

LETTERS TO THE EDITOR.

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Flights of Rooks and Starlings.

I MAY be writing of what is so commonly known to naturalists as to be unworthy of record; the facts, however, are new to me. On a fine, still day last September I observed a large flight of rooks attended, as Gilbert White notes, by starlings. As they passed across the sky both rooks and starlings mounted higher and higher until they were lost to sight in the distance. Whatever may have been the occasion of the concourse, it was a subject of much interest to rooks in general, for solitary birds hurried by, cawing loudly, to join the main body. These belated individuals mounted in fairly regular spirals.

About a fortnight later I had the good fortune to be able to follow with powerful glasses a similar flight, but of rooks unaccompanied by starlings. As before, the mean movement in the still air was a steady oblique ascent, and the general impression that of a crowd of birds the individual movements of which were confused and irregular. This impression of confused flight was, however, probably wrong, for the few individual birds I was able to follow were undoubtedly rising in fairly regular spirals.

The surprising and, to me, novel character of the flight did not appear until the birds had risen to a height beyond the limits of unaided vision. The movements of individual birds then changed from the even sweep of the spiral to what can only be called trick flying. The wildest antics were indulged in, the commonest being a dive with closed wings, the bird sometimes rolling over and over. I could not fit the character of the movement to the hypothesis that the birds were darting after insects on the wing.

The two facts new to me were the height attained and the fact that a bird of such sedate manners as the rook should on occasion condescend to do "stunts."

W. B. HARDY.

The Athenæum Club, Pall Mall,
February 4.

National Union of Scientific Workers.

THERE is appearing in your advertising columns an announcement relating to this Union; will you allow me space to explain its objects very briefly, but rather more fully than is possible in an advertisement?

There is a general agreement that it is imperative for the best interests of science that those who pursue it should possess greater political and industrial influence. The founders of our Union believe that they can attain that influence only by adopting the form of organisation which has proved effective in experience. That organisation involves the formation of a Union including, so far as possible, every professional scientific worker, and governed in a completely "democratic" fashion. It is such a Union that we are trying to form.

In the pamphlet for which everyone is urged to write further details of our aims and methods of attaining them are suggested. But we feel that no self-appointed body can possibly legislate permanently for a Union designed to embrace the whole world of science. Our immediate endeavours, therefore, are to set up a preliminary organisation which will lead to the summoning of a thoroughly representative general meeting having the authority necessary to set the Union

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on a permanent basis. The pamphlet is mainly devoted to an account of this organisation. Until it has done its work the constitution and policy of the Union will remain unsettled; we would urge accordingly that any divergence, except on the fundamental principle, from the views of the founders is an argument for, rather than against, taking part in the preliminary work.

One last point. We are often asked what is our attitude towards other societies, existing or proposed. Our answer is that, since none of them are both all-inclusive and democratically governed, none, according to our view, can do our work. But, of course, we recognise that there are other ways of advancing the cause of science which are being followed effectively by other bodies. We recognise further that our relations to these other bodies will need careful consideration and regulation; but to discuss exactly what the relations must be would be to exceed the space I can ask you to put at my disposal.

NORMAN R. CAMPBELL
(General Secretary N.U.S.W.).

North Lodge, Queen's Road, Teddington.

THE GREEN LEAF: ITS SCIENTIFIC AND ECONOMIC EXPLOITATION.

THROUGHOUT the unnumbered ages which I have witnessed the rise and fall of successive civilisations upon this planet, the one thing that has stood between mankind and extinction by lack of food has been the activity of the chloroplast of the green leaf. Perhaps, before equal time has again rolled over the world, the synthetic production of food may have been achieved, and man in all his intellectual glory may claim equality with the lilies of the field. Until then the fixation of organic carbon by "photosynthesis" in green cells must, by us, be regarded as the basal chemical happening of our planet. Thousands of years of empiric agriculture have enabled man to exploit this aspect of vegetation with remarkable success, but the problem of carbon assimilation found its way into the laboratory only at the end of the eighteenth century by the genius of Priestley, and its broad aspects were first formulated by the wisdom of De Saussure in 1812.

We may consider in this article what progress has been made with this matter, as a problem of pure and applied science, in the century that has elapsed since then. The recent appearance of a summary review of our knowledge of the subject by I. Jørgensen and W. Stiles¹ gives a good foundation for such consideration.

Investigators have not been idle. The bibliography contains 250 entries, but these are not a tenth of the papers published, for our authors' intention is to ignore historical development and give only a critical account of those researches which mark the present advance line of knowledge on the many separate, but converging, roads by which this well-defended secret of Nature has been attacked. The authors are as severely critical as the commissioners on a military campaign. They have carefully thought over the aspects of the subject

¹ "Carbon Assimilation: A Review of Recent Work on the Pigments of the Green Leaf and the Processes connected with Them." By Ingvar Jørgensen and Walter Stiles. *New Phytologist* Reprint, No. 10. Pp. 186. (London: Wesley and Son, 1917.) Price 4s.