892, nearly fifty years after, by a local naturalist, Mrs. Swainson. Seven Peripatus were sent to

the museum of the Institute of Jamaica, and later were briefly described by Messrs. Graham and Cockerell in *NATURE* (1892, p. 514), when the specific term *Jamaicensis* was suggested. The year following over a dozen specimens were received by Dr. Graham, also from Bath. The locality is in a most humid part of the eastern extremity of the island. Two or three examples have since been secured from widely separated spots, but the species has hitherto been regarded as one of much rarity, and as uncertain in its distribution. Various attempts made by different collectors to secure specimens have been unsuccessful.

Prof. E. L. Bouvier, who has lately been making a systematic study of the genus, recognises two species—*P. jamaicensis* and *P. juliformis* var. *Gossei*—among the Jamaica representatives, (cf. *Quart. Jour. Micr. Sci.*, vol. xliii. p. 750). Prof. Ray Lankester, on behalf of Prof. Bouvier, has recently communicated with the Institute of Jamaica asking for additional specimens. A general description of *Peripatus* was accordingly inserted in the local newspapers, and offers of reward were made with the object of encouraging the peasantry to search for the animal, but this was of no avail. A visit, since made by the writer, to Bath resulted in the securing of a number of examples. These were exhibited in the neighbourhood and a sum was offered for further specimens, with the result that before long numbers began to pour in and soon upwards of fifty were obtained. Dr. Graham also secured a large supply. Afterwards more than eighty specimens were dispatched to the Museum, then another fifty were offered, and now that a local enthusiasm has been created it would seem that examples in plenty might be procured at any time. It is thus obvious that the animal is by no means so rare as has been supposed.

The creatures are found under stones and rotten wood, often buried for a short distance in the earth. Most are blackish brown or green, much lighter on the ventral surface; others are reddish black above and light flesh-coloured beneath; but many intermediate tints occur. A reddish-brown colour is extracted at first by alcohol, and the distinctive colours are soon lost. Specimens of all sizes were obtained, including individuals in which parturition took place during preservation. The length of the newly born was as much as 2 cm. J. E. DUERDEN.

Institute of Jamaica, Kingston, February 12.

Audibility of the Sound of Firing on February 1.

FROM the letters written to *NATURE* and to the *Standard* by correspondents who heard at very great distances the guns fired at Portsmouth on February 1, it seems to be the general impression that the firing was by volleys, if one may use a convenient but probably technically incorrect expression. This was not the case. It would be very desirable that the official order of firing should be published. If this is not done, there may be some interest in a note on the order as it appeared to me, watching from the sea-front near Southsea Castle.

The disposition of the fleet was roughly thus:

	Channel Squadron.	SOUTHSEA
Reserve Squadron.	* Flagship.	
	Foreign ships.	

OSBORNE.

The first gun of each round of firing seemed to me to be fired far down the line, from the flagship of the Reserve Squadron; but of this I cannot be sure. It was immediately succeeded by the gun from the *Majestic*, flagship of the Channel Squadron; and from this the firing ran down the double line, the intervals between the successive pairs of flashes being about half a second. It was impossible to see from Southsea whether the Reserve Squadron followed the lead of the Channel Squadron or of its own flagship. In the latter case, after the leading guns from the flagships there would have been four guns, in the former case two guns every half second, for a space of some seconds.

These details are from memory, and may require some correction. The important fact is that the guns were fired in quick succession, and not simultaneously.

The line of ships was about eight miles long, roughly east and west, and Southsea was about a mile north of the eastern end. But the roll of the guns lasted only about twenty seconds—that is to say, scarcely any sound reached us from the western division of the line, which was hidden from sight by a projecting

point of land. It is not surprising, therefore, that nothing was heard at Chichester and other places comparatively near Portsmouth.

ARTHUR R. HINKS.

Cambridge, February 26.

Protective Markings in Animals.

I ENCLOSE a photograph of my cat asleep, in which may be plainly seen the resemblance to open eyes, borne by the markings above the orbits. In the living cat this resemblance is so striking that my attention was first drawn to it by my fancying that he was sleeping with his eyes open.

I have noticed the same markings in other cats, but never quite so distinct. The advantages, to a non-domesticated animal, of such an arrangement are obvious, and I think it may interest some of your readers. Besides these marks over the eyes, I observe in a good many cats that the fur on the lower jaw is generally light and bounded by markings following the line of the mouth, thus giving a heightened effect when open, whilst when shut, during sleep, the cat has, at a distance, the appearance of having the mouth still open.

CLARENCE WATERER.

Highfield, Northdown Avenue, Margate, February 26.

Snow Crystals.

A FALL of snow stars, similar to that described by Mr. Wm. Gee (p. 420), occurred near Sutton Coldfield about 1876, as near as I can remember. I was much struck by their beauty and the graceful way they fell to the earth.

C. J. WOODWARD.

Municipal Technical School, Birmingham, March 2.

THE NEW STAR IN PERSEUS.¹

DR. COPELAND was kind enough to inform me by telegram, on the afternoon of February 22, of the discovery by Dr. Anderson of a new star in the Milky Way in Perseus on the early morning of that day. It was stated that its position was R.A. 3h. 24m. 25s. and Declination +43° 34', its magnitude 2.7, and colour of a bluish-white. Later in the evening this information was corroborated by another telegram from the "Centralstelle" at Kiel.

Owing to cloudy weather, no photographs could be obtained at Kensington until the evening of the 25th. Momentary glimpses of the star on the evening of the 22nd, between the hours of 6 and 7.30 p.m., indicated that the Nova had considerably brightened since the time of its discovery, as it was estimated as a little brighter than a first magnitude star; no satisfactory observations of the spectrum could be made.

Another glimpse on the early morning (1.30 a.m.) of Monday (25th) showed that the star was still of about the first magnitude.

Prof. Pickering reports that the Nova was dimmer than an eleventh magnitude star on February 19. On the 23rd it was as bright as Capella.

The star, therefore, was then at least 10,000 times brighter than it was four days previously, and ranks as the brightest new star recorded since that which appeared in the year 1604.

Since the 25th the brightness has diminished slightly, and on the evening of the 27th was estimated between the first and second magnitude (1.7). If this reduction of brilliancy continues at the same rate, the new star will evidently be shorter lived than those to which it has most closely approximated in luminous intensity at the maximum, and less time will be available for studying the spectral changes which may be anticipated. I may state that Tycho's Nova (1572) was visible for nearly one and a half years, and Kepler's (1604) for about the same period.

It is interesting to note that the star was described by Dr. Anderson as being of a bluish-white colour at the

¹ Preliminary note. By Sir Norman Lockyer, K.C.B., F.R.S. Received and read before the Royal Society, February 28.