Hudd part 2 of a catalogue of the Lepidoptera of the Bristol district.

"SCIENCE Teaching in Living Nature, a Popular Introduction to the Study of Physiological Chemistry and Sanitary Science," is the title of a little volume by Mr. W. H. Watson, F.C.S., just published by Stanford.

THE additions to the Zoological Society's Gardens during the past week include two Diana Monkeys (*Cercopithecus diana*) from West Africa, presented by Mr. F. J. Crocker; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mr. C. F. S. Day; a Malbrouch Monkey (*Cercopithecus cynosurus*) from West Africa, presented by Miss Agnes Barker; a Black Stork (*Ciconia nigra*) from Jutland, presented by Prof. J. Reinhardt, F.M.Z.S.; a Rose-crested Cockatoo (*Cacatua moluccensis*) from Moluccas, presented by Miss Foster; fourteen Golden Tench (*Tinca vulgaris*, var.), presented by Lord Walsingham, F.Z.S.; a Common Buzzard (*Buteo vulgaris*), European, deposited; two Black-footed Penguins (*Sphæniscus demersus*) from South Africa, purchased; two Crested Pigeons (*Ocyphaps lophotes*), two Geoffroy's Doves (*Peristera geoffroii*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

THE ELONGATED NEBULÆ.—The amateur provided with an equatorial of fair aperture and a parallel-wire micrometer might do good service by the accurate determination of the angles of position of the elongated or greatly-extended nebulæ, of which so far the number of reliable measures is but small, though such objects are pretty commonly distributed. The necessity for further observations in this direction is well illustrated by the note to No. 2501 of Sir John Herschel's General Catalogue = H. I. 94; H. made the nebula by one observation extended n. to s., by another nf. to sp., while two observations by Sir John Herschel agree in making it extended in the parallel; "Surely," he remarks, "it does not rotate?" D'Arrest ("Siderum Nebulosorum") merely says: "Circa directionem axis nihil annotatum fuit."

In 1874 Mr. Cleveland Abbe called attention to this subject, and in the *American Journal of Science and Arts*, January, 1875, has collected the approximate places of about sixty elongated nebulæ from Herschel's catalogue, and has appended formulæ by which the right ascension and declination of the poles of a very much extended nebula may be calculated. These formulæ he has applied to such measures or estimations, often rough ones, of the angles of position as were then published.

THE NEW BINARY STAR τ CYGNI.—This star, the duplicity of which was detected by Mr. A. G. Clark in October, 1874, with the 26-inch object-glass manufactured for Mr. McCormick, of Chicago, well deserves following up; in the 3½ years to 1878·4, when measures were made by Mr. Burnham, the angle of position had retrograded 25°, with but little change of distance, though a slight decrease may be suspected. The components are about 4·5 and 8. Right ascension for 1880, 21h. 10m. 8s.; declination, 37° 32′. If the motion in angle has been equable since 1874, the position may now be about 140°.

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. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

"Report of an Unusual Phenomenon Observed at Sea"

As the unusual phenomena observed in the Persian Gulf, described in NATURE, vol. xx. p. 291, has hitherto called forth no remarks, I venture to put forward a suggestion that may be of service in elucidating the matter.

First, I would observe that the so-called parallel waves were probably arcs of large concentric circles, whose common centre lay south-south-west of H.M.S. *Vulture's* first, and east of her last, position. The distance between these positions was about a knot and a half, therefore the vessel was never nearer this centre than about half a mile, and a short arc of a circle of this radius might well be deemed straight.

The accompanying diagram, drawn from the data, shows the position of the centre of disturbance, and of the luminous waves, with relation to the course of the ship, taking the above view, which I think is borne out by the character of the second series of luminous waves through which H.M.S. *Vulture* passed.

Most living creatures possessing phosphorescence have more

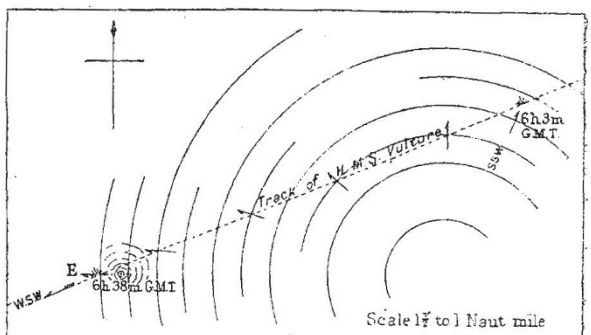

Diagram showing position of luminous wave centres

or less control over its display. In the case of the fire-fly, the light that one emits calls forth almost instantaneously answering flashes from others. No dweller in the tropics can have failed to observe the manner in which trees are lit up by the simultaneous flash of thousands of fire-flies, and the period of darkness that intervenes before the next flash. If then we consider the *Vulture* to have passed through a shoal (if I may so term it) of animalculæ, possessing the power of exhibiting phosphorescence intermittently, and exciting each other to do so, the impulse travelling from one to another at the rate of 125 feet a second, and the display of light to the dark interval bearing the ratio 1 to 3 (in time, $\frac{1}{6}$ of a second to $\frac{2}{6}$), we have accounted for the phenomena so far as the luminous waves are concerned.

What were the central disturbances that originated the action, it is impossible to say, though it is easy to imagine several causes

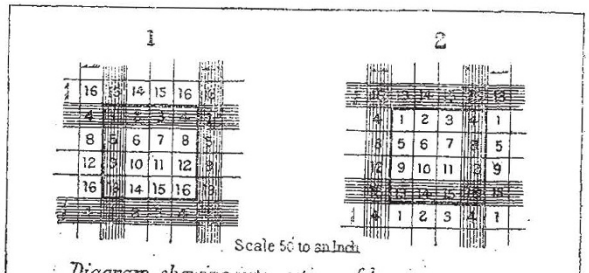

Diagram showing intersections of luminous waves.

of irritation, that would not have been detected by the simple observations taken on board the vessel.

The luminous waves of the smaller series "meeting the parallel waves from south-east did not cross, but appeared to obliterate each other at the moving point of contact." The above is difficult to explain, if the luminosity of the waves was obliterated at the actual intersections. It can however be readily shown that close to the intersections are spaces where the phosphorescence of the animalculæ would have to be displayed for twice as long a period as in other positions, and we have but to admit a want of energy to meet this call, and dark spaces will appear in each system of waves, immediately following the passage of the crossing wave.

This would certainly give the appearance of one wave obliterating the other.