

a practised mesmeriser, and was able to produce on my own patients almost the whole range of phenomena which are exhibited in public as illustrative of "mesmerism" or "electrobiology." I carried on numerous experiments in private, and paid especial attention to the conditions under which the phenomena occur. During the last seven years I have had repeated opportunities of examining the phenomena that occur in the presence of so-called "mediums," often under such favourable conditions as to render trick or imposture simply impossible. I believe, therefore, I may lay claim to some qualifications for comparing the mesmeric with the mediumistic phenomena with especial reference to Mr. Tylor's suggestion, and I find that there are two great characteristics that broadly distinguish the one from the other.

1. The mesmerised patient never has doubts of the reality of what he sees or hears. He is like a dreamer to whom the most incongruous circumstances suggest no idea of incongruity, and he never inquires if what he thinks he perceives harmonises with his actual surroundings. He has, moreover, lost his memory of what and where he was a few moments before, and can give no account, for instance, of how he has managed to get out of a lecture-room in London to which he came as a spectator half an hour before, on to an Atlantic steamer in a hurricane, or into the recesses of a tropical forest.

The assistants at the *séances* of Mr. Home or Mrs. Guppy are not in this state, as I can personally testify, and as the almost invariable *suspicion* with which the phenomena are at first regarded clearly demonstrates. They do not lose memory of the immediately preceding events; they criticise, they examine, they take notes, they suggest tests—none of which the mesmerised patient ever does.

2. The mesmeriser has the power of acting on "certain sensitive individuals" (not on "assemblies" of people, as Mr. Tylor suggests), and all experience shows that those who are thus sensitive to any one operator are but a small proportion of the population, and these almost always require previous manipulation with passive submission to the operator. The number who can be acted upon without such previous manipulation is very small, probably much less than one per cent. But there is no such limitation to the number of persons who simultaneously see the mediumistic phenomena. The visitors to Mr. Home or Mrs. Guppy all see whatever occurs of a physical nature, as the records of hundreds of sittings demonstrate.

The two classes of phenomena, therefore, differ fundamentally; and it is a most convincing proof of Mr. Tylor's very slender acquaintance with either of them, that he should even suggest their identity. The real connection between them is quite in an opposite direction. It is the mediums, not the assistants, who are "sensitives." They are almost always subject to the mesmeric influence, and they often exhibit all the characteristic phenomena of coma, trance, rigidity, and abnormal sense-power. Conversely, the most sensitive mesmeric patients are almost invariably mediums. The idea that it is necessary for me to inform "spiritualists" that I believe in the power of mesmerisers to make their patient believe what they please, and that this "information" might "bring about investigations leading to valuable results," is really amusing, considering that such investigations took place twenty years ago, and led to this important result—that almost all the most experienced mesmerisers (Prof. Gregory, Dr. Elliotson, Dr. Reichenbach, and many others) became spiritualists! If Mr. Tylor's suggestion had any value, these are the very men who ought to have demonstrated the subjective nature of mediumistic phenomena; but, on the contrary, as soon as they had the opportunity of personally investigating them, they all of them saw and admitted their objective reality.

ALFRED R. WALLACE

Development of Barometric Depressions

IF I have misrepresented Mr. Ley's views, the misrepresentation was certainly unintentional; but after fairly considering his letter in NATURE of February 29, I am unable to see that I have misrepresented his views, so far as they are exposed in his "Laws of the Winds prevailing in Western Europe." Part II., of course, I ignored. It is not yet published; for aught I know, is not yet written; and as I have not the pleasure of a personal acquaintance with Mr. Ley, it is difficult to understand how I could be expected to express any opinion on a book which is still in the womb of the future. But as to the present work,

Part I., which I read and reviewed, it is mainly occupied with instances, ingeniously worked out, in illustration of the rule which he distinctly enunciates, that revolving storms are due to the depression of the barometer caused by a heavy rain over a large area. Perhaps, in the same way, Part II. is to be mainly occupied by an examination and discussion of the still more numerous instances in which revolving storms have not followed heavy rain over a large area; and if so, I shall be glad in due time to give it my best attention. But for the present, having before me merely the author's existing work, I repeat what I have, in effect, already said, that the occasional or even frequent sequence of rain and storm does not establish between the two a relationship of cause and effect.

A very casual examination of our own registers, and those of Western Europe generally, would show that instances of rainfall quite as great as any that Mr. Ley adduces, happen very frequently without any storm following; and clearly if Mr. Ley's rule is sound, it must apply to all instances which cannot be claimed as exceptions, and that not only in our own latitudes, but in other parts of the world, and especially in those parts where the rainfall is excessive. It was certainly not "necessary" to travel to Khasia for instances of the failure of this rule; but its failure was exhibited in the most full and clear manner by a reference to that extraordinary rainfall.

Mr. Ley speaks of some "fact" relative to the Himalayas which "may be denied." I do not quite understand what fact he means. The facts I have spoken of are the "heavy and long-continued precipitation," and a very great depression of the barometer." If it is either of these that he wishes to deny, I can only say that his doing so confirms my former statement that he has confined his investigations too exclusively to Western Europe. But when I spoke of the one as causing the other, it was not as stating a fact, but as suggesting a probability; whilst whether there is or is not "a region in which Ballot's rules are contravened" I am unable to say; if there is I have not discovered it, and I don't know where it is, but it is not near the Himalayas, where, so far as we know, the circuit of the wind is quite in accordance with Buys Ballot's Law, though on a scale of extreme magnitude—of such magnitude indeed that our observations do not extend to the end of it. It is curious that an author who, like Mr. Ley, writes sensibly within his professed boundaries, should have limited his studies so closely as he appears to have done; but as the remark to which I have just referred shows pretty conclusively that he has not examined into the range of the barometer in India, so the remark which he makes about the advance of cyclones "in the West Indies, *e.g.*," shows that he is strangely in the dark as to the variations of temperature in the tropical Atlantic.

The columns of NATURE are not the place to discuss at length such well-worn subjects as either Buys Ballot's law or the influence of the earth's rotation, and certainly whether the earth's rotation does or does not produce the effect attributed to it, was quite beyond the scope of my former allusion to it; but I said and repeat that its influence is not "obvious," that an argument based on it is not a "truism," and that to apply these words to a point that is at any rate doubtful is both objectionable and improper.

J. K. L.

Solar Intensity

I HAVE read with interest the criticism in your last number of Padre Secchi's Solar Intensity Apparatus. With reference to the single point of the discordant results obtained by thermometers with bulbs of different size, I would observe that I encountered a similar difficulty some years ago in investigating the adaptability of the instrument invented by Herschel, commonly called the "black bulb *in vacuo*," to regular comparable meteorological observations. I found that the large bulbs always gave a higher reading than the small bulbs. I supposed this to proceed from the colder stem depriving the blackened bulb of its heat, the larger bulb, of course, losing less than the smaller, and I overcame the difficulty entirely by having about an inch of the stem as well as the bulb coated with lamp-black. I am not sure, however, that this would answer so well in a non-exhausted chamber. Probably a small bulb will always be cooled by convection more rapidly than a large one.

In the excess of the temperature indicated by the improved instruments I have referred to over the temperature of the air, at the same height—usually 4 ft.—above the soil (which is also very