

reasons can be: I only know that they must be of a totally different order from those which constituted the substance of his published criticism.

Of course the question whether or not these physiological varieties *do* occur is quite distinct; and I most heartily agree with Mr. Wallace that this is a question of fact which ought to be decided, before it can be worth anybody's while to attack my suggestion upon any other grounds. If Mr. Wallace had seen this in the first instance, he might have saved both himself and me a good deal of trouble; but at the same time he would have deprived me of no small amount of encouragement. For I am now more than ever satisfied that the suggestion does not admit of being assailed on any grounds of general reasoning; but, on the contrary, that as a theory it is antecedently probable, and can only be refuted—if it is to be refuted—by an appeal to fact in the form of experiment. And as I cordially hope that this may be the last time that I shall have to address you upon this subject, I should like to neutralise the discouraging influence on experimental verification which may have been exercised by premature criticism in your pages. This I hope in some measure to effect by making two remarks. The first is that my own estimate of the antecedent probability of the theory is shared by some of the highest "authorities" on the Continent. The second is that, in all the lines of inquiry hitherto pursued, I find striking evidence of the actual occurrence of the physiological varieties in question. But as this evidence requires to be largely supplemented by experiment, and as every experiment requires at least three years to perform, those biologists who think with Mr. Wallace may be glad to hear that it will be a very long time before I shall have occasion again to trouble them with the theory of physiological selection.

GEORGE J. ROMANES

#### The Alleged Ancient Red Colour of Sirius

WITH reference to your paragraph last week (p. 378), in the "Astronomical Column," on "The Alleged Ancient Red Colour of Sirius," it does not seem to have been noticed that the early observations of Sirius were made at its heliacal rising. Under these circumstances the sun is a red star.

F.R.S.

#### A Green Light at Sunset

AT sunset to-night I observed a phenomenon which has, I believe, been seen from on board ship, but never probably from a place with such a distant sea-horizon as we have here—some seventy miles. The sky for a short distance above the point where the sun set was perfectly clear of cloud or haze, and I watched carefully the last portion of its disk disappear into the sea. As soon as the last speck of the yellow vanished, a momentary bright green flash shone out. This was quite different from the complementary green seen after looking at the setting sun; brighter and bluer in tint. I have seen it stated that the cause of this green light is the sun shining *through* the water that hides it, and would be glad to know if such is the true explanation.

R. T. OMOND

Ben Nevis Observatory, February 12

#### Sunset Phenomenon

ON February 21, at 5.25 local time, my attention was attracted by a bright red glow reflected from the earth outside a window having an eastern aspect.

On going out of doors to the Observatory, it was evident that this crimson light proceeded from a band of cloud about  $10^\circ$  in width forming a great circle in the heavens, and intersecting the horizon at points, as well as I could estimate,  $145^\circ$  W. and  $35^\circ$  E. of true north, the inclination of this great circle to the horizon being about  $15^\circ$  or  $20^\circ$ .

In less than three minutes, before I could reach the Observatory, the magnificent spectacle had completely vanished, and in the place that it had occupied were merely some streaks of cirrus and cirro-stratus, the latter being nearest to the place where the sun had set, and in half an hour the entire heavens were cloudless.

Will reflection, or refraction, or both, suffice to explain the above?

Shankhill, Co. Dublin

WENTWORTH ERCK

#### Aspects of Clouds

IN Mr. Ruskin's "Modern Painters" (i. Part 2) I have noticed the following passage amongst the author's remarks on the aspects of clouds:—

"I have often seen the white, thin, morning cloud edged with the seven colours of the prism. I am not aware of the cause of this phenomenon; for it takes place not when we stand with our backs to the sun, but in clouds near the sun itself; irregularly and over indefinite spaces, sometimes taking place in the body of the cloud. The colours are distinct and vivid, but have a kind of metallic lustre upon them."

And again, the author describes the "scattered mists rallying in the ravines and floating up towards you along the winding valleys till they couch in quiet masses, *iridescent* with the morning light, upon the broad breasts of the higher hills."

Dr. Johnstone Stoney recently read a paper to the Royal Dublin Society entitled "The Iridescent Phenomena in Clouds," wherein he explains the cause of a somewhat similar appearance which clouds at times present. Their outer portions are suffused with soft shades of colour like those of mother-of-pearl, a lovely green being generally conspicuous. The tints are usually distributed in irregular patches as in mother-of-pearl, but in some cases they form a regular fringe. Dr. Stoney explained that these phenomena are due to particles of ice, in the form of crystals of various sizes and shapes, and according to their position and character the sun's rays are reflected through them in various colours, thus producing the beautiful effect.

Would this be an explanation of the appearances to which Mr. Ruskin refers?

ROBERT JAMES REILLY

Boyle, Ireland, February 17

#### A Recently-Discovered Deposit of Celestine

IT may, perhaps, be worth mentioning that a large and valuable layer of celestine has been lately found at Yate, in Gloucestershire. It lies just below the sub-soil upon a bed of red Triassic marl, which rests unconformably upon the coal-measures, just at the eastern edge of the Bristol coal-field in that district.

The deposit is, for the most part, about half a metre or more in thickness, and consists chiefly of loose nodules which, when broken, are seen to be masses of white, crystalline, nearly pure celestine. Geodes are occasionally found, one of which, about 15 cm. in diameter, lined with fine clear crystals, is now in our school museum. Beautifully transparent, though not well crystallised masses of selenite also occur in the deposit, and in these are sometimes inclosed single detached crystals of celestine. I picked out one crystal (though it seemed almost sacrilege to break up the fine specimen of selenite), which is about  $7 \times 4.5 \times 1.5$  cm., doubly terminated, fairly clear, and showing very perfect, well-developed faces. Its density is 3.95, and it shows very perfectly the characteristic light-bluish tinge of celestine.

It would, I think, be quite worth while for any mineralogist who happens to pass near Bristol to pay a visit to the place, which is only about twelve miles distant on the Midland Railway to Gloucester. The extent of the deposit is not known, but when I was there in October last, and again at Christmas, it was being worked in several fields north-east of the church, about a mile and a half from the station. Large quantities are being sent away, of course for the purposes of sugar-refining and adulterating white-lead paint.

H. G. MADAN

Eton College, February 21

#### "Culminating Sauropsida"

IT is with satisfaction that I note in NATURE of February 3 (p. 331), that Prof. W. K. Parker finds it more and more impossible "to conceive of birds as arising *direct* from the Dinosaurs, or indeed from any other order or group of reptiles." The sentence, no doubt, suggests an indirect origin of birds from reptiles; but, further on, Prof. Parker explains that if protovertebrate forms existed it is quite supposable that a metamorphosis may "have taken place of this and that *quasi*-larval form into archaic reptile, ancestral bird, or primitive mammal." We must therefore conclude, either that there were two kinds of protovertebrates, namely, piscine and reptilian—or ichtyopsidan and sauropsidan, as Prof. Parker would probably prefer to call them—fundamentally distinct or preceded by common ancestors,