

Association would always keep in view the possession by the lecturers of those qualities which alone could secure ultimate success in their enterprise, and which might be summed up as follows:—First, the fulness of knowledge which belongs to an accomplished master of his subject; second, the authority in statement which is derived from original research; and third, the disposition and power to convey full and accurate information to others with simplicity and clearness.

The subject of Prof. Roscoe's lecture was "The History of the Chemical Elements," and it was most completely and successfully illustrated, especially in the department of spectrum analysis.

Sir William Thomson's lecture will be on "The Tides," in which it is expected that a full exposition will be given of the more important results arrived at by the British Association Tidal Committee in their recent investigations.

Dr. Carpenter has chosen as his subject "Man not an Automaton," with reference to the recent lectures of Professors Huxley and Clifford; and the concluding lecture, by Prof. W. C. Williamson, will be on "The Dawn of Animal Life."

It is the intention of the committee in future sessions to provide courses of eight or ten lectures, embracing all those branches of science that are susceptible of being treated thoroughly before large and miscellaneous audiences. What the public now want is lectures of the highest class, conveying ample information, but without unnecessary technicality and learned difficulty. The success of the Manchester Science Lectures for the People and of the lectures delivered to the working men in the towns visited by the British Association during recent years, abundantly shows that such a desire is yearly becoming more and more prevalent. JOHN MAYER

#### ATLANTIC NOTES

##### *Migration of Birds—The Thresher and Whale*

IN crossing the Atlantic last September, when 900 miles distant from the nearest point of Newfoundland, two land birds settled on the ship, and after a short rest resumed their flight to the south-east, without partaking of the food which was scattered in various places for them. By the colour of their plumage and motion on the wing, I believe them to be a species of lark. It may well be asked whence did they come, and whither were they going over that vast space of ocean, with no resting-place nearer the continent than the Azores? How were they fed during their long journey, and what guided them on their course? for it is only reasonable to suppose they had come on a bee line from their starting point, and even then their muscular powers must have been severely taxed. It appears to me that naturalists are not in possession of the secret which enables birds of passage to go many days without food at a time when their system must be strained to its extreme limit of endurance.

From the result of close observation, I do not believe that land birds are often, if ever, driven to sea by the force of the wind. Some other cause must influence their movements. At the head of the Gulf of Bothnia, when there has not been a storm for many days, I have seen scores of different species around the ship, amongst them the hawk, the owl, the robin, and many others. Are those who alight and stay by the ship the stragglers from the ranks of the armies which annually migrate, the sick and worn who fall out by the roadside to die, whose end in creation has been fulfilled, and their places ready to be taken by the young and strong? This surmise is strengthened by the fact that no care can preserve the lives of these tired birds in captivity; the hawk and dove alike refuse food, and quickly pine and die.

Birds must possess strong affections, as they are always

seen in pairs on these long journeys, which is an additional argument in favour of their voluntary flight over the ocean. It is scarcely possible they could remain together in a gale sufficiently powerful to blow them off the land, and more unreasonable still to imagine that the strength which is able to carry them hundreds of miles without a rest should fail to breast an ordinary gale under the shelter of the land. Such facts as these vouch for the facility with which the most remote islands may increase the number of their species without the agency of man.

Off Youghal a gigantic thresher (*Squalus vulpecula*) was passed. It was leaping lazily and obliquely from the water, and after attaining its highest altitude, fell heavily on the surface, without making any effort to ease or guide its descent. This fish was not under fourteen feet in length; the belly of a pearly whiteness, and the back marked across with broad black bands. I have never seen this fish north before; but on the whaling grounds of the southern seas it is common. I do not believe it is dangerous to the life of the whale, as is often stated, but am under the impression that the irritation caused by the attacks of the thresher makes the animal vomit up the squid and other small matter on which it feeds. It is not reasonable to suppose that the blows inflicted by so small an instrument as the thresher's tail can have much effect through a foot of blubber. The whale has also many ways of escaping from its puny enemy; he dives to a depth where the thresher cannot follow, and if he could, his power of inflicting injury would be gone, owing to the resistance caused by the water; his speed also enables him to escape at all times. The treaty of offence which is said to exist between the thresher and sword-fish appears to me to be very mythical. When the whale is sick or dying, he is doubtless an object of attack to all the shark species, as they wage war with the whaler for the coveted blubber. WM. W. KIDDLE

#### THE TRANSIT OF VENUS

THE *Times* of yesterday contains some additional news from the Transit parties, specially those of France and Italy.

The French news consists of telegrams from Shanghai in the Northern and from New Caledonia in the Southern Hemisphere. From the former station M. Fleuriais, the astronomer in charge at Pekin, now states that he was fortunate enough to observe all the four contacts, and not two only, as was at first stated. The times were as follows in local mean time:—First contact, 21h. 32m. 42s.; second, 22h.; third, 1h. 50m. 15s.; fourth, 2h. 17m. 13s. Nor is this all; no less than sixty photographs were taken which M. Fleuriais pronounces good. We have already stated that stations in Northern China are most useful for the application of the Halleyan and direct methods. From New Caledonia the best part of the news refers to the photographic operations, 100 good photographs being secured. Of the contacts, only the interior one at ingress was observed.

The news of the doings of the Italians comes from the party in Bengal, in charge of the distinguished spectroscopist Tacchini, including Dorna, Lafont, Morso, Abetti, and Tacchini. The telegram comes from Maddapore, and the party evidently occupied two stations. The first three observed all four contacts, the last two only the third and fourth.

As before stated, the chief instrument employed by the Italians was the spectroscope—an instrument not recognised in the equipment of any of the English parties.

The observations were of the most satisfactory kind, and the results may lead to a most important discovery in solar physics. The time of interior contact at egress was observed with the most rigorous exactness, both by the

ordinary telescopic method and by the spectroscopic method described in our former notes. It was found that the difference between the times of observation by these methods was *more than two minutes*, contact being observed by the spectroscope first. Now, if the contact had been observed last by the spectroscope, there was an obvious condition of the observation to which the discord might have been attributed; but there is now no room for doubt that the sun's extreme edge which we actually see in a telescope differs physically from the part just within it, although there is no difference to the eye—in fact, that it gives a spectrum of bright lines, while the spectrum of the true subjacent sun gives a continuous spectrum with dark lines. Further, the physical difference to which we refer would probably tend to make this stratum variable in thickness and luminosity. Nay, we may already hazard the question whether there is not here a condition which may have something to do with the various times of contact recorded by observers having object-glasses widely differing either in aperture or in the over- or under-correction of the chromatic dispersion.

Another victory achieved by the Italians is the determination of the nature of the atmosphere of Venus. The ring round the planet, which in the former transits as in the present one was visible round Venus both on and off the sun, indicates in the spectroscope that in that planet, as in our own, the atmosphere is composed to a certain extent of aqueous vapour.

Mr. Proctor pointed out some time ago the great value of photographs taken at the Cape of Good Hope in combination with those secured at Nertschinsk and Roorkee. We have no information that any photographs were taken at the Royal Observatory at Cape Town, but a correspondent informs us that fourteen successful photographs were taken at Cape Town, two of them showing distinctly the black drop.

The *Times* then refers to the final appendices to the "Recueil de Memoires, Rapports et Documents relatifs à l'observation du Passage de Venus sur le Soleil," as enabling us at length to refer to the doings of the Commission appointed by the French Government. The records extend from February 1869, when the Government first moved in the matter, to a few months ago, when the final instructions on the methods to be adopted to guard the observations against risk of loss were issued.

The first action of the French Government was to ask the Academy of Sciences to consider the places to be occupied, and the number of observers; the instruments to be used; the additional researches which might be undertaken by the observers sent to the Southern Hemisphere; and, finally, whether an Astronomical Congress would not be desirable to bring about a uniform system of observations.

A strong commission was at once appointed, composed of mathematicians, astronomers, physicists, and chemists, in order that the problem might be considered in an efficient manner. Strangely enough, the name of M. Leverrier, the distinguished Director of the Paris Observatory, does not appear on the commission; he did not think the observations of the Transit necessary to prove the accuracy of his values of the solar parallax. Happily, his voice was overruled. The course taken, as the *Times* remarks, suggests how desirable some similar procedure here would have been.

"There are very many points of the greatest interest," the *Times* continues, "raised by the contents of this large volume to which we should refer did space permit; from beginning to end it shows how a nation should set itself to work—how all the intellect of a nation can and must be utilised, when a great problem involving many kinds of special knowledge has to be attacked. It is often said that in France science

is crushed by a dead weight of officialism, and that in England it is free. However true this may be of teaching, there is ample evidence in this volume that, in one branch of research at least, the very opposite of this statement is much nearer the truth, and the painful discussions which some time ago occurred in our own columns and elsewhere, the 'Appeals to America,' the action of the Board of Visitors of the Greenwich Observatory, and the like, afford a strong argument—if, indeed, one were needed—that the growth of science necessitates that in all future national enterprises of the kind the example of the French and of all the other Governments should be followed. In this way only, in our opinion, can the national scientific honour be upheld, while the officials concerned in carrying out the work would be strengthened in their positions and shielded from a responsibility too great for individuals to bear."

### NOTES

THE arrangements for securing observations of the Solar Eclipse of April 6 are progressing most satisfactorily, thanks to the energy of the Royal Society Committee and the varied knowledge that has been brought to bear upon the various points of attack. Lord Salisbury has brought the proposed action of the Royal Society before the Council of India, and such instructions have already been telegraphed to India as will probably result in this eclipse being observed with a wealth of observers and instrumental appliances beyond all precedent.

CAPTAIN NARES, who is to command the English Arctic Expedition, has arrived in London. Commander Markham returned on Saturday from Dundee, after having entered six good men, tried seal and whale fishers, as ice-quartermasters. Staff-Surgeon Thomas Colan, M.D., of the *Unicorn*, drill-ship of the Naval Reserve at Dundee, has been selected by the Admiralty as senior medical officer of the Expedition. With regard to the proposed German Expedition, the desire is, we believe, if the funds can be raised, to form a scheme of co-operation between the two exploring expeditions. Surely our brother Teutons, richer now than ever they were, and whose zeal for knowledge is proverbial, will not allow this splendid scheme to be marred for lack of funds.

THE Museum of the Royal College of Surgeons contains a series of casts of the interior of the cranial cavity, representing exactly the form and size of the brain (when covered by its membranes), of men of various races, and of many species of animals. With a view to diffuse the information to be derived from the study of these casts, and believing that many educational institutions will be glad to avail themselves of the opportunity of possessing them, the Council of the College has authorised the issue of copies at the lowest price at which they can be reproduced, which will partly depend upon the number likely to be required. The Conservator of the Museum would like those who desire to possess the whole or part of the series, which comprises many rare forms, to communicate with him on the subject.

AT its *séance* of Jan. 11, the Paris Academy elected a corresponding member in the section of Mechanics, in place of the late M. Burdin. Three candidates were proposed—M. Broch, the Norwegian mathematician, who obtained twenty-four votes; Prof. Stokes, F.R.S., twenty-one votes; and M. Calladon, one vote. Thus M. Broch was elected by only three votes over Prof. Stokes.

MR. SIMON NEWCOMB, the American astronomer, is now in Paris. He has paid a visit to the Observatory, in order to inquire into the possibility of constructing a large refracting telescope having a lens of one metre in diameter. A sum of