

tion prominently alluded to by himself *is the last* publication. As respects myself, I have printed no further particulars in addition to those which the Professor dismisses, briefly for the present, with the announcement of having discovered, "total contradictions" to certain "conspicuous features."

3. It is necessary to point out, that the designation for my observations adopted by the Professor of "the Royal Society's and Mr. Hennessey's high-sun series" suggests existence of the *divided* responsibility which is plainly disavowed in the "Advertisement" to the *Philosophical Transactions*, 1875, Part I., and elsewhere; for the professor can hardly intend that two separate and independent high-sun series taken on the Himalaya Mountains, one by the Royal Society, and the other by myself, have appeared in the *Transactions*.

4. I shall look forward with interest to the perusal of Prof. Piazzi Smyth's promised *complete* account of his sun-high observations at Lisbon; meanwhile I may be pardoned for my inability to follow his prompt and brief announcement of "total contradictions," written while yet on his return voyage.

J. B. N. HENNESSEY

N.W. Provinces, India, Dehra Doon, October 3

Singing Mice

PERHAPS the following account of a singing mouse may be of interest to your readers:—

Last winter we occupied the rooms we now do at Menton. Early in February we heard as we thought the song of a canary, and fancied it was outside our balcony; however we soon discovered that the singing was in our *salon*, and that the songster was a mouse; at that time the weather was rather cold, and we had a little fire, and the mouse spent most of the day under the fender, where we kept it supplied with bits of biscuit; in a few days it became quite tame, and would come on the hearth in an evening and sing for several hours, sometimes it would climb up the chiffonier and ascend a vase of flowers to drink at the water, and then sit and sing on the edge of the table and allow us to go quite near to it without ceasing its warble; one of its favourite haunts was the wood basket, and it would often sit and sing on the edge of it. On February 12, the last night of the carnival, we had a number of friends in our *salon*, and the little mouse sang most vigorously much to their delight and astonishment and was not in the least disturbed by the talking. In the evening the mouse would often run about the room and under the door into the cotridor and adjoining rooms, and then return to its own hearth; after amusing us for nearly a month it disappeared, and we suspect it was caught in a trap set in one of the rooms beyond. The mouse was small and had very large ears, which it moved about much whilst singing; the song was not unlike that of the canary in many of its trills, and it sang quite as beautifully as any canary, but it had more variety, and some of its notes were much lower, more like those of the bullfinch. One great peculiarity was a sort of double song, which we had now and then—an air with an accompaniment; the air was loud and full, the notes being low and the accompaniment quite subdued. Some of our party were sure that there was more than one mouse until we had the performance from the edge of the wood basket, and were within a yard or two of it. My son has suggested that many or all mice may have the same power, but that the notes are usually so much higher in the scale that, like the cry of the dormouse and the bat, they are at the verge of the pitch to which the human ear is sensitive; this may be so, but the notes of our mouse were so low and even the highest so far within the limits of the human ear, that I am inclined to think the gift of singing in mice is but of very rare occurrence.

JOSEPH SIDEBOTHAM

Hotel de Menton, Menton, S. France, October 31

SEVERAL years ago I received some of these animals from a friend, and kept them in confinement for one or two months. The description which your correspondent gives of their performance leaves very little to be added by me, as in all respects this description agrees perfectly with my own observations. I write, however, to remark one curious fact about the singing of these mice, namely, that it seemed to be evoked by two very opposite sets of conditions. When undisturbed, the little animals used for the most part to remain quiet during the day, and begin to sing at night; but if at any time they were alarmed, by handling them or otherwise, whether during the day or night, they were sure to sing vigorously. Thus the action seemed to

be occasioned either by contentment or by fear. The character of the song, however, was slightly different in the two cases.

That these mice did not learn this art from singing birds there can be no doubt, for they were captured in a house where no such birds were kept. It may be worth while to add that this house (a London one) seemed to have been suddenly invaded, so to speak, by a number of these animals, for although my friend has lived in this house since the year 1862, it was only during a few months that singing mice were heard in it, and during these few months they were heard in considerable numbers.

Regent's Park, November 1

GEORGE J. ROMANES

Meteor

THE following account of a meteor seen here may perhaps interest some of your readers:—

On October 29, at 8h. 1m. 30s. Greenwich mean time, a brilliant meteor exploded in right ascension 268°, declination + 60° (equator of 1855); it left a bright crooked train scarcely half a degree long, which remained visible for about ten seconds, and pointed towards ξ Draconis. The course of the meteor must have been directed downwards, almost exactly towards this observatory. The flash of the explosion was seen by the assistant-astronomer, Mr. Lohse, although he was sitting in such a position as to be unable to see the meteor directly.

Lord Lindsay's Observatory,
Dunecht, Aberdeen, November 3

RALPH COPELAND

INTERNATIONAL POLAR EXPEDITION

IN February, 1875, when the Arctic Expedition was being prepared, I asked the First Lord of the Admiralty, in Parliament, whether, in view of the small value for scientific purposes of isolated observations in the Arctic regions, in comparison with simultaneous observations at different places, and in view, also, of the interest now taken in Arctic science by foreign Governments, he would postpone for one season the departure of the proposed Arctic Expedition, and in the interval communicate with foreign Governments with a view to the organisation of other expeditions to make observations simultaneously with our own at fixed times? The First Lord said that he considered the preparations for an expedition too far advanced to admit of this, and added: "I should regard the project of combination with other powers to attain the objects in view as one beset with difficulties"—in which, I think, he was in error. In the following month, when the Supplementary Estimate for the Arctic Vote was under discussion, I again drew the attention of the Government and Parliament to the advantages of simultaneous Arctic expeditions (see *Hansard*, vol. ccxxii. p. 1354), and in *Naval Science* for April of the same year, in an article on "Foreign Polar Expeditions," I drew still further attention to the matter, concluding with an extract from a paper by Capt. Weyprecht (who so greatly distinguished himself in the Austro-Hungarian polar expeditions of 1871 and 1872-74), in which he pointed out in the clearest manner the desirability of extending future Arctic researches far beyond mere geographical exploration, and pressing forward with our studies of magnetism, electricity, the best of meteorology, &c. "The solution of these questions cannot," he said, "be expected until all nations which claim to come up to the present high standard of civilisation unite to go hand in hand, setting aside all national rivalries. To bring about decisive scientific results it will be necessary to make a number of simultaneous observations, so conducted that they will furnish a yearly *résumé* of observations made in different parts of the Arctic regions with exactly similar instruments, and from exactly similar instructions."

Upwards of a year ago NATURE gave details of Weyprecht's project for the scientific exploration of the Polar regions. It was referred to on several occasions, and pointed out that Weyprecht's plan was the only satisfactory method of obtaining results of real and permanent value.

The programme has now been extended and completed, and was prepared for submission to the International Meteorological Congress which was to have met at Rome in September, but which has been adjourned to next year. I have just received from my friend Weyprecht a copy, and may summarise its contents as follows:—

The enterprise proposed by Count Wilczek and Capt. Weyprecht has for its aim strictly scientific exploration, purely geographical discovery being a secondary matter. It will be the first step towards a systematic scientific investigation of the regions around the poles of the earth and the minute observation of phenomena peculiar to these regions—phenomena the earnest investigation of which is of the highest importance in connection with a great number of problems with regard to the physics of the globe. The international expedition will have for its aim to make in the Arctic and Antarctic regions, or in the neighbourhood of these regions, and at as many stations as it is possible to establish, synchronous observations according to a programme mutually agreed upon; for the purpose, on the one hand, of deducing by comparison from observations collected at different points, independently of the peculiarities which characterise the years of different observations, the general laws of the phenomena investigated; and, on the other hand, of arriving by probable inductions at a knowledge of the chances of penetrating further into the interior of the unknown regions. For this purpose each of the states participating in the work will undertake to equip at its own expense, and send out an expedition to one of the points designated. Each state will of course be at liberty to authorise its expedition to carry on work outside of that mutually agreed on.

The investigations to be made in common bear only on meteorological phenomena, those of terrestrial magnetism, aurora borealis, and on ice phenomena. At each station the observations must be continued one year, from September 1 to August 31. The meteorological observations will be made in conformity with the resolutions of the permanent International Committee, and will relate to atmospheric pressure, the temperature and humidity of the air, the direction and force of the wind, the state of the sky and its degree of clearness, and also to phenomena of condensation. The programme then gives detailed instructions as to methods and instruments of observation, all being arranged to secure accuracy, fulness, and uniformity.

It is probable that each station will be near a coast, and one of the chief objects of the expedition will be to observe the connection between the movements of the ice and the winds and currents, and if these are observed regularly, important results will no doubt be obtained as to the movements of the ice in the Arctic regions, and therefore as to the routes most favourable for reaching the pole. The best ice-observations will of course be at those stations where local conditions have the least influence.

The magnetic observations are divided into absolute determinations and determinations of the three elements. Minute directions are given in the programme as to the method to be followed in taking these observations, the fixing of the positions of the various instruments, the kinds of instruments to be used, the methods of verification and testing, the construction of observatories, &c. These directions, if faithfully carried out, would give the observer plenty of work to do, but the result would be of unprecedented value. In consequence of the persistent perturbations which prevail in these regions, isolated readings made only from hour to hour, even when carried on for long periods, are not sufficient to give with precision the hourly, daily, and monthly magnetic character of the place of observation. It is necessary, consequently, to multiply these observations. Ten obser-

vations per hour for each of the three elements will be sufficient, and to insure a rigorous synchronism it is stipulated that the three instruments of variation be read during ten minutes, from minute to minute, viz., at the full minute (— h. 56m. os.) the declination, ten seconds after (— h. 56m. 10s.) the horizontal intensity, and ten seconds after that (— h. 56m. 20s.) the inclination. Before and after each observation, viz., — h. 52m. os., and at — h. 69m. os. the form and position of the aurora should be noted. Immediately after the meteorological observations should be proceeded with in the following order:—Temperature, humidity, winds, clouds, atmospheric pressure. (For magnetic observations it is proposed to use Göttingen mean time.) Besides observations of the regular magnetic variations, it will be of great importance to have made, by three observers, rigidly synchronous readings of the three elements in order to obtain precise data of the total intensity. For this purpose there will be made, during one hour each day, by these observers, from minute to minute, from — h — m. os., readings of the three instruments. The hours of these observations should be advanced an hour each day, so as to return to the point of departure at the end of every twenty-four days.

The aurora should be observed as to their form, their intensity, and their position. The programme then names and describes the various forms assumed by aurora—arches, streamers, beams, corona borealis, haze, waves, flashes—for the adequate and scientific observation of which the programme gives directions.

The most favourable time for this joint expedition will be October and November, when the temperature is not so low as to necessitate special preparations.

As the absolute simultaneity of the observations is of the utmost importance, each station must be furnished with the means of obtaining the exact longitude; good chronometers will also be necessary. To carry out the above observations to their fullest extent, four observers will suffice for each station, if among the subordinates there are men who can perform the purely mechanical duty of reading the instruments.

The programme concludes with three propositions, the purpose of which is to insure the possibility of the exact comparison of the magnetic observations.

The following are the points proposed as most favourable for the various observations referred to above:— In the northern hemisphere—The north coast of Spitzbergen; north coast of Novaya Zemlya; Finmark, near the North Cape; the mouth of the Lena, on the north coast of Siberia; New Siberia; Point Barrow, on the north-east of Behring Strait; the west coast of Greenland; the east coast of Greenland, about 75° N. lat. In the southern hemisphere—The neighbourhood of Cape Horn; the Kerguelen or Macdonald Islands; one of the groups south of the Auckland Islands.

I wish that in the influential pages of NATURE this great international scientific subject could be again urged. I cannot help thinking that in the present Hydrographer of the Navy we have an officer who would be at once most able and willing to take part in giving, in the way suggested, true scientific direction and scope to future Arctic research. My confidence in the great value of simultaneous observations in comparison with the meagre results of isolated expeditions must be my apology for thus writing.

E. J. REED

THE NORWEGIAN DEEP-SEA EXPEDITION

FROM soundings taken by the second German Polar Expedition, and kindly communicated by Capt. Koldewey, of Hamburg, I have been induced to alter