lication," on May 7 last. The discussion was opened by Sir Robert Hadfield, President of the Society and a member of the Subcommittee appointed by the Conjoint Board of Scientific Societies to deal with the "Overlapping between Scientific Societies." Among others who spoke were Professor Schuster, Dr. R. Mond, Mr. Longridge (president of the Institute of Mechanical Engineers) and Mr. Wordingham (president of the Institute of Electrical Engineers). Sir Robert Hadfield's chief suggestion was that there should be a Central Board (such as the Conjoint Board) appointed to receive all scientific papers and to allot them for reading and discussion to the society to which they would be of most interest. In addition the board should circularize other societies likely to be interested in order that their members might be aware of what had been done and enabled to attend and take part in the discussion if they so desired. This plan would, of course, involve some degree of federation between all the larger societies; a federation which was evidently regarded very favorably by those present at the meeting. It has indeed already taken place in Germany, where a Union of Technical and Scientific Societies, with a roll of some 60,000 members, has been formed more especially to cope to the best advantage with the problems which must arise at the end of the war. In New York also the United Engineering Societies have a central building and library, provided by the generosity of Andrew Carnegie, where the several societies meet for discussions, and where they are brought into closer contact than is possible with the decentralization which obtains here. Nor should the federation be limited to the United Kingdom alone. The great societies should have Colonial representatives, particularly those dealing with problems of an industrial character. In pre-war days the Iron and Steel Institute had a representative of the German Empire, which was thus kept in touch with English research, but no representative from our own Dominions. With a federation of this kind it might be possible to maintain a common building (*e. g.*, an enlarged Burlington House) for meetings and to house a joint library which should contain, in particular, all the publications referred to in the International Catalogue. Several speakers dilated on this idea, Dr. Mond suggesting that it should have a staff of translators competent to provide complete translations of papers written in the more difficult languages (*e. g.*, Russian or Japanese) when they were required; while Mr. Longridge went further in desiring a College of Librarians; men able to discuss research with inquirers and not merely to put them on the track of past work, but also to inform them of the work then in actual progress! Less utopian was the demand for uniformity in publication. It is most desirable that all Proceedings, Transactions, etc., should be printed on the same sized paper and in the same type so that collected papers on any one subject may be bound together. The scheme for the pooling of papers was opposed by the institutions on the ground that they awarded prizes for the best papers submitted to them and that, under the scheme, this incentive to research might disappear. Obviously, however, this difficulty might easily be overcome if each society retained the right to print any papers sent to them irrespective of their ultimate fate at the hands of the board. A more serious objection is that a paper is usually written for a particular class of reader. A treatment suitable for the Physical Society would probably not be best for the Iron and Steel Institute. Having regard to this fact it seems probable that a central board would find its most important function in issuing a weekly or monthly list of forthcoming papers with intelligible abstracts, as suggested by Professor Schuster.—*Science Progress.*

SCIENTIFIC BOOKS

Dynamic Psychology. By Robert Sessions Woodworth. New York, Columbia University Press. 1918. Pp. 210.

A critic in the *Nation* once remarked, "When a statement is obviously false we call it stimulating; when it has no meaning what-

ever we call it suggestive." The present reviewer has long cherished this saying as profoundly apposite, but occasionally one encounters a thinker who can be both sane and stimulating, at once clear and suggestive. That Professor Woodworth is such a thinker is perhaps more apparent than ever before in this little volume containing his Jesup lectures. Withal it has great charm of style.

Professor Woodworth's conception of dynamic psychology is that, maintaining friendly relations with both behaviorism and the introspective school, it treats experience from the causal rather than the merely descriptive point of view. Its problem is twofold, that of *drive* and that of *mechanism*; of the impelling forces behind various forms of experience and of the method by which these forces operate. From this general point of view the several lectures, after an introductory discussion of "The Modern Movement in Psychology," deal with the topics of "Native Equipment," "Acquired Equipment," "Selection and Control," "Originality" and with abnormal and social behavior.

The characteristic feature of the author's conception of mental dynamics is that the various nervous mechanisms for the performance of mental function are not apparatus waiting to be filled with energy from a few great drives or instincts; that, on the contrary, every mechanism has a drive of its own. The mere fact of its existence as an adequate mechanism means that there is a special tendency to use it. He takes issue with McDougall on this point. Special interests and aptitudes, for instance, are not, Woodworth thinks, based on nervous mechanisms that are driven solely by great general impelling forces called interest, pugnacity, and the like; the motive forces are inherent in the mechanisms themselves and are impelling interests for their own special objects.

A drive, according to him, involves the advance excitation of the final or consummatory reaction of a series: this incipient reaction sets into operation all the associated movements which tend to bring it fully about. A mechanism which thus possesses its own drive must be an innately good mechanism; thus the "interest" which impels the student of music is due to the fact that his musical mechanisms, by innate endowment, work well.

The author is thus led logically to take issue with Freud. The various creative activities which the latter refers to the redirected energy of the sex instinct as their sole driving force, have in Professor Woodworth's opinion driving forces of their own. Of "sublimation" he writes that when an intellectual interest, say, is made to supplant the sex impulse, the latter "is not drawn into service, but is resisted." It is true that a drive may enlist other mechanisms into its service, but these are "mechanisms that subserve the main tendency, whereas 'sublimation' would mean that the tendency towards a certain consummation would be made to drive mechanisms irrelevant or even contrary to itself. There seems to be really no evidence for this, and it probably is to be regarded as a distinctly wrong reading of the facts of motivation." Professor Woodworth's idea that only inherently good mechanisms possess drives of their own is also in curious contrast to the perverse view of Adler, whom he does not mention; the view, namely, that special interests are due to inferiority of the organic mechanisms involved.

It is a refreshing doctrine that makes our intellectual interests thus self-supporting and independent of the great impelling forces which we share with the lower animals. Whether it can be carried as far as the author carries it without departing from probability the reviewer is inclined to doubt. The advantage of the opposed conception, which appeals solely to the primitive drives, is that we can see a biological justification for activities thus motivated. We can understand why organisms that failed to be driven by sex, pugnacity, gregariousness, must have been eliminated in the struggle for existence; it is not easy to see why an individual who failed to exercise for its own sake a nervous mechanism for music or mathematics should have been biologically unfit. Again, as Professor Woodworth points out, although a nervous

mechanism that works well supplies its own drive, it must not work too well; there must be some stimulus of difficulty. But may it not be argued that when a person loses interest in his work because his task is too easy, his mechanism too good, the reason must be either that the consummatory reaction is not connected with one of the great biological drives, or that he is not the kind of person to whom unsolved problems, that is, mechanisms some of whose parts are still undetermined, are *ipso facto* very strong drives; one who turns always from the familiar to the new task? If he is of this type we may as well say that he is urged by the drive of curiosity, whose biological value is clear. In other words, while special talents, specially good mechanisms, may involve special readiness of their consummatory reactions to be excited, without certain general traits of the personality like energy, curiosity, pugnacity, mere excellence of a mechanism would not suffice for its prolonged and effective use. The reviewer has elsewhere pointed out the possible function of the activity attitude in connection with those intellectual tasks which are only indirectly related to the primitive drives.

Of the many other points for discussion that are suggested by these lectures, there is space to mention but one. Those of us who hold, with the author, that introspection has furnished some scientific results "with such regularity that they command general assent, and probably even the extreme behaviorists in their hearts believe them," will be interested to observe how much of the evidence for Professor Woodworth's contentions is of an introspective character. In his arguments on the nature of human motivation the appeal is constantly to introspection.

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A Laboratory Outline of Neurology. By C. Judson Herrick and Elizabeth C. Crosby. Philadelphia and London, W. B. Saunders Company. 8 vo. 120 pp.

After many years of teaching experience on the part of the senior author, C. J. Herrick and E. C. Crosby have produced an excellent laboratory outline of neurology. The outline includes directions for the dissection of the brains of elasmobranchs and of mammals. The directions for the elasmobranchs are especially acceptable for they are accompanied by some much needed and novel diagrams from the unpublished work of Norris and Hughes. In addition to a very clear and well-arranged account of the subject matter, the volume contains abundant references to the literature. The text is arranged so that it may serve for a variety of courses, seven of which are outlined in the introductory chapter. The volume is compact and well printed both as to text and illustrations.

G. H. P.

SPECIAL ARTICLES

HYGROMETRY IN TERMS OF THE WEIGHT OF A FILM OF GELATINE

I have recently had occassion to reconstruct a form of horizontal torsion balance which I used in 1890 in measuring the absolute viscosity of steel.[1] Even when quite robust, it can easily be made so sensitive that an excursion of over 10 cm. is equivalent to a milligram. It should therefore be available for indicating the absorption of atmospheric vapors on the part of light bodies.

Fig. 1 shows the apparatus, the suitably braced frame being made of strips of tin plate, bent C-shaped in cross section to secure rigidity. The torsion fiber, *ab*, of brass wire, .2 mm. in diameter 35 cm. long, is stretched between vertical screws (around which the end are wound), each provided with a lock nut so that a fixed tension may be imparted to the wire. The pointer, *cd*, also about 35 cm. long and of light varnished wood, is carried at the middle of the tense wire (threaded through a fine hole in the stem and looped around it), with an adjustable screw counterpoise at *e* in the rear. The index at, *d*, plays over a light circular scale of brass, *fh*, which in my apparatus comprehended about 130°, though it

[1] *Phil. Mag.*, XXIX., p. 344, 1890. The change of the electrical resistance of gelatine in relation to hygrometry has been studied by Dr. G. B. Obear.