

was, certainly, designed as a scientific one, and indeed as a substitute for the course on mathematics suspended temporarily by force of circumstances. My own motive for drawing attention to the point will not, I think, be misunderstood, when so lately I had occasion in your columns to say a word for psychology as a natural science.

University College, Sept. 23

G. CROM CROFTON ROBERTSON

Mirage

In connection with Mr. Kingsley's letter in your number of today on Mirage, I may mention that when in a steamer going up the Thondjem Fiord, in Norway, last July, I saw some remarkable Mirage effects. In one case there appeared to be a large city, which altered as the ship advanced into a long line of very white cliffs of basaltic formation and then disappeared, and nothing was seen but very some low rocks; in other cases there appeared to be rocks suspended in the air at some distance from the surface of the water. It was a fine afternoon, and the sea very calm.

W. P. M.

Liverpool, Sept. 22

Meteor

At 8.30 p.m. on Sunday the 11th, a fine meteor was seen in the zenith traversing from East to West. It had a comet-like tail, and a star-like head; visible altogether for about ten seconds. In passing there was a "hiss" sound, as of a rocket. At 8 p.m. on Thursday the 15th, the Aurora or Northern Lights were very bright—mostly red, divided by rays of whiter light. Many persons, who were upon the pier, thought there was "a fire somewhere!"

Lowestoft, Sept. 16

SEPTIMUS PISSIEZ

Origin of Species and of Languages

THE extreme brevity of my former letter on this subject seems to have hindered Mr. Ransom, and perhaps other readers, from appreciating the analogical argument I used. Will you, in consideration of the importance of the inquiry, allow me now to illustrate that argument at greater length?

There are two sets of facts that stand out in marked contrast. No irrational animal has ever formed a language. Man alone, in all his varieties, has.

I agree with Mr. Ransom that no language has originated from an intention to form a new language; I see no reason to doubt that languages have arisen from the gradual variation, selection, and combination of a few primary sounds; and I think that existing languages are constantly undergoing change through the operation of physical, physiological, and other natural causes, irrespectively of reason. But the fact remains to be accounted for, that no animal unendowed with reason has ever selected and combined sounds into a language.

The cause does not lie in a want of significant sounds to begin with. No one who has ever owned a dog is ignorant how many emotional sounds—sounds, too, that vary greatly in individuals and varieties—he makes use of; but he has never even begun to make a language of them. Neither does the cause lie in a want of power to distinguish, and in the case of some animals, to imitate very accurately the natural sounds they hear, so as to have a supply of vocal symbols for things and occurrences ready for adoption if they will. But can any irrational animal be named that has ever begun to use such sounds as symbols denoting things or events, still less to modify them in order to express modified meanings, and far less to combine them into symbols of complex things, or into phrases, propositions, and sentences? The mocking-bird mimics the song of the whip-poor-will, the creaking of the wheelbarrow, the lowing of the ox, and the patterning of the rain; but does it ever, like the Greeks, Romans, and Gaels, speak of the ox by the name of *bo*; or, like us, speak of the rain as *pattering*: or modify that sound, like the Hebrew and the Teutonic races, into a name for the substance that patters (*matar*, *water*, *Wasser*), and use it to tell that it wants a drink? Least of all, has any irrational animal ever juxta-placed sounds, as the Chinese do, in different orders to express different relations between the things they denote; or with Aryans, modified sounds into prefixes and terminations to express metaphorically such abstract relations?

Every step in these processes involves an exercise of reason. True, there is no grand intention on the part of one man or

nation to form a language, but there are countless intentions of individual men to express individual ideas and thoughts as they emerge, or to express them more accurately than before; and then, when one man by an exercise of reason devises and uses a new symbol or phrase, others imitate and adopt it. And so, while I admit that there are unintentional variations of words, and consequently (by degrees) of languages; and while I admit that there has been no intention to form a language as a whole, I think we must say that it is by countless intentions of rational beings that languages have been gradually formed.

It may be objected that savages possess languages, and that they are not rational. "My monkey *Wallady*," writes Sir Samuel Baker, "looks like a civilised being in comparison with the Nuehr savages." And yet, while the Neuhr savages have a language, Wallady has none, any more than my terrier Shag, knowing fellow though he be. Why this contrast, but because the most savage man is differenced from all other animals by the possession of reason?

Now, then, the argument against the theory of the formation of the species, or of their endowment with new organs, by a reasonless process, is this:—The experiment of the possibility of such a thing has been actually tried on the most extensive scale in the analogous matter of language, and has failed—failed in every instance except where reason has been at work to prompt and direct. Ought we not then to pause, while our data are so imperfect, and while science is making strides that may soon bring her to a point of view that will show her present logic to have been utterly at fault—to pause before entertaining a thought so revolutionary and perilous as that an eye, a beast, a man has been formed without presiding intelligence or design at all.

The subject is seductive; but I fear I have already encroached too much on your space.

WILLIAM TAYLOR

The Cockroach

THE cockroach (*Blatta orientalis*, Linn.) has found an apologist in Dr. Norman Macleod, who asserts his incredulity in the current stories of this insect's bad habits. Cockroaches look, he says, like black priests among the beetles, and, like the priesthood generally, have been made the objects of misrepresentation and slander. Anyhow, the doctor treats as mythical the tradition, constant on ship-board, that cockroaches are in the habit of nibbling the nails of those who sleep with their feet uncovered. Not only are they harmless, but they are absolutely useful, inasmuch as they may be readily trod upon and killed by all who are willing to gratify their feelings of disgust and benefit society. In the history of the cockroach we can trace the origin of the nail-nibbling myth, if myth it be. The insect is indigenous in the warmer parts of America, and, in spite of its Linnean name, is only oriental through having been carried to the East by shipping. It has a natural love for warmth and for sweet things, and can indulge the latter taste by feasting on the feet of natives engaged in sugar manufacture. If Gilbert White is correct in his surmise that the insect was not introduced into England until late in the last century, its powers of reproduction and adaptation must be very large. It is, of course, very difficult to identify with absolute certainty the insects mentioned in classical authors, but there is a good deal to lead one to suppose that the *μυλακης* mentioned by Aristotle and the *Blatta histrionum* of Latin writers was the same as our loathsome pest. The English name is curious and worth investigation, but unhappily there is so much guess-work employed in derivations that this branch of philology cannot claim to be recognised as one of the "exact sciences."

Norton Court, Weobley

C. J. ROBINSON

On the Dissipation of Energy

THE value of the successive numbers of NATURE is not a little enhanced by the papers of Professor Balfour Stewart on "Energy," which also lead us to long for his forthcoming volume on "Physics." If that work prove equal to that which he has already published on "Heat," it will give us a manual which may well compare with the best of those which have been published abroad, and it will besides possess a freshness of its own.

But is it desirable that the doctrine of the conservation of energy should be represented everywhere as a modern discovery? No doubt the experimental verification of the transformability of equivalent quantities of mechanical power of various kinds into equivalent temperatures is a modern discovery. But the doctrine itself