fir cones and extracting the seeds. His observations on the habits of the water-ouzel, its procedure under water, and the food it seeks there, quite redeem that lively little bird from the imputation of being a destroyer of salmon-spawn, and prove him to be the salmon fisher's best friend. But, indeed, the charms of Mr. Knox's book are many, and will be deemed an acquisition by all who take an interest in British zoology; to those who are both fishers and naturalists it will afford a rich treat. The tail-piece to the book is a beautiful woodcut of a salmon, having underneath the punning legend, "*In spe vivo.*"

Physical Geography. By Sydney B. J. Skertchley, F.G.S., H.M. Geological Survey. (London: Thomas Murby.)

THIS is one of "Murby's Series of Science Manuals" intended for use in schools. It seems on the whole creditably done, the information conveyed is valuable, and in the main trustworthy, the author occasionally drawing on his own experience for illustration. Amid the many manuals on the same subject competing for favour this deserves to take a place, though the few illustrations introduced are wretched, and there is an occasional attempt at fine writing.

Révue Photographique des Hôpitaux de Paris. Publié par Bourneville et A. de Montméja. 4ème Année. Avril, 1872. (Paris: Delahaye.)

THIS enterprising little publication deserves success. The number before us, which, however, is only interesting to our medical readers, contains three photographs (about 4 in. by 3 in.), one of a calcified enchondroma, and two of a remarkable case of encephalocele. One of these exhibits the whole infant, the other the upper part of the trunk. The details are very clearly visible, and there is an account of the case by P. Budin. The *Révue* contains also a good report of recent anatomical physiological and surgical work.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

The Potato Disease

I FEEL very much interested in the attempt you have made to connect the potato disease with cosmical phenomena, and I quite agree with you that although the *Peronospora* may be the proximate cause, yet for the ultimate cause we may have to look to a very different set of circumstances.

The researches of Baxendell, Meldrum, Smyth, and others, go to show that the convection currents of the earth are influenced by the state of the solar surface. Now surely anything that influences the motions of our atmosphere may readily be supposed to influence the distribution and activity of those disease germs that are now believed to be present in the atmosphere. Are not various kinds of blight associated with the prevalence of certain winds?

In referring to the five great visitations of the sweating sickness you say quite truly that we have no means of ascertaining the condition of the surface of the sun during those years. Nevertheless, *indirectly*, we may, I think, come to some sort of conclusion more or less probable regarding the sun's surface in those years.

This may, perhaps, be done by means of records of the Aurora Borealis. I have not access at present to the great catalogue of M. de Mairan, and I will, therefore, confine myself to the list of auroral appearances given by Mr. Jeremiah in your columns for November 17, 1870. Very great and extensive auroral outbursts are known to occur during years of maximum sun-spots, and auroræ are phenomena which appeal too much to the imagination to remain unnoticed in an unscientific age.

If, therefore, we can tell the years of very great auroral outbursts, we can at least approximate to those of maximum sun spots.

Now (quoting from NATURE) "in 1574 Camden and Stow inform us that an Aurora Borealis was seen for *two* successive nights, viz., the 14th and 15th of November, with appearances similar to those observed in 1716, and which are not commonly noticed. The same phenomenon was twice seen in Brabant in 1575, viz. on 13th February and 28th September, and the circumstances attending it were described by Cornelius Gemma, who compares them to spears, fortified cities, and armies fighting in the air." This has every appearance of a widely extended and great series of outbursts, and we may, perhaps, suppose that the maximum was not far from 1575.

Again we learn that "on September 2, 1621, the same phenomenon was seen all over France, and it was particularly described by Gassendus in his 'Physics,' who gave it the name of the 'Aurora Borealis.' Another was seen all over Germany in November 1623, and was described by Kepler." Giving equal weight to these two appearances, we may place the maximum in the year 1622.

Again we learn that "in 1707 Mr. Neve observed one of small continuance in Ireland, and that in the years 1707 and 1708 this sort of light had been seen no less than *five* times." We may in this case place the maximum in the year 1708.

We have thus selected as years of maximum auroral disturbances the years 1575, 1622, and 1708, and if they correspond approximately with years of maximum sun spots, we should expect the distances between them to be divisible by 11·1, which Wolf as well as De La Rue, Stewart, and Loewy, agree in representing as the solar period. Now the difference between 1575 and 1622 is 47 years—a period not very different from four solar periods, or 44·4 years.

Again the difference between 1622 and 1708 is 86 years—a period not very different from eight solar periods, or 88·8 years. Furthermore the difference between 1575 and 1708 is 133 years—a period not very different from twelve solar periods, or 133·2 years.

Finally the difference between 1708 and 1816·8, the period of one of Wolf's well-ascertained spot maxima, is 108·8, which is not very different from ten solar periods, or 111·0 years.

Assuming, therefore, that 1575 is not far from a period of maximum sun spots, and going backwards by steps of 11·1 years, we are led to the following dates:—1552·8, 1530·6, 1519·5, 1508·4, 1486·2, as years of maximum spots, whereas the dates of sweating sickness were 1551, 1528, 1517, 1506, 1485, and the differences between the two sets are as follows: 1·8, 2·6, 2·5, 2·4, 1·2, the mean being 2·1 years, and the difference always in the same direction.

It is, of course, hazardous to place much confidence in these results; nevertheless, it is worthy of remark that the greatest difference between observation and calculation from hypothesis, recorded in the communication, is 2·8 years, whereas it might sometimes have been 5·6 years on the supposition that there is no truth whatever in the hypothesis.

I shall only remark in conclusion that when we have arrived at the position of being able to explain by a probable hypothesis the cause of spot variations, we may perhaps be able to test our conclusions by means of these early notices of the Aurora Borealis.

B. STEWART

HAVING been from home, it is only now that I have read your very interesting article of Sept. 12, on the Potato Disease.

It is certainly most desirable that "an investigation into the origin, cause, and remedies" thereof by the ablest of our scientific men should be promoted; but it appears to me that this is a case for private contributions rather than an appeal to Government. I would, therefore, suggest that a fund be raised by subscription to supply the means of offering three prizes for the above object: the first I should hope would not be less than 500*l.*, the second and third 300*l.* and 200*l.*

These sums would offer an inducement to the ablest men to devote to the object a portion of that time and talent which, with many of them, forms the chief (sometimes the only) source from whence their income is derived.

The judges might be appointed by such of the subscribers as could meet at a given place after due notice.

The sum required, including expenses of advertising, &c., would not be large; there ought to be no difficulty in raising it when we consider what a large interest is at stake.

I should be happy to subscribe 5*l.*

Richmond, Surrey, Sept. 23 M. MOGGRIDGE