We shall therefore conclude with a remark on Dr. Maudsley's attempt to make something of the will—that apparent point of contact of the physical and the mental, which has been the veritable will-o'-the-wisp of our psychologists. Towards the end of his book (p. 442) Dr. Maudsley, in examining a “simplest case of volition,” tells us that it “sprang from that fundamental property of organic element by which what is agreeable is sought, what is painful is shunned.” This is not advancing knowledge, but rather the reverse. How can any substance, whether we call it organic element or by any other name, seek the agreeable and shun the painful? By movements; we know of no other way of seeking and shunning. But how are these mental things, pain and pleasure, related to movements of any kind? Here we find ourselves, after much laborious groping, face to face with the very problem we set out to solve. Truly what we have to learn in psychology, before and above all things, is our ignorance.

DOUGLAS A. SPALDING

OUR BOOK SHELF

Annual Record of Science and Industry for 1875. Edited by Spencer F. Baird, with the assistance of eminent men of science. (London: Trübner and Co., 1876.)

FOR this admirable record we have again to thank our American friends. The volume now extends to some 900 pages, and each year brings improvement as well as enlargement of its contents. Unfortunately so many subjects are now embraced within the scope of this annual record, that the space devoted to each subject is necessarily curtailed. This, we think, is a misfortune. If feasible, we would venture to suggest a division of the record into two parts, inasmuch as pure, applied and very homely science are here in close and curious juxtaposition. Thus we find “tables of elliptic integrals,” the “computation of the areas of irregular figures,” or the “dissipation of energy,” followed by “beautiful ornament for rooms,” “renewing wrinkled silk,” and “improved modes of closing barrel hoops.” It is true the editor has most carefully and laboriously classified the whole, so that we are gradually let down from elliptic integrals at the beginning to barrel hoops at the end. Doubtless the editor considered that by these things men would learn “beer and skittles” was an integral part of the scientific as well as the popular need. The first half of the work, which gives a general summary of scientific and industrial progress for the past year, is more carefully edited than the brief notices of papers which form the second half. For example, turning to general physics, we find paragraphs on Mr. Crookes' experiments scattered about in several places; the same is true of Dr. Guthrie's researches on cryohydrates and of several others we might name. Again, in the index, which is extremely minute, the same name is put under different headings; thus, Mr. Mr. Frederick, and Prof. Guthrie are the same person, though separately referred to. But in spite of these criticisms, the book is a useful one and contains a vast mass of information. Sketchy as it is, nevertheless it is undoubtedly the best annual record of science—in fact the only one in the English language; and hence we are glad to observe that a suggestion we made in noticing the preceding volume, namely, having a London as well as a New York publisher, has now been carried out. The scientific bibliography of the year and the references to periodicals, giving the fullest reviews of the books themselves, is an excellent and valuable feature of this Record.

Causeries Scientifiques. J. Rothschild, Editeur. (Paris.)

THIS little book gives a brief and popular account of some of the principal discoveries and inventions of the

past year. It is written in a lively, simple style, and doubtless has done something in France to extend an interest in science and to spread a knowledge, though but a superficial one, of the more striking results of experimental research. The absence of technical terms brings the volume before us within the comprehension of those who have had no scientific education. How is it we are so behind our neighbours in books of this kind? It would, however, have been well if the editor of this volume had paid a little more attention to the spelling of English names, and exercised closer supervision throughout, as we notice several misprints in its pages.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

The Self-fertilisation of Plants

SOME years ago my suspicions were strongly aroused by certain observations, against the importance of intercrossing; and since then other conclusions, such as the following, have been steadily forcing themselves upon me, and which will probably agree with Mr. T. Meehan's: (1) that self-fertilisation was the primordial condition of plants; (2) that conspicuous flowers of all kinds are a secondary result, due to insect agency, by increasing the size &c., of the perianth; (3) that this has, in its turn, caused a correlative disturbance in the sexual arrangements, viz., that it has caused to be sacrificed the (originally) normal state of self-fertilisation, and has set up cross-fertilisation instead; (4) that this latter being relatively less certain of being effected, is compensated for by a superabundance of pollen, alteration in its form and influence, dimorphism, the separation of sexes, and perhaps other details of sexual differentiation; (5) that the existing self-fertilising flowers are in no case primordial but degraded forms; (6) that in consequence of such degradation, of the perianth especially, the sexual organs have recovered their original energies, and so resume their long lost self-fertilising powers.

The rationale of the whole process I take to be “compensation.” In the first instance, the enlargement of the corolla is accompanied either by a more or less degree of destruction of one or both of the sexual organs; as in the ray-florets of *Centaurea*, which are neuter; in “double” flowered compositæ, where the new “ligulate” ones pass from the usually hermaphrodite condition of the tubular disk florets, or male, as in *Calendula*, to female only, or even to the neuter state, as in *Dahlia*; or else by the above-mentioned differentiations of the sexual organs in their forms and functions. The primary cause of such increase in the perianth may, perhaps, be due to the mere mechanical influence of the insects themselves, which by constantly renewed pressure, may determine a flow of nutriment to those parts; this—which I only assume as probable—diverts it temporarily from one or both whorls of essential organs. The result is protandry or protogyny, &c. To compensate again for the loss of self-fertilisation, there come into play, as stated above, all the adaptations to secure inter-crossing. Hence the idea of plants abhorring inter-breeding appears to have arisen from observing conspicuous flowers only, and as these are in the majority nowadays, it was a reasonable conclusion; but the self-fertilising ones are extremely numerous altogether; and it is this small but highly significant minority, not to add the special contrivances which occur in order to secure self-fertilisation, which leads one to the opposite conclusion.

Self-fertilisation I believe not to be always an absolute but a purely relative condition; that although many species are now altogether self-fertilising, yet whenever conspicuous flowers become dwarfed, I suspect there is a tendency to their becoming self-fertilising. I have found it to be so in some cases, and should feel extremely glad if any readers of NATURE would kindly observe, at this season of the year especially, whether any dwarfed wild or other flowers they can find are self-fertilising or not, or else be good enough to forward the same to me. For example, I have, this September, found dwarfed blossoms of *Linaria vulgaris* often spurless and without honey, having the stigma situated between the two pairs of anthers, and the pollen-tubes pouring into it both from above and below. Similarly in small flowered