LETTERS TO THE EDITOR.

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Kites and Wireless Telegraphy.

IN view of the current report in the daily Press that Mr. Marconi has succeeded in receiving at St. John's, Newfoundland, by means of a wire raised with a kite, signals sent from his station at Poldhu, Cornwall, it may be interesting to recall that kites were used here during the summer of 1899 in some similar experiments. In the "Report of S. P. Langley, Secretary of the Smithsonian Institution, for the Year ending June 30, 1900," it is stated on p. 10: "In addition to the above investigations a Hodgkins grant has been approved to enable Mr. Rotch to carry on a series of experiments in space telegraphy, it being thought that the unprecedented heights attained by kites might materially extend the range of communication by this method. In the preliminary experiments, however, kites were not used, sufficient elevation being attainable without them, but when the difference between the stations was increased from one mile to three, kites were employed to raise the transmitting and receiving wires. In the later experiments it was found, not unexpectedly, that the long wires, carried up and supported by kites, collected so much electricity as to interfere with and greatly complicate the messages sent from station to station. These interruptions seem to show that the limit of elevation for the receiving wire was under these conditions less than five hundred feet. The greatest distance covered in the experiments was approximately twelve miles, from a wire supported by a kite about two hundred feet above Blue Hill to the tower of Memorial Hall in Cambridge, which was used as the receiving station. These experiments draw attention to the fact that electrification increases with the altitude to which the wire is carried, and that it is always present, although varying with the meteorological condition of the atmosphere. The experiments were discontinued in the autumn of 1899."

If Mr. Marconi, by his system, has really received signals from across the Atlantic, with the receiving wire lifted by a kite to an altitude exceeding five hundred feet, it would appear from my experiments that he must have employed some hitherto unknown method of shunting out atmospheric electricity.

A. LAWRENCE ROTCH.

Blue Hill Meteorological Observatory,
Mass, U.S.A., December 17, 1901.

Poisonous Molluscs.

I NOTICE that doubt is cast on the opinion held by some authorities that the bite of certain species of Conus is poisonous; and as a case has now occurred here in a European subject whose intelligence places her account of it beyond question, I think it may be useful to represent the corroborative evidence thus obtained.

I should mention, first, that a shell exactly similar to the one in question was forwarded to the Australian Museum, Sydney, and that I am indebted to Mr. Etheridge, the curator, for information on the point and for the identification of the specimen as the shell of *Conus geographicus*.

The patient, Mrs. B., was fishing from a boat after dark in the harbour of Levuka (Fiji), and one of the crew handed her a mollusc he had picked up in shallow water at low tide while getting bait—a *C. geographicus*. Mrs. B., being an old resident in the islands, proceeded to evulse the mollusc with her little finger, the boy having cracked the shell to facilitate this procedure. While doing so she received a puncture, and shortly afterwards felt her hand and fore-arm becoming numb. The effect quickly extended to the shoulder, and the patient had to return to the shore and be conveyed home. In an hour or so she was in great distress, speechless, and paralysed in most of the voluntary muscles; a condition which later became intensified and alarming, although the cardiac and respiratory muscles showed no evidence of flagging. The medical man who attended Mrs. B. likened her condition to that which might be looked for after poisoning by *curare*.

The puncture was so slight as to be scarcely discernible; after two days a steady but slow recovery took place, and a fatal termination was averted.

During this time the patient did not lose consciousness; but there was for a while some confusion of ideas, and, chiefly in consequence of the loss of power in the muscles concerned in articulation, she was unable to speak intelligibly, although she subsequently asserted that she knew quite well what was going on around her. She underwent an attack of conjunctivitis a few days later, which she connects with the occurrence; but it is doubtful whether she is right or not in so believing.

R. GLANVILL CORNEY.

Medical Department, Fiji, September 30, 1901.

The Distance of Nova Persei.

IT appears to me that the phenomenon of the apparent expansion of the nebula surrounding Nova Persei would be simply explained by referring it to the illumination of meteoric matter by the light sent out on the occasion of the outburst of the Nova. On this hypothesis it becomes possible to calculate the distance from the earth by means of the observed angular growth of the illuminated ring which must spread out with the velocity of light. This gives 313 light-years as the distance.

Daramona. W. E. WILSON.

Colours of Butterflies not due to Diffraction.

SOME time ago your correspondent, Mr. Benham, corrected the mistake that mother-of-pearl owes its beauty to diffracted light. The error had lived long, partly, perhaps, because it came from an authority so eminent as Sir David Brewster.

A similar idea seems to be still prevalent, that butterflies and moths derive their colours from diffraction. Two of the best modern natural histories, which I have at hand, favour the supposition.

The patches on the wing are groups of uniformly coloured scales, which contain pigment. Diffraction colours are of a different character; they are many-coloured iridescent lights varying as they glance off at different angles. The distinction is familiar to a worker in optics; it is easy for anyone to appreciate it by seeing recognised forms of diffraction. I have lately examined a collection of British Lepidoptera, and found no specimens which were coloured by wave interference. The Purple Emperor has two uniform colours, grey and purple, so arranged that there is a direction of vision favourable for seeing each colour. Shot silks and Labrador spar are cases somewhat similar. I have before me a foreign Thecla which has a brilliant light-blue pigment; perhaps in this and some others a certain shimmer is added by a slight diffraction interference, but the predominant effect is the blue colouring matter.

It is, however, interesting to note that all scales have fine diffraction rulings. These lines, as in the case of diatoms, consist of rows of small spots. I have had a wing of the Small Tortoiseshell for about twenty years; the scales are complete, but the colours are faint, and the wing is partly transparent. It is possible to arrange this with care in a strong light so that brilliant rainbow lights are seen, but they are not the familiar tortoiseshell pattern. This effect does not seem to be possible with a fresh wing, so that I doubt whether butterflies are often seen to act as diffraction gratings. No doubt some insects show interference colours, but these seem usually to arise from the phenomenon caused by thin plates. Diffraction can be well studied in humming-birds; there are the brilliant, ever-varying lights, and the fine markings on the feathers may be seen with a microscope. No iridescence is more delicate than that on the side of a fresh mackerel. I am not quite sure to which class of wave interference this is due. W. B. CROFT.

Winchester College, December 30, 1901.

The Quadrantid Meteors.

NOT the least important of our annual star showers are the Quadrantids, so called from the position of their radiant in the constellation of Quadrans Muralis, which is situated between Boötes and Draco. This meteor-system