enables it to adapt itself to the most diverse conditions, and a strong capacity for synthesis. These symbiotic bacteria come in with the food from the extra-organismal environment, and, though the partnership they form is usually indissoluble, they may in certain circumstances rejoin their wild relatives and live an independent life.

Every naturalist knows that lichens are double organisms, due to the symbiosis of algoid and fungoid partners, which form a very effective unity. Prof. Portier maintains that all organisms except bacteria have in a similar fashion a dual nature. A theory somewhat like this was propounded by Mereschowsky in 1910. But if all cells are thus dual, why, one hastens to ask, have not the ubiquitous, symbiotic, intra-cellular bacteria been seen before? The answer is that they have been often seen, but persistently misinterpreted. They are the components of the mitochondrial apparatus, those minute formed bodies, with many an alias, which have been described in the cytoplasm of all sorts of cells. It is true that these mitochondria have often been credited, with more or less probability, with a definite functional *rôle* in the metabolism of the cell, a *rôle* differing from cell to cell; but are not the symbiotes very plastic? Prof. Portier is good-humoured enough to quote the paradox that a theory is not of value unless it can be demonstrated false. We have no hesitation in prophesying that his theory will attain that value—which is just what he would have said himself a few years ago. We are bound to admit that the author is a downright good sportsman.

LETTERS TO THE EDITOR.

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The Magnetic Storm of August 11–12, 1919.

ONE of the very great magnetic storms, the most violent recorded at this observatory since that of September 25, 1909, commenced quite suddenly at 6.50 G.M.T. on August 11 from a very slightly agitated normal curve in both the elements of declination and horizontal force. The H magnet increased sharply by 84 γ (1 $\gamma \equiv 10^{-5}$ C.G.S. unit), and the D magnet swung 10′ to the west. The direction of motion in each element was immediately reversed, with a very rapid decrease of 113 γ in H, and a swing in D, equally rapid, to the east of 16′. After a few very rapid swings the spot of light due to H decreasing went off the recording drum at 7 a.m., and remained off until it returned at 7.24 G.M.T. At 8.12 G.M.T. H increased rapidly, the range of the swing exceeding 446 γ. At 8.50 G.M.T. it again decreased rapidly, the spot of light remaining off the recording drum until 9.43 G.M.T. These oscillations in H were accompanied by rapid swings in D. After its sudden increase and decrease at the beginning of the storm it swung 60′ to the west. At 8.52 G.M.T. it was 50′ in the opposite direction. The extreme range in D during the storm was 110′, and of H, since the spot of light travelled off the drum on either side, greater than 780 γ.

The greatest phase of the storm was between the hours 14 and 20 G.M.T. on August 11. The spot of light with increasing H was twice off the drum, from 15.36 to 16.10 and from 16.20 to 16.38 G.M.T. At 20 G.M.T. the oscillations of H were less rapid, but they recommenced, after a comparative lull, at 0.50 G.M.T. on August 12. At 1.38 G.M.T. a fine peak of decreasing H began, which was followed by a peak of increasing H at 3.15 G.M.T., the total range being 404 γ. Corresponding with this movement D showed a very fine peak of swing to the west, with a range of 66′, at 1.48 G.M.T. These oscillations in both elements, particularly at the beginning and at the maximum phase of the storm, were extremely rapid.

These rapid oscillations were succeeded for a period of about five hours by a violent shivering of relatively small amplitude, but of great rapidity, in both H and D. This phenomenon of so marked a type I cannot recall to have seen in former storms. After this, at 8.30 G.M.T., August 12, the swings became slower and smaller in amplitude on the whole, until the storm died quite abruptly in H, and less marked, though abrupt, in D, at 19 G.M.T. on August 12.

The *Times* for August 12 announced that the Minister of the Interior in Spain had notified the Press of a breakdown in telegraphic and telephonic communication on the preceding day. The postal authorities in this district were also inconvenienced on the same day by earth currents. Needless to add that the solar surface has been greatly disturbed by sun-spots lately.

I looked out for a possible display of aurora on the night of August 11, but the brightness of the moon effectually veiled any such appearance, even if it were present. The cirrus clouds, however, were arranged in streaks, seemingly radiating from the north-west. I have noticed such an arrangement of the cirrus clouds in former magnetic storms.

A. L. CORTIE, S.J.

Stonyhurst College Observatory, August 14.

Wild Birds and Distasteful Insect Larvæ.

I HAVE read the letter of the Hon. H. Onslow (NATURE, August 14, p. 464) with much interest, and I shall certainly continue the investigation as soon as opportunity offers.

I regret that I must disagree with the attitude adopted by Mr. Edward R. Speyer (NATURE, August 7, p. 445). In my letter on the subject I had no intention of refuting the observations of Prof. Poulton or of any other observer. I simply recorded what I had seen, and suggested that parasitism of the larvæ might afford an explanation, but Mr. Speyer introduces a condition which certainly did not exist in the spring of 1918. He writes:—"In times of stress birds have long been known to subsist upon insects with highly distasteful qualities"; and again: "The currant-moth larva . . . has merely been eaten by the thrush, and possibly by the other birds mentioned . . . when the stress of having to feed a family has made such a practice a necessity."

At the time my observations were made there was no necessity for the birds to feed upon these larvæ. Insect larvæ of all kinds were seldom, if ever, more numerous. There were an abundant supply and a great variety. The currant-moth larvæ were probably the most numerous, and with such an ample supply of food the birds fed upon them.

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