

while heavier rain will be prevalent in the north-west. It will be interesting to compare this prediction with actual results; but at present we are more concerned to point out the care that is taken in preparing the forecast, the difficulty in the collection of exact data, and the manifold determination to make the best use of all available sources.

This scrupulous care is well illustrated in the second class of information incorporated into the weather prediction, and which rests on the abnormal features of the recent meteorology of India. To discuss these with any prospect of success, it is first necessary to determine correct normals. The work that this involves can only be appreciated by those who have been actually concerned in a similar inquiry, but it is a method of investigation into which Mr. Eliot and his predecessor, Mr. Blandford, have thrown themselves with signal success. The volumes of the Indian Meteorological Memoirs bear witness to the ability and zeal with which the work has been carried on throughout some twenty-five selected observatories. We may well express the hope that so much work is now yielding abundant fruit.

THE PRESENT POSITION OF THE INVESTIGATION OF THE MALARIAL PARASITE.

THE rôle played by the mosquito as a carrying agent of the malarial parasite from man to man seems to be restricted to one genus, the *Anopheles*. Major Ross, of the Liverpool School of Tropical Diseases, in a telegram from Sierra Leone, announces the fact that he has found the *Anopheles* there, and that it may be the intermediary host of the quartan malarial fever.

Many observers in different countries, noticing the fact that malaria is most prevalent at the most active period of mosquito life, have attributed malaria to the agency of this insect. Dr. Patrick Manson, in 1894, first brought the subject forward in England, and, acting on his suggestion and advice, Major Ross undertook an investigation in India.

In 1897, by using two species of *Anopheles*, Ross traced the malarial parasite into the wall of the stomach of the mosquito after it had fed on patients whose blood contained the crescentic gametocytes; the next year he succeeded in tracing the complete life-history of the proteosoma *Grassii Labbé* of sparrows, and showed that its intermediary host was one particular kind of mosquito, the *Culex pipiens*. The gametocytes contained in the red blood corpuscles of the vertebrate host pass with the blood into the stomach of the mosquito, and passing through the stomach-wall bulge into the body-cavity; here a sexual process takes place, zygotoblasts are eventually formed, which pass into the insects' blood, and finally find their way into the salivary gland and to the duct leading from this to the extremity of the stylet; from here they escape into the blood of the vertebrate host when the insect bites. A full account of the process is given by Ross in NATURE of August 3.

Following on these results, Grassi in Italy attacked the problem from another point of view; he studied the mosquitoes prevalent in the different parts of the country where malaria occurs. The results were interesting. He found there was no indigenous malaria where the *Culex pipiens* was common, but it did occur where the large mosquito *Anopheles* was found.

Bignami and Bastianelli, who had been trying unsuccessfully to infect a man by allowing mosquitoes to bite him, attributing their want of success to the use of the wrong kind of mosquito, and, acting on the observations of Grassi, tried again with some mosquitoes imported from a malarious district. This time they succeeded in infecting the man with malaria of the same type that prevailed in the district from which the mosquitoes came. More-

over, they have shown that the development of the human form of parasite in the body of *Anopheles* is identical with the development of the proteosoma of birds in *Culex pipiens*, as observed by Ross.

According to these observers, the species *Anopheles claviger* is the most common intermediary host of the parasite of malaria in Italy, the tertian and summer-autumn types.

It is evident that the next step in the study of malaria should be to hunt for the different species of *Anopheles* and see if these are the intermediary hosts of the different types of malaria throughout the world, and what particular species is most concerned in transferring the parasite from man to man. Grassi has done this for Italy, and now we hear that Ross has found a species of *Anopheles* to be concerned in the transference of quartan fever; thus all the types of malarial fever are now referred to the *Anopheles* as their intermediary host. His full report on return from Africa will be read with interest.

Whether the *Anopheles* can be extirpated from a locality, and by what means, will be the problem for scientific workers resident abroad to settle; fortunately they seem to be confined to small areas, so the suggestion of Ross to draw off the water from stagnant pools may not be so hopeless a task as it would at first appear.

NOTES.

THE following men of science have been elected fellows of the Reale Accademia dei Lincei. As ordinary fellows: for mathematics, P. Tardy, G. Veronese; for mechanical science, G. Favero, G. Colombo, V. Volterra; for agricultural science, A. Targioni-Tozzetti. As corresponding fellows: for mathematics, G. Ricci; for mechanics, G. A. Maggi; for physics, G. Grassi, A. Battelli; for crystallography and mineralogy, A. D'Achiardi; for botany, F. Delpino; for agriculture, A. Borzi; for pathology, E. Marchiafava. As foreign fellows: for mathematics, G. Mittag-Leffler, J. Weingarten; for physics, E. Mascart, W. Kohlrausch; for chemistry, Ludwig Mond, E. Fischer; for crystallography and mineralogy, C. Klein, F. Fouqué, F. Zirkel; for geology and palæontology, O. Torell, A. De Lapparent, R. Lepsius; for botany, W. Pfeffer; for zoology and morphology, E. Haeckel, E. van Beneden; for physiology, E. Pflüger, E. Hering.

THE Berlin correspondent of the *Times* reports that the Imperial Government has ordered Prof. Kossel, of the Board of Health, to proceed to Lisbon and Oporto to study the plague and the methods adopted to combat it. Prof. Kossel will be accompanied by Prof. Frosch, of the Berlin Institute, for the Study of Infectious Diseases, who is being despatched on the same mission by the Prussian Government. Drs. Calmette and Salinbeni are already investigating the outbreak, and will report upon it to the Paris Pasteur Institute.

PRINCE KROPOTKIN sends us a note which suggests that the movements of sea-gulls along the British coasts may indicate forthcoming weather changes. On Saturday, August 26, while off Broadstairs, he noticed several flocks of gulls flying along the coast towards Dover. The wind was then blowing from the north-east, as it had been doing throughout August, and there was little indication of a change; but an old fisherman remarked that the gulls which had stayed on the coast at Margate and to the west of it were moving to the south coast to meet a south-west wind, which was sure to come. As is known, the change occurred on the following day, and the wind veered round to the south-west. In connection with this observation, it is worth remark that Mr. Inwards, in his "Weather Lore," says: "The arrival of sea-gulls from the Solway Firth to Holywood, Dumfriesshire, is generally followed by a high wind and heavy rain from the south-west."