

single bright colour, scarlet for instance, a kind of shadow appears to come over any part of the surface to which I direct the eye.

With respect to my absolute power of perception of colour, I believe that though I cannot be said to be colour-blind, my eyes are less sensitive to colour than the average of those who have equally good general sight. For instance, scarlet and green do not appear to present to me the same degree of contrast that they do to most persons with whom I have made the comparison. Close at hand the contrast is sufficiently vivid, but a scarlet uniform seen at some distance in a green field would not attract my attention by contrast of colour, though I could make out the difference under a favourable light when my attention had been called to it; so also the scarlet berries of the mountain ash would at a little distance attract my notice rather by their form than by their colour, especially if seen against the sky or a bright object. Again, I can never pronounce with certainty as to the colour of distant bright lights; the colours of the lights, for instance, used for railway signals, though distinctly enough perceived by me when close at hand, puzzle me much when seen at a distance, while I am quite incapable of assigning with certainty a colour to a star or a meteor.

I should add that my ordinary power of vision is good; though here my right eye has a slight, but unmistakable, advantage as to distinctness over my left. Hence, in looking at a brilliantly-coloured picture I have found that I could appreciate the drawing best with my right eye, the colour with my left, while in using both eyes each appears to remedy the defect of the other.

I think that the facts which I have here stated cannot fail to be of interest to those who are inclined to theorise on the nature of colour-blindness; but apart from all theory it would be satisfactory if the statement of my case should induce others to examine their own perceptions of colour with each eye separately, and in the event of their observing anything confirmatory of, or contrasting with, my observations, to send an account of them to NATURE. I think it quite possible that such cases may not be very uncommon, since the defect is one which may easily escape the notice of the subject of it.

Harrow, August 1

ROBERT B. HAYWARD

The Source of Solar Energy

MR. GREG still misses my meaning. I do believe that meteors supply a portion of the solar energy, and I also believe that they fall in enormous quantities into the sun; what I do not believe is that the whole solar energy is derived from meteors, or that any meteors fall in a solid state upon the sun (whose surface is also certainly not solid, even if any part of his mass be).

Mr. Greg's reasoning only proves what I have already pointed out, that none of the meteor systems our earth encounters can supply a meteoric downfall on the sun. This is, however, so obvious as to need no enforcing.

The reasoning by which I show that enormous quantities of meteors must fall upon the sun is wholly untouched by Mr. Greg's arguments, and is, so far as I can see, simply incontrovertible.

Surely Mr. Greg is not in earnest in saying that there would be a loss of solar energy if a large mass of iron fell on the sun before it was quite melted (any conceivable mass would, by the way, be vaporised), *because the sun would have to melt the portion which remained solid*. That solar energy would be consumed in the process is true enough; but if Mr. Greg supposes that the total solar energy would be diminished, he altogether misapprehends the whole subject he is dealing with. If the action of the solar energy in changing the condition of matter forming (as the imagined meteorite would) part of the sun's substance had to be counted as loss of energy, the sun would be extinguished in a very short time indeed. Such processes involve exchange, not loss.

If the earth could be placed on the sun's surface, the action of the sun in melting and vaporising the earth, and producing the dissociation of all compound bodies in the earth's substance, would involve an enormous expenditure of energy, yet the solar energy, considered as a whole, would be recruited, even apart from the fact that the earth would serve as fuel. The absolute temperature of the sun would, I grant, be diminished in this imaginary case, though quite inappreciably, but his total heat would be increased by whatever heat exists in the earth's substance.

Apart from this, however, if the minimum velocity with which a meteor or other body can reach the sun, is such as would—if wholly applied to heating the body—completely melt it, then the size of the body makes no difference whatever in the result. The meteor might not be melted if enormously large, but in that case the balance of heat would be communicated to the sun. In reality, of course, the heat corresponding to meteoric motion near the sun is very far greater than is here implied.

But I really must apologise for bringing before your readers considerations depending on the most elementary laws of the conservation of energy.

RICHARD A. PROCTOR

Muller's Physics and Meteorology

FROM Prof. Jack's Review of Müller's "Physics and Meteorology," in your issue of August 4, I infer that he is not aware that an earlier edition of that valuable book was translated into English more than than twenty years ago, and formed one of the volumes of Baillière's *Scientific Library*.

M.A. Cant.

Aug. 7

Colour of Water

MR. E. R. LANKESTER, in his letter in NATURE on 21st July, does not mention what is certainly one of the most remarkable known instances of a decided colour in water, I mean the Blue Lake near the road from Frutigen to Kandersteg in Switzerland. It is very small, not a stone's throw across. I think it is fed by springs. Its blue tint is so decided as to give the idea of some colouring stuff mixed with the water—not that it can be really so.

The Lakes of Neufchâtel and Bienne are of the same light-green tint as those of Lucerne, Brienz, and Thun, although the latter are fed by glacier streams and the former are fed by the streams of the Jura, where there are no glaciers. This appears to prove that the solid matter which glacier streams contain in suspension can have nothing to do with causing the green tint of most of the Swiss lakes.

JOSEPH JOHN MURPHY

Old Forge, Dunmurry, Co. Antrim, Aug. 5

Water Analysis

YOUR article entitled "Water Analysis" consists of a review of a book, a commentary on a paper, and the reviewer's opinions of the character of Mr. Chapman and myself.

I shall not trouble you with any rectification of the statements contained either in the review or in the commentary on the paper; inasmuch as both the book and the original memoirs are accessible to the readers of NATURE, and the entire subject has already been very fully discussed.

In giving his opinion on the character of the authors of the book, the reviewer "deplored that two young chemists, with such undoubted abilities as Messrs Wanklyn and Chapman possess, should have rendered themselves notorious by attacking older workers in scientific investigation."

Perhaps you will allow me to say, that in rendering ourselves notorious in this manner, we have committed no crime, and that I cannot see why it should be deplored.

I believe that a great deal of the work which these older workers have done is unsound, and have endeavoured to sweep away some of that which I believe to be unsound. In this sweeping I have been to some extent successful, successful to an uncomfortable and alarming extent, I suppose your reviewer would say. But, if the rottenness of much that passes current in science is appalling, it is surely matter for congratulation that there are young men who will undertake a crusade against it, even at the risk of incurring the disapprobation of the older men, and of suffering every wrong that the possession of place and power enables these older men to inflict.

London, Aug. 14

J. ALFRED WANKLYN

[Mr. Wanklyn omits the sentence following his quotation:—"It is, no doubt, very laudable in a young and ardent investigator, when he points out that high authorities may err, and frequently have erred, but the manner in which these gentlemen have carried out their corrections has made their matter more distasteful."—ED.]

Suckers from the Apple Tree

MOST of the orchards in the west of Herefordshire have had their herbage injured during the present season by the extraordinary profusion of suckers thrown up by the apple-trees. In