themselves to a process which might be leading them any whither.

This volume contains an excellent historical sketch of the various systems of symbolic logic and as such is a most valuable book of reference. To read it with profit, however, some knowledge of the several systems is necessary. It would have been a manifest advantage had the author given, for instance in his chapter on The Process of Solution, a more detailed and elementary account of the original method of Boole, or of the method of Venn, being as it is a developed form of the Boole method. Thereby the difficulties for the lay reader would have been overcome to a great extent. JOHN GRIER HIBBEN.

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Thought and Things, or Genetic Logic. Vol. I. *Functional Logic.* JAMES MARK BALDWIN. London, Swan, Sonnenschein & Co.; New York, The Macmillan Co., 1906. Pp. xiv + 273.

This is the first of three volumes, appearing in both French and English, on a subject never before given comprehensive systematic treatment. It brings into use a somewhat unusual terminology. The terms pragmatelic, semble, sembling, autotelic, heterotelic, syntelic, psychonomic, autonomic, heteronomic, syndoxic, progression, mode, schema are used with restricted although clearly defined meanings, and we might add to the list. Some readers will wish for more elucidation and continuity in places and there are some passages whose meanings are rather elusive. But the methodological difficulties of the subject are unusually great and have been handled with a remarkable degree of success. The author's evident interest in the subject itself, rather than in the style of the discussion, is neither surprising nor reprehensible.

The author realizes that the title, Genetic Logic, is likely to provoke criticism (pp. vii, 18). We should say the place of genetic logic among the philosophical disciplines is not unlike that of sociology among the social sciences. Sociology is neither history, economics, psychology nor anthropology and some whose contributions to these subjects give them a right to speak say there is no separate science of sociology. Genetic logic is neither straight logic, straight psychology, nor straight epistemology. Logic is not genetic, psychology is not interested in questions of logical validity, and epistemology, although broader and more elastic than the other two, does not involve as much psychology as this book presents. And yet the author is correct in assuming that the problems here discussed are real and pressing. They are not new. The time seems to have come for a systematic presentation of all this material and it is to be hoped that this is only the first of several works on the subject. It is a colossal task for which the philosophical *Zeitgeist* has been long in training, and one can only praise the keenness and comprehensiveness of this treatment.

The author confines himself to the same rules of observation and hypothesis as those observed in 'the empirical sciences generally' (p. 9), asking the questions—How? and Why? —as well as the question—What?—with reference to each form and mode of knowledge. Neither the formal logician's logic, nor the metaphysician's 'logicism,' will concern us here, but rather the knower's logic, cognitive processes viewed from the knower's standpoint. We are to study the genesis of knowledge and thought, and construct a genetic theory of reality. The former topic is discussed in the first two volumes, the latter, in volume third. The first volume presents a genetic theory of what the author calls the pre-logical cognitive functions, the second, a genetic theory of thought and judgment, and the third, a genetic theory of real logic or the 'hyper-logical functions' (p. 15). 'Genetic psychology of cognition' and 'genetic epistemology' (p. 18) are other names for the two main topics of the work. It seems to us that 'genetic epistemology' would be a good title for the entire work.

The author asks (1) 'what are the conditions determining the construction of objects at any given stage of mental development, and (2) what are the psychic characters of the objects thus determined' (p. 30). He distinguishes "in the actual results to which the research has led, the following phases of con-

sciousness traced in each case along with the objects through a series of modes: (1) The controlling conditions of the determination (that is, the control of the object); (2) the motive to each of the determinations (the problem of interest as 'practical,' or 'theoretical,' or other); (3) the function involved in each determination; (4) the meaning of the object over and above its actual objective marks' (p. 30 f.). On page 34 seven sorts of objects are distinguished and defined as follows. (1) The projective object of sense, (2) the image object (of memory and fancy), (3) the make-believe object ('the first determination of the semblant object'), (4) the substantive object (either mind or body), (5) object of experience (object to a subject), (6) judged or logical object (an object of experience which the psychic subject as such is aware that it is in some sense acknowledging or controlling), (7) the esthetic object (of higher semblance in which the dualism of inner and outer controls is annulled in a state of immediate contemplation). Corresponding to these are seven modes, namely, sense, image, play, substantive, subject, logical, æsthetic (p. 32).

A criticism suggests itself here. This is a work on the knower's logic, but the first four 'objects' in this list are not objects to the knower. They are objects only to the psychological observer who analyzes. They are (to use words which the author uses to characterize a different subject) 'abstract meanings of our reflection, that is meanings only to a consciousness that can have an object that means this.' This suggests another fundamental objection, namely, to the author's treatment of mere presence in consciousness as knowledge, 'projective cognition.' This treatment leads to setting up a 'subject,' or a 'consciousness,' or etc., as the other term of the cognitive relation, and gives us an epistemological dualism for which there is no solution.

This epistemological dualism runs through the entire book and is especially evident in Chapter III., on How Knowledge is Made. Here a system of 'grasping' and 'habitual dispositional processes' is set over against an extra-psychic stimulus which, in some cases, 'is not content with knocking down our fortifications,' but 'rides full-armed through our walls, and compels its recognition in certain of its characters *for what it is*' (p. 50, foot-note). This 'outside world' whose impacts (p. 54) are represented in consciousness by the 'sense residuum or datum' is as much a thing-in-itself as Locke's outside world or the explanation of our modifications of sensibility in Kant's epistemology. If the author means that this dualism of controls is merely psychological, the uncritical dualism of naïve consciousness and one which he does not regard as real or valid, we should say it is a needlessly artificial way of describing the content of consciousness, and also that it is misleading to cite and criticize in this connection an epistemological doctrine of control such as that of Dewey.

In Chapters VII., VIII. and IX., on Meaning, the limiting and negative sense datum is defined as a 'meaning,' and on page 172, 'meanings arise as variations which presented complexes take on for the satisfaction of varying dispositions.' But how is this to be reconciled with the doctrine of a 'foreign' sense-datum, and with the general doctrine of 'outer control'? At the conclusion of the book the author claims to have found that there is no sort of discontinuity or dualism between prelogical function and thought, and that the positive dualism is one within the operation of the developing function of cognition, the dualism of meanings (p. 272). A consummation devoutly to be wished at the present, but what shall be said of the foreign warrior who 'rides full-armed through our walls'?

In a foot-note on page 50 the author seems to ascribe to Dewey an epistemological dualism of which we understand the latter to be the sworn enemy. We may be in error as to the teachings of both men, but so far as they discuss the same aspects of the subject at all we find many points of similarity between the author's doctrine of control (and also his outlined experimental logic) and the teachings of Dewey. The latter holds that *to the knower* control always means objectivity, while Bald-

win teaches a dualism of subjective and outer controls; but in other respects they are not so far apart.

Play, sembling and experimentation are central in this theory of knowledge. In play we semble, that is, we treat an object which we have invented, one 'freely' determined by 'subjective control,' as though it possessed certain coefficients of reality which it lacks. By experimentation we test these play constructions and find that they are either mere fancies (belonging to the inner world of subjective control) or else sense objects (possessing universality and belonging to the outer world of foreign control). Thus play and experimentation, leading to judgment, mediate between the 'inner' and the 'outer,' between 'subjective control' and 'outer control.' The author does not refer to language, or to sympathy, imitation, jealousy, bashfulness, gregariousness and other instinctive or impulsive reactions which involve social situations. Why should play be singled out as the only impulsive reaction contributing to the development of judgment? Universality is not involved in mere play because (1) few can enter into a game and (2) both the objects and the self of play are tentative and fictitious. Mere semblance is not characteristic of objects of knowledge as such. In short, we find a gap between play and experimentation, between sembling and judging, which the book has not filled, the gap between perception and conception, between sense and reason, between mere sentience and reflection. The author's theory seems to lead to the doctrine that facts are all 'outer'—that they are ultimately trans-objective—while meanings and values are all subjective (see pp. 135 f.), and judgment must perform the miracle of joining them. Beyond this difficulty, the author's dualism of subjective and outer controls would make genuine experimentation and judging impossible. These brief critical suggestions, of course, need elaboration, but the reviewer's respect for the writer's results as well as his sense of the importance of this discussion incline him to let them stand.

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THE WAYS OF SHEEP.

The Flock. By MARY AUSTIN. Pp. 266, illustrated. Houghton, Mifflin and Company. 1906.

Scientific observation as conducted by scientific men is rigorous, repeated and checked by the ingenious employment of experimental control of conditions. Observation by the nature lover may not be so guarded and tested. And every publication by word of mouth or impress of type of obviously mistaken record of seeing or of misinterpretation of the really seen that comes from the nature lover confirms the rigorous-minded scientific man in the belief that only his sort of observation reveals the truth. Hence we do not search literary books for contributions to science: which is a habit of omission that may lose to us some valuable data.

Mary Austin, an author known especially to readers of the *Atlantic Monthly* and to those generally who seek to acquaint themselves with the better sort of American writing, has included in 'The Flock' a host of singularly interesting and suggestive observations on the ways of sheep. The author has lived near (in more ways than one) sheep and sheep dogs and sheep men for seventeen years, and is a keen and careful observer and an honest and gifted recorder of her observations. Hence 'The Flock' is a book which the driven scientific man may read for recreation and information at once. How unusual!

I shall take space to refer to but two or three of Mrs. Austin's observations or summations of observation. The 'mob mind' of sheep is a very real thing in determining the ways of the flock. In the flock

there are always leaders, middlers and tailers, each insisting on its own place in the order of going. Should the flock be rounded up suddenly in alarm it mills within itself until these have come to their own places.

Suppose the sheep to scatter widely on a heather-planted headland, the leader feeding far to windward. Comes a cougar sneaking up the trail between the rooted boulders toward the meanest of the flock. The smell of him, the play of light on his sleek flanks startles the unslumbering fear in the meanest; it runs widening in the