

to let their money be spent on space-travel. He is familiar with all the literature on the subject, and he gives a useful list of references at the end of each chapter. He steers a wary course halfway between a popular exposition and a text-book. Though he is careful to avoid mathematical symbols, he does not shirk detail: there is plenty of numerical grist, indeed perhaps rather too much, since all weights and distances are expressed in both English and metric units. This practice has something to be said for it, however, in a subject like space-travel, where the applied scientist, a slave to slugs, has to co-operate with his purer, gram-bound colleague.

In the choice of subject-matter there is little need for improvement, but it is a pity that the same cannot be said for the style of writing. Mr. Burgess can find the happy phrase when he tries, but at times he is content to be slipshod and repetitive, and occasionally it is none too clear what he means. Apart from this intermittent failure to communicate, Mr. Burgess is usually a reliable guide to the untrodden paths of space. But he is not infallible, and it has to be said that the book is marred by too many minor mistakes: on p. 97 and elsewhere he repeats the crucial error which misled the interplanetary theorists for so long, namely, their belief that the weight of structure and motor on any missile (or stage of a missile) could not be much less than 20 per cent of the total, though even in 1952 the *Viking* achieved 15 per cent; p. 63 needs thorough revision; Fig. 1.2 is in error; and there are more than thirty other trivial errors or misprints. D. G. KING-HELE

LOGICAL STUDIES AND INDUCTION

Logical Studies

By Prof. Georg Henrik von Wright. (International Library of Psychology, Philosophy, and Scientific Method.) Pp. ix+195. (London: Routledge and Kegan Paul, Ltd., 1957.) 28s. net.

The Logical Problem of Induction

By Prof. Georg Henrik von Wright. Second revised edition. Pp. xii+249. (Oxford: Basil Blackwell, 1957.) 25s. net.

A REVIEW of these two volumes together may serve to show the range and depth of Prof. G. H. von Wright's thinking. His "Logical Studies" comprises a series of eight papers—five of them published previously—and the "Logical Problem of Induction" is essentially his *doktor-arbeit* submitted to the University of Helsinki in 1941. The present book is a second, enlarged edition of the original work published as Vol. 3 of *Acta Philosophica Fennica*.

With regard to the "Studies", three essays are presented dealing with the problem of logical truth. This amounts to an attempt to clarify the statement that logical truth is at root a tautology; or otherwise expressed, that logical truth is a function of form but not of content. It is valuable to have this theme so competently handled. A general lack of understanding about it may well be one reason (no doubt there are others) why scientists are apt to complain that philosophers do little beyond echoing and complicating the less secure tenets of physical theory. Until some crucial issue focuses attention upon it, experimentalists in particular are naturally reluctant to take seriously a discipline which makes rigid demands upon

the structure of ratiocination but has nothing to say concerning that which is in fact the subject, the thing-in-itself as Husserl would insist, and its associated correlates.

Underlying this dilemma is the failure to allow enough for the æsthetic content of each problem, whether scientific or logical. Mere applications or developments of existing knowledge are unlikely to prove coercive, since they rarely provide an opportunity for that contemplative factor which lifts the best human efforts above the useful and the pragmatic. It is for this reason that those about to embark upon any postgraduate course of study or research would find it rewarding to read the first chapter in this collection, namely, "Form and Content in Logic".

The next group of contributions is concerned with modality: it should have a wide appeal because of the relationship to probability and the study of norms. But perhaps the most interesting point here is the recognition that there can be—and actually is—a new modal logic which is relative rather than absolute, in the classical sense. The author maintains the Aristotelian origin of this distinction, namely, $\delta\pi\theta\acute{\epsilon}\sigma\epsilon\omega\varsigma$ against $\acute{\alpha}\pi\lambda\omega\varsigma$. Lexicographically, the emphasis of the former is upon 'that which is under', whereas the latter stresses simplicity or singleness. It would have been helpful if Prof. von Wright had enlarged upon this theme a little, because it would have strengthened his assertion that the relative should include the absolute as a limiting case. The concluding study (the concept of 'entailment') bears an epistemic slant, and gives a broad hint of how close we are to the notion of demonstrability.

Turning now to the "Logical Problem of Induction", this largely follows traditional lines in discussing any respectable justification for that which we all take for granted, and upon which so much of everyday life is based. The upshot is that, broadly speaking, induction cannot be rigorously defended, although this result does not necessarily involve such disastrous consequences as are sometimes feared. Prof. von Wright's treatment of this situation is as follows. The basic thesis is presented in the form, "It is impossible to guarantee, with certainty or with probability, that an unknown instance of the property A will also exhibit the property B , if A and B are different properties". (We may perhaps compare this with other 'postulates of impotence' such as that relating to electrostatics or with the second law of thermodynamics, or even with the negative existential quantifier $\sim\exists$, "there does not exist...") It appears that, on contrasting a single statement with truth-frequency for a class of statements, it is reasonable to delete "with certainty or with probability". But criteria of the truth of inductive instances cannot be demanded, though this does not preclude the acceptance of 'symptoms' as applied to experience. Embedded in the whole domain of human thought is the temptation to confuse issues of language and of fact. The classification of the former as a lemma to the solution of Hume's problem is the critical task of philosophy, in contrast to the constructive task with its focus upon given conceptual structures. The analysis of inductive propositions can then be undertaken on mathematical principles. Constructive philosophy is not the tool to use for dealing with Hume's scepticism; it has sufficient material upon which to work in its own field, for which Prof. von Wright has provided a sound foothold, as well as a springboard for inductive studies.

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