fog in London, the knowledge of this rain-band would not help him much, for he knows by his chart that rain has already set in.

What he does want to know is whether the cyclone will move northwards, eastwards, or southwards. This no prognostic can tell him; the only known clue to a cyclone path is got from a knowledge of the movements of isobaric lines. In this instance the rain in London was, I think, correctly forecast, but unfortunately such a simple case rarely occurs in this country.

Thus we see that a knowledge of the amount of moisture in any current is of only secondary importance to synoptic forecasting, so that if we may welcome the rainband as an addition to our old stock of prognostics, there is little ground for hoping that it will be of further service than them.

All that Prof. Smyth claims for the spectroscope is to act as a gauge of pure vapour quantity, but it seems probable that its employment may be still further extended. There are strong grounds for believing that an air spectrum may vary not only with the amount of pure vapour, but also with the size, aggregation, and physical condition of the condensed vapour suspended in it. For instance, take the so-called rain-lines. These may appear either alone, or with a rain-band of any intensity; so that if the band is due to pure vapour only, the lines must depend on some other condition. Again in sunset tints we have a natural spectroscope whose colours certainly are the product of both the quantity and quality of the total moisture suspended in the air. I have made a large number of observations on the lurid, coppery, yellow, green, and red skies, which form such a large portion of all weather lore, but without decisive results; for sunset spectra are too complicated and too fleeting to be unravelled by a small instrument. They certainly seem to differ, but their spectra are not so marked as their appearance to the naked eye.

But even supposing that this idea is completely verified, and that the spectroscope can be used as a new weapon of research to discover the still unknown nature of clouds, and that we are ever able to say that such and such an absorption spectrum belongs to such and such a kind of sky, there are no grounds for believing that we can ever regard these spectra otherwise than as a new set of sky prognostics, or that as such they will be of more use in forecasting than those already known.

What the use of any prognostics is in forecasting, and how they are related to synoptic charts, and how isobaric lines map out the shape of rain areas, are other sides of the great problem of weather forecasting, which cannot be discussed here.

Some may differ from Prof. Smyth as to the forecasting value of the rain-band, but all will appreciate the singular skill with which he has surmounted the practical difficulties in the way of making it a quantitative measure of atmospheric vapour.

21, Chapel Street, S.W. October 2 RALPH ABERCROMBY

The Comet

WHEN observing the comet this morning, with $7\frac{1}{2}$ inch aperture and powers of 70 and 150, I at once noticed that the nucleus was far from circular, the length being carefully estimated at $45''$ and the breadth at $15''$, while the measured "Position" of the maj. axis was ($96^\circ-276^\circ$); this was also the supposed direction of the tail, which had ceased to be visible in the increasing twilight.

At 6h. om. G.M.T. the place of the comet was

$$\begin{aligned} \text{R.A.} &= 10\text{h. } 27\text{m. } 3 \pm 5 \text{ secs.} \\ \text{N.P.D.} &= 100^\circ 36' 30'' \pm 10''. \end{aligned}$$

These places, taken with the equatorial, were confirmed by measures of the not far distant star α Leonis. They differ considerably from the calculated place given in the Duncht Circular, No. 60.

WENTWORTH ERCK

Sherrington House, Bray, Co. Wicklow, October 9

"Note on the History of Optical Glass"

THE writer of the article in a recent number of your journal, entitled "Note on the History of Optical Glass," has fallen into some historical blunders and anachronisms, which are the ground of my addressing you. My grandfather was born in 1738, and would therefore have been but twenty years of age at the date when he is said to have made the acquaintance of the elder Guinand, then sixteen, in Switzerland. It is almost certain that he never was there, at any rate not as an "illustrious savant," engaged in telescopic experiments. His sister's memoirs present

a blank at this exact date, but it is evident that if he travelled at the time when he withdrew from the Hanoverian military service, it was in the character of an obscure young musician. It is just barely possible that there may be some foundation for the story now given—and if so, I should be glad to learn it—but a totally mistaken colour has been given to it by drawing on the future. What follows is still more erroneous. Dollond (the elder) was at this period at the zenith of his fame as an optician; Faraday was not born, and Herschel was an ex-bandsman; yet we are told that he "returned the following year with Dollond and Faraday." It is probably something more than a mere coincidence that about sixty years later the son of that Herschel, the son of that Dollond, and Faraday, were associated in treating with the son of that Guinand for the glasses manufactured by the latter. Apart from this, I submit that hardly anything new is contributed in the "Note." All, and more than all, which it contains will be found in the *Biographie Universelle*, under the name GUINAND, where also is mentioned the Swiss rencontre, but with the name DROS in lieu of "Herschel and Utzschneider." According to the *Biographie*, Guinand was born "about 1745," and died in 1825. It was in 1821 that the Astronomical Society was instigated to make inquiries (conducted by my father) regarding Guinand's optical glasses.

J. HERSCHEL

A "Natural" Experiment in Complementary Colours

ABOUT two miles above Ormeim, in the Romsdal (Norway) is the well-known Slettafos, an imposing cascade formed by the impetuous Rauma, which here plunges through a deep rocky ravine. Fascinated by the scene, I stood watching the foaming water for some time, and all at once noticed a most beautiful and delicate rosy pink tint colouring the foam and spray in the ravine. The water, where not broken up, was of a green colour, and the pink tint was at once explained as its complementary. But the point of special interest to me was that this pink colour was not visible except on those parts of the spray and foam which were in the shade of the gorge. In the full light these appeared, as usual, white. The result above described is an excellent illustration, afforded by nature herself, of the advantage of toning down the brightness of the white surface, upon which we wish to evoke a complementary tint, until it no longer exceeds that of the exciting colour—the green in this case.

CHAS. T. WHITMELL

H.M. Inspector of Schools

9, Beech Grove, Harrogate, September 11

Animal Intelligence

IN the article on animal intelligence (NATURE, vol. xxvi, p. 523), Mr. Morgan seems to me to have inverted the real process in the case of what he calls "isolation," for he says: "I believe such abstract ideas to be impossible for the brute. I believe them to be the outcome of the use of language." The process of abstraction here alluded to is the conception of a quality apart from the things that possess that quality, as whiteness or edibility.

I watched a little child just able to walk alone, on a railway platform. It went up to a square box, and after staring at it for a few seconds, slowly passed its hand over the top, front and sides, and then along the edge, clearly testing the sense of sight by that of touch. It then did the same with the small wheel of a luggage barrow. It was obviously too young to be able to speak, but I think we may safely assume that it got a notion of what we call "square" and "round." Now a dog can readily acquire a somewhat similar experience, by finding a barrel to be less easy to stand upon than a square box. So far they are much alike; the child, however, certainly exhibited a greater inquisitiveness than a dog is likely to do.

It is obvious that a dog can receive just the same impressions as a child through the senses, so that automatic appreciation of the difference between roundness and squareness is common to both; but, whereas, the dog, as I believe with Mr. Morgan can never get beyond that stage, a child, if not an infant, can make the difference an *object of thought* or a mental abstraction, even without having a word to express it; just as an adult experiencing a new but uncomfortable sensation, can think of it, and coin a term to express it, say, "all-overish-ness;" or again, as one can *feel* indignant or benevolent, and at the same time think about such states without necessarily giving expression to them. If words were necessary, as Mr. Morgan seems to think, then a deaf-

mute, who had never been taught to speak, could never rise higher than a brute, because he cannot picture "justice" or "edibility." But if we recognise the power to abstract the conception of roundness, justice, edibility, &c., then can be felt the want of symbols to represent them; just as a concrete thing, say, a tree, needs the word "tree" to stand for it. Instead, therefore, of considering abstract ideas as an "attempt to conceive a reality-in-thought answering to certain of our symbols," I would completely reverse the process, and make speech itself as the outcome of our power of making abstractions objects of thought, i.e. not only can we be conscious of what is white, as a dog also can, but we, and we alone, can be conscious of whiteness; and just as the symbol "white" is invented to stand for the concrete, so "whiteness" is the symbol invented to stand for the abstract.

GEORGE HENSLOW

Drayton House, Ealing

An Insect Attacking a Worm

MR. E. LAWRENCE'S letter in this week's NATURE reminds me that, walking, now many years ago, on a very hot and bright summer's day, I saw a huge earthworm crawling across the hard-beaten and sun-baked highway. What has brought you forth at such a time? I asked, and speedily got my answer. For, coming nearer, I found the larva of some beetle holding on obstinately by the poor worm's tail. I had not leisure to wait the result; and indeed, although here memory does not help me, I may have interfered on behalf of the worm, and so failed to witness anything corresponding to Mr. Lawrence's interesting experiences.

Even although such encounters as that witnessed by him may be but rarely visible, I venture to believe that earthworms very often fall victims to predaceous larvæ. Those of the Caribidæ and other predaceous beetles are common enough, that of the well-known ferocious being, the "rove-beetle" (*Staphylinus olens*), for example. The singular pointed tail-appendage of its larva, supposed to assist locomotion, may have a more important use. Turned to an acute angle with the body, it may effectually help the larva to hold its place in a worm-hole against the efforts of its prey to escape from its jaws. And only when the captured worm is very powerful may it be able to come to the surface of the ground, dragging its relentless foe along with it. Such, indeed, was the worm I saw, which had thriven well in the rich meadow-land bordering the Portobello Road, near Edinburgh, copiously irrigated with town sewage, and famous for its fertility. It was the largest I remember ever to have seen, to the best of my belief at the time not less than a foot long, while its assailant might be about an inch only, more or less.

WILLIAM SWAN

Ardochapel, Dumbartonshire, October 6

YOUR correspondent, Mr. Edwin Lawrence, is mistaken in supposing that the worms of England enjoy immunity from attacks such as he witnessed at Laqueville. I saw, in North Devonshire, in the last week of July, 1882, an incident precisely like that which he narrates. The insect I should judge from his description was identical. What particularly impressed me was its enormous strength, for the earth-worm, which was a large specimen of its kind, must have had at least twenty times the bulk of its adversary, and yet the insect, seizing upon the middle of the body, dragged it by main force a distance of three or four inches. It was cunning as well as strong; for when it found that the corpse, dragged loopwise from the middle, met with considerable resistance from the stiff wiry grass, it seized hold of the head, brought it round over the middle, and endeavoured to drag the worm lengthwise between the opposing stalks. I watched the attack for some time, and then removed the insect with my stick to a distance to see if it would find out the worm again, but in doing so I unfortunately injured it. When I first saw it the worm could still crawl, though feebly, but at the end of the attack it was quite motionless.

HERBERT RIX

Science Club, Savile Row, W.

MR. WALLACE, of Tynron, Dumfriesshire, related to me an incident which he was witness to, a few months ago, so similar to that related by your correspondent, Mr. Lawrence, that I called his attention to the communication of the latter. The worm Mr. Wallace observed, was attacked by the same kind of caterpillar-like animal, the difference being that after much

twisting and wriggling, about two-thirds of the worm broke away and escaped, leaving one-third in the enemy's possession, upon which it seemed to settle down for the purpose of a meal.

J. SHAW

Chiasmodon Niger and Notacanthus Rissoanus

IF the "singular fish of a deep black colour, with small eyes, and a most abyssal physiognomy," noticed by Prof. Giglioli (NATURE, vol. xxv. p. 535) had been a *Chiasmodon*, that learned ichthyologist would doubtless have recognised it, and not suggested that "it may be allied to *Malacosteus*." But in addition to the two specimens of *Chiasmodon niger* referred to by Mr. Johnson (NATURE, vol. xxvi. p. 453), it may interest ichthyologists to learn that a third specimen has been found off the New England coast (on the Le Have Bank). Like the others previously known it had engorged a fish several times larger than itself. The specimen is now in the U.S. National Museum. *Chiasmodon*, it may be added, is not at all related to the Gadidæ, as has been supposed by Messrs. Günther and Johnson, but is a true Acanthopterygian fish and the type of a peculiar family—the *Chiasmodontidæ*. [In Dr. Günther's "system" it belongs to the heterogeneous family *Trachinidæ*.]

With respect to the *Notacanthus rissoanus*, for which a new generic name has been proposed by Prof. Giglioli, permit me to state that prior designations have been suggested. In fact the genus has now received five names, viz.: (1) *Campylodon*, Günther, prov. name, 1861 (not of Fabricius, 1878, and not defined); (2) *Polyacanthonotus*, Bleeker, 1875; (3) *Zanotacanthus*, Gill, 1876; (4) *Paradoxichthys*, Giglioli, 1882; and (5) *Teratichthys*, prov. name Giglioli, 1882.

THEO. GILL

Smithsonian Institution, Washington, September 18

PROFESSOR HAECKEL IN CEYLON¹

VI.

IN his walks through the Singhalese village, of which he preserves so many pleasant memories, Prof. Haeckel was particularly struck with the comparative rarity of the weaker sex, especially of girls between 12 and 20 years of age.

"The greater number of children playing in the streets were boys. Girls are early accustomed to remain inside the huts and employ themselves in household work. Besides this, they develop very young, being often married at 10 or 12 years old, and old women at 20 or 30. Grandmothers of 25 to 30 are very frequent. A further significant fact is the permanent disproportion of male and female births among the Singhalese. The average is 10 boys to 8-9 girls. This fact is connected, to some extent at least, with the curious institution of polyandry. In spite of the efforts made by the English Government to suppress this custom, it maintains its ground, especially in the more remote districts of the Island. It is not unusual to find two or three brothers with one wife in common, and ladies may be found the happy possessors of 10 or 12 husbands. These complicated family arrangements form the theme of many extraordinary stories; but it is very difficult to distinguish fact from fable on the subject. . . .

"The Singhalese have a passion for music and dancing, and practise both arts according to a standard of taste very different from our own. Their principal instruments are the drum and the tom-tom, vigorously belaboured with wooden drum-sticks; besides these, they have reed-pipes, and a very primitive stringed instrument of one string. My evening calm was often broken in upon by the din of these ear-splitting instruments, and if I followed the sound to its source I was sure to find, in front of a fire under a palm tree, a group of ten or a dozen naked brown fellows, gaily painted with white, yellow, or red stripes, and indulging in the most extraordinary antics. A circle of spectators stood round, and followed the grotesque performance with devout attention.

"At Christmas time (the Buddhist New Year) these evening 'devil-dances' are more frequent, and partake

¹ Continued from p. 503.