

## ETHNOLOGY AND SPIRITUALISM

THE *Academy* of February 15 contains a review by Mr. A. R. Wallace, of my "Primitive Culture," where he raises a point on which I wish to make some further observations; but inasmuch as the form of publication of that journal adapts it rather to criticism than to correspondence, I ask leave to change the *venue*, and make my remarks in the columns of NATURE.

In "Primitive Culture" (Vol. i., pp. 279-84), I have given an account of the widespread popular belief in "were-wolves," including under this heading the analogous belief in man-hyænas, man-tigers, &c. According to this superstition, certain human beings are considered to be temporarily transformed into wolves, hyænas, or tigers, and in these shapes to go about preying on mankind. While expressing an opinion that "the origin of this idea is by no means sufficiently explained," I have offered two suggestions as bearing on its prevalence in the world: first, that such notions are consistent with the familiar doctrines of the lower culture as to transmigration of souls and transformation of bodies; second, that certain insane persons do actually suffer under the delusion that this transformation (the idea of which popular belief has put into their minds) has really happened to themselves, and they prowl about like wild beasts accordingly. Mr. Wallace disapproves of this treatment of the subject, and propounds a view of his own, as follows: "A recognition of the now well-established phenomena of mesmerism would have enabled Mr. Tylor to give a far more rational explanation of were-wolves and analogous beliefs than he offers us. Were-wolves were probably men who had exceptional power of acting upon certain sensitive individuals, and could make them, when so acted upon, believe they saw what the mesmeriser pleased; and who used this power for bad purposes. This will explain most of the alleged facts, without resorting to the short and easy method of rejecting them as the results of mere morbid imagination and gross credulity."

Let me now first observe that Mr. Wallace's explanation does not supersede my suggestions; indeed, he meets neither of the points which I endeavour, however tentatively, to deal with. He offers nothing like a reason why knavish sorcerers in districts of Europe, Asia, Africa, and America should have all hit upon the device of imposing the same peculiar delusion upon their dupes; nor does he account for the fact, vouched for by satisfactory evidence, that in certain cases the supposed were-wolf is himself utterly persuaded of the reality of his own transformation, and goes to execution believing in his offence. The proofs are, I think, convincing, here as elsewhere in the history of magic, that sorcerers were originally and still are usually more or less believers in their own magical pretensions—though very many used and use fraudulent means to enhance their supposed powers; and some, who may be reckoned among the vilest of the human race, are simply professional impostors. Yet Mr. Wallace's suggestion, though it does not do away with the need of mine, seems to me valuable as a well-directed attempt to explain a part of the matter left untouched by me. His theory that a were-wolf may be a person possessed of the peculiar faculty exerted by mesmerists, of making others delusively imagine that they see and hear what in fact does not happen, is a theory at any rate plausible, and possibly on the track of explaining much of the power belonging to sorcerers, savage and other. (I may remark incidentally that the power of mesmerists in producing anæsthesia and working on the imagination of their patients has never been contradicted by me.) Now, without committing myself to Mr. Wallace's idea, beyond saying that it is plausible and worth pursuing, I proceed to apply it somewhat farther. Granting that a were-wolf, in virtue of being a person capable of exerting mesmeric influence, can delude people, and even assemblies of people, into fancying that they perceive monstrous unrealities, the

question arises, Was any one with this were-wolf-faculty present in the room when Mrs. Guppy made her celebrated aërostatic entrance? Is Mr. D. D. Home a were-wolf? Is a professional "medium" usually or ever a person who has the power of acting on the minds of sensitive spectators, so as to make them believe they see what he pleases? Pursuing this subject yet a step farther, I have now to call Mr. Wallace's attention to an interesting fact. The sorcerers of the Abipones of South America, who by mere roaring within their tents threw the credulous savages into agonies of panic terror, caused by vivid belief that tiger-spots were in the act of coming on their (the sorcerers') bodies, that their nails were growing into claws, that they were actually transforming themselves into tigers, deadly though invisible—these sorcerers were actually the professional spiritualistic mediums of the tribe, part of whose business it was to hold intercourse with the spirits of the dead, causing them to appear visibly, or carrying on audible dialogues with them behind a curtain. - Mr. Wallace, as the most eminent scientific man who has taken up what are known as modern "spiritualistic doctrines," no doubt has the ear of all who hold these doctrines. I think it may bring about investigations leading to valuable results if Mr. Wallace will inform spiritualists with the weight of his authority that he believes in the existence of a class of men who, in his words, have exceptional power of acting upon certain sensitive individuals, and can make them, when so acted upon, believe they see what the mesmeriser pleases, and who use this power for bad purposes.

With reference to other parts of Mr. Wallace's review of my work, I have to thank him for several valuable comments, while, at the same time, I venture to express an opinion that some of his objections to my ethnological treatment of spiritualism are unreasonable, and especially I wonder that so serious a student of natural science should make it a ground of complaint against me that in treating of difficult and important problems I consider it necessary to bring forward copious and widely distributed evidence. But rejoinders to reviews are seldom desirable in themselves, and my justification for the present note lies in the importance of drawing attention to a matter worth considering by persons on both sides of the spiritualistic controversy.

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## DREDGING EXPEDITIONS

THE occasion of an American Dredging Expedition recently starting, leads us to make the following remarks on such Expeditions in general, more especially upon one whose programme has lately come to our ears.

England has perhaps of all countries done the most for dredging. We have only to point to such names as Forbes, Ball, McAndrew, Wallich, Jeffreys, Wyville Thomson, and Carpenter, as among the landmarks in the cause. Indeed, for many years coast dredging has been a popular amusement with the marine naturalist and collector, and many a prize has been in this manner turned up.

In 1868 Messrs. Carpenter, Thomson, and Jeffreys were fortunate enough to obtain the use, free of expense, of a Government steamer, and, armed with a substantial grant from the Royal Society, tried their luck in the deep sea. The following year the Government again gave them the use of a vessel, and the Royal Society a further grant of 200*l.* Again in 1870 they went out at the country's expense. The great and important results obtained during these cruises are pretty well known to the scientific world, and it is unnecessary to repeat them here.

In the year last mentioned an unheard-of circumstance took place. An English yachtsman, Mr. Marshall

Hall, not only gave up the use of his yacht for the summer in the cause of Science, but bore nearly the whole expense of the cruise himself. The naturalist who accompanied them was Mr. Kent, of the British Museum, a man comparatively unknown before that time; and this was, perhaps, the reason why the Royal Society could only afford to give £50 towards the expense of apparatus, &c. As a natural consequence, the expedition was considerably crippled for want of proper gear, and they were unable to attempt deep-sea work. It is too rare for persons who are blessed with means to assist Science in any way, and when such an act of generosity does take place, it ought not to be forgotten on the part of the scientific public. Yet it is rumoured that a similar expedition to Morocco and Madeira, which Mr. Marshall Hall is arranging for the spring, is likely to be received with some coldness by some influential members of the scientific brotherhood. We sincerely hope that the rumour is incorrect.

It appears that Mr. Marshall Hall proposes to be absent from England for between three and four months; and, besides the natural history, to investigate, as far as possible, certain chemical and physical questions concerning the deep sea and its currents in the neighbourhood of the above-mentioned places. He is taking with him a young naturalist, Mr. P. T. Abraham, B.A., B.Sc., lately from Dublin, at which University he came out first in natural science honours, and where he has gained a high reputation for zoological knowledge. It is also probable that another naturalist will make up the staff. These gentlemen intend to give, besides the use of the yacht, 150*l.* or so—as much as they are able. The remaining 250*l.*—for the total cost of the expedition could not amount to much less than 400*l.*, when the items of gear, apparatus, outfit, and maintenance for such a time are taken into consideration—they hope to obtain in the form of grants from the learned societies. We feel sure that the Royal Society will be among the first to endow the work out of the fund placed at their disposal by the Government, and the best friends of Biology may wish that they had more frequent opportunities afforded them of assisting in researches in which it is fitting that in the first instance a private individual should come forward.

It is possible even that other societies may be induced to help if they have funds at their disposal. Among such societies we may mention the Zoological Society, which contains on its roll the names of men of the first rank in every department of zoology. It is true that a great portion of the funds are expended in the direction of the higher vertebrates, and that the lower animals do not receive the attention they may deserve; but still, it must be remembered that the great object of the society is the popularisation of natural history.

We hope that the *Norna's* will not be the only dredging excursion starting from British waters this year. The field that has been so ably opened up by Dr. Carpenter and his colleagues ought not to be allowed to slip away altogether from the hands of Englishmen. We know too well that other nations are not backward in following up and eclipsing the work that British pluck and genius have been the first to venture upon. The Americans are on the track, and our Continental neighbours will not be far behind.

We are glad that the extended circumnavigation expedition is in process, and we believe that if nothing unforeseen occurs, Prof. Wyville Thomson, with a staff of competent aids, will sail in the autumn on their long journey, which cannot fail to have the most important bearing on our future advance in such studies. Such a journey as this, however, instead of making more modest dredging operations of no avail, vastly increases their importance; and it is not too much to hope that the time is not far distant when men of money and leisure will more generally occupy their time in such pursuits.

### SOLAR HEAT

THE calculations presented by Pèrè Secchi, in his work "Le Soleil," relative to solar temperature and solar radiation, tending to discredit the result of recent investigations on the subject, I have carefully examined the "solar intensity apparatus," the indications of which form the basis of those calculations. This unique device will be found delineated on p. 267 of the work referred to, the accompanying illustration (Fig. 1) being a fac-simile of the same. It represents a longitudinal section through the centre line, thus described:—A B and C D are two concentric cylinders soldered one to the other; they form a kind of boiler, the annular space being filled with water or oil at any temperature. A thermometer, *t*, passes through a tube, across the annular space, to the axis of the cylinder; it receives the solar rays introduced through a diaphragm, *m n*, the opening, *o*, of which is very little larger than the bulb of the thermometer. A thick glass, V, closes the back part of the instrument, and admits of ascertaining whether the thermometer is placed in a direct line with the pencil of rays. The interior cylinder and the thermometer *t* are coated with lamp black. A second thermometer, *t'*, shows the temperature of the annular space, and consequently that of the inclosure. The whole apparatus is mounted on a support having a parallactic movement, to facilitate following the diurnal motion of the sun. The apparatus being exposed to the sun, it will be found, on observing the two thermometers, that their difference of temperature increases gradually, and that in a short time it ends by being constant.

Before pointing out the peculiarities of the contrivance thus described by Pèrè Secchi, it will be instructive to examine his "solar intensity apparatus," manufactured by Casella, represented in Fig. 2. The manufacturer publishes the following statement regarding this instrument:—"Two thermometers are here kept immersed in a fluid at any temperature, and a third surrounded by the same conditions, but not immersed, is exposed to the rays of the sun. The increase of temperature thus obtained is found to be the same, irrespective of the temperature of the fluid which surrounds it." No one acquainted with the principles which govern the transmission of heat within circulating fluids can fail to observe that the thermometers applied above the central tube will not furnish a reliable indication of the temperature of the fluid below the same, nor of any portion of the contents of the annular space towards the bottom. Apart from this defect, it will be perceived that an upward current of atmospheric air will sweep the underside of the external cylinder, causing a reduction of temperature of the fluid confined in the lower half of the annular space. Again, the heat radiated by the bulb of the thermometer exposed to the sun will elevate the temperature of the air within the central tube, and consequently produce an internal circulation tending to heat the upper part of the fluid contained in the annular space. The effect of the irregular heating and cooling thus adverted to will be considered after an examination of the result of some observations recorded in Table A conducted at different times during the month of September 1871. In order to insure an accurate position, the instrument during these observations was mounted in a revolving observatory upon a table turning on declination axes provided with appropriate mechanism and declination circle. An actinometer being attached to the same table, the true intensity of the radiant heat, as well as the sun's zenith distance, were recorded simultaneously with the indications of the Secchi instrument furnished by Casella. Let us first consider the tabulated observations of September 2 recorded at equal intervals of three minutes. The indication of the two thermometers immersed in the fluid contained in the annular space first claims our attention, since the temperature of this fluid is