

which were subsequently found to be the intermediary for the transmission of the remittent fevers, caused by the presence of spirochaetes in the blood, of man in Africa, and of domestic fowls in various countries.

For those who are not experts on ticks, but are made practically acquainted with them from the pathological point of view, a comprehensive monograph or handbook of the group has become an urgent requirement, and this need will now be supplied by the monograph of the Ixodoidea which is being produced by Messrs. Nuttall, Warburton, Cooper, and Robinson. Part i., dealing with the Argasidæ, has appeared, and consists of 104 pages (not including the bibliography of 18 pages), with three plates and 114 text-figures. This monograph will undoubtedly be a most useful publication, and it is to be hoped that this example will be imitated with respect to other groups of blood-sucking invertebrates. A modern comprehensive monograph of leeches, for instance, is also a work urgently needed by those who desire to study the transmission of the blood-parasites of fishes and lower vertebrates.

Who's Who, 1909. Pp. xxiv+2112. (London: A. and C. Black.) Price 10s. net.

Who's Who Year-Book for 1909. Pp. vi+154. (London: A. and C. Black.) Price 1s. net.

The Englishwoman's Year-Book and Directory, 1909. Edited by G. E. Mitton. Pp. xxvi+372. (London: A. and C. Black.) Price 2s. 6d. net.

The Writers' and Artists' Year-Book, 1909. Pp. vii+121. (London: A. and C. Black.) Price 1s. net.

THESE four works of reference are so well known and widely esteemed that it is hardly necessary to say more than that each maintains its high level of excellence. "Who's Who" continues to increase in bulk; this year there are 72 pp. of additional matter, indicating the editor's desire to make his roll of honour as comprehensive as possible.

The "Who's Who Year-Book" is made up of the tables which were formerly published in "Who's Who," with many new lists, including, we notice, one of the Nobel prizes awarded since 1901.

Every particular of importance about the useful work women are doing is to be found in the "Englishwoman's Year-Book and Directory"; and as the Editor remarks, "no woman who takes any part in public or social life can afford to be without it." Even a glance through the volume will serve to show that women are making notable contributions to knowledge, and taking an honourable part in every form of activity intended to improve the conditions of human life.

The title of the fourth year-book sufficiently describes its scope; the volume should prove of great assistance to young writers and artists.

Arcana of Nature. By Hudson Tuttle. With an Introduction by Dr. Emmet Densmore. Pp. 471. (London: Swan Sonnenschein and Co., 1908.) Price 6s. net.

DR. DENSMORE'S introduction includes memoirs of Emanuel Swedenborg, A. J. Jackson, Hudson Tuttle, Cora Richmond, and W. J. Colville; and this fact—since all are described here as "psychics"—will serve to indicate the scope and character of the volume. "The Arcana of Nature" was published in 1860, and its subtitle, "The History and Laws of Creation," shows its ambitious aim. Dr. Densmore has been impressed with the phenomena to which attention is directed in this volume, and he feels they deserve consideration "from the psychic student as well as from the general public."

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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 intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Flying Machines and their Stability.

IN the early part of this year I suggested in a letter to NATURE (vol. lxxvii., p. 293, January 30) that it would be desirable for experimenters with flying machines to direct their attention to automatic stabilising appliances, and the character of the accidents which have occurred since that letter was written tends to emphasise the importance of this.

Among the six degrees of freedom possessed by any body free to move in three dimensions, viz. \dot{x} , \dot{y} , \dot{z} , $\dot{\theta}$, $\dot{\phi}$, $\dot{\psi}$ (x being horizontal in the direction of motion, y and z horizontal and vertical, and $\dot{\theta}$, $\dot{\phi}$, $\dot{\psi}$ angular velocities about x , y , and z), \dot{x} , \dot{y} , and \dot{z} may be controlled by hand, but for steady motion it is requisite that $\dot{\phi}$ and $\dot{\psi}$ should be zero except when the course is changing, and $\dot{\theta}$ should be zero except when the horizontal curvature of the course is changing.

Of these angular velocities, any of which may be caused by instability, $\dot{\theta}$ is the most dangerous, and it is to the automatic extinction of this that attention should be directed in the first place. (This is the form of instability which most kites suffer from in strong winds.) $\dot{\phi}$ may be a source of danger if the pitching or diving is considerable, but $\dot{\psi}$, which corresponds to a wandering course in the horizontal plane, may be dealt with by steering.

There can be little doubt, I think, that for aëroplanes the best method of correcting for $\dot{\theta}$ is that adopted by the Wrights, namely, the alteration of the relative inclination of the wing surface on either side. In this they are following the practice of the long-winged birds, but the control should be automatic.

Automatic control of the wing surfaces could be effected by any device which would copy with power the position of a short pendulum without exerting any force on the pendulum itself.

The pendulum must be short, because $\dot{\theta}$ must be related, not to the absolute vertical, but to the direction of the resultant of gravity and the centrifugal force due to the horizontal curvature of the course (whatever that may be), and a pendulum with a short period and considerable extinction sets itself very quickly in this direction.

It may be remarked that the same class of device could be used for the automatic control of $\dot{\phi}$. The problem here presented offers a large field for invention.

Too much stress is often laid on the particular forms given to the wing surfaces. In reality, flight is possible with almost any form of wing if appropriate surface speeds are used.

In nature flight is conducted in two ways, of which, among birds, the albatross and humming-bird may be cited as extreme examples. With the first of these the body speed must be high, and much power has to be exerted in starting before the economical speed is reached. With the latter the body may be stationary, but the wing speed is always high.

This type of flight corresponds to "lifting screws" on a flying machine, and with this form, I believe, no success has hitherto been achieved. It seems not impossible, however, that with proper balancing appliances it will ultimately prevail, considering what great advantages it offers in the matter of starting and stopping. In the matter of economy of power, also, it is obviously better to use, if possible, the same surface both for support and propulsion rather than separate propellers as aëroplanes must do. If the aëroplanes could propel themselves by flapping their wings, the latter objection would not apply.

A. MALLOCK.

6 Cresswell Gardens, S.W., December 16.