

Book Reviews

A THEORY OF HUMAN KNOWLEDGE

Genetic Epistemology

By Jean Piaget. Translated by Eleanor Duckworth. (Woodbridge Lectures, Columbia University, 1968.) Pp. 84. (Columbia University Press: New York and London, April 1970.) \$5; 45s.

IN his autobiography Professor Piaget has related how, after his first book on children's reasoning had been published, Einstein asked him to undertake "a developmental study to determine whether the child's intuition of speed depended on a previous comprehension of time and space or whether the former came first"; he found (as he puts it) that "the child is a little relativist, not a Newtonian absolutist". The fruitful suggestion thus thrown out by Einstein turned his attention to what he now calls a "genetic theory of knowledge, i.e. the project of a scientific epistemology based on mental development, both ontogenetic and phylogenetic"; and the problems that emerged formed the starting point for numerous experimental studies carried out by himself and his co-workers at Geneva during the past forty years.

The detailed results have already been set forth in three volumes entitled *Introduction à l'Épistémologie Génétique* (1950); and the four Woodbridge Lectures, now issued in an English translation, present a brief summary of his chief conclusions, and report several new and ingenious experiments confirming his original contentions. The first lecture is chiefly critical. Present-day philosophers, he maintains, tend to treat scientific knowledge as "something final and static"; they either ignore the psychological basis of all human knowledge or improvise a psychology of their own regardless of the actual findings of psychological research. The remaining lectures deal with the formation of such concepts as substance, class, number, time and space. Generally speaking, their gradual development in the mind of the child runs parallel to their gradual evolution during the history of scientific thought. But there are notable exceptions; thus the average child of seven can recognize the topological properties of space, but he does not appreciate Euclidean or projective properties until three years later.

For this reason, so Piaget believes, a merely historical approach may be highly misleading. Why, it is often asked, is *Homo sapiens* distinguished from all other animals by the ability to reason? Because, so it is commonly said, he is endowed with the power of speech. The logical positivists, for example, hold that "all mathematical concepts are derived from logical concepts, and that logical concepts are essentially linguistic structures". Quite wrong, replies Piaget. Observations on both normal children and deaf-mutes reveal that "many logical concepts develop much earlier than, and independently of, language; the idea of number also develops, more or less independently, out of practical attempts to arrange things in visible order". This, as he points out, is in line with Chomsky's contention that "language is derived from reason, not reason from language". But he doubts

Chomsky's further assumption that "logical concepts and the ability to reason are innate": "they develop progressively during the first few years of life out of the preverbal coordination of actions; their processes are gradually internalized and so give rise to such conceptual structures as order, number, class and the like".

Piaget, however, explains that he is here concerned solely with the ontogenetic, not with the phylogenetic, development of human knowledge, and therefore refrains from going farther back into comparative biology; if he did so, he might (so it has been argued) find some justification for Chomsky's view. We may certainly agree with Piaget that, so far as individual development is concerned, human knowledge is dependent on, and limited by, the sensory and motor endowment of the human organism. But that endowment must in turn have been developed by natural selection during the evolution of the race.

A human being is a body of moderate size moving about with moderate speeds on dry land, where the objects with which he has chiefly to cope are likewise solid or semisolid bodies of a similarly moderate size, moving (if at all) with similar speeds. In such an environment survival is most effectively secured by a species endowed with vision as the chief distance-sense and kinaesthesia (the muscle-and-joint sense commonly confused with touch) as the sense that chiefly guides his movements. Man therefore tends to interpret the universe in terms of the motion of material bodies moving about in a visible space. Until quite recently this was the source of the basic concepts, not only of common sense, but also of physical science. The revolutionary changes in physics, quite apart from the philosopher's criticisms, have brought home to us how limited and inadequate these concepts really are. As Piaget himself expressed it in one of his earlier papers, "Man's hereditary nervous system and sense-organs are essentially the product of his primitive adaptive needs".

CYRIL BURT

LONDON'S COUNTRY

London's Green Belt

By David Thomas. Pp. 248. (Faber: London, March 1970.) 65s.

THE 846 heavily protected square miles of London's green belt are one of the most remarkable fruits of town and country planning in Britain during the past 25 years. The existence and purpose of the belt seem to be widely known and understood, and politicians believe that they dare not allow a brick to be laid upon its fair green face. A measure of their nervousness is the three years it took to get 400 acres of derelict glasshouses in the Lea Valley allocated to house building between 1963 and 1966. Only the protection of open countryside is pursued with comparable zeal by Britain's planners.

The effect of this care, as Dr David Thomas says in his well researched book, is that the spread of residential and commercial land uses grew by only 0.3 per cent between 1955 and 1960. At that rate, open land in the belt will drop from its present 88 per cent to 82 per cent during the next hundred years. For a stretch of real estate under pressure for development from one of the greatest cities in the world, that is extraordinary.

One gets a sight of what all this means by taking the Bakerloo underground line to Stanmore. There, as you step out of the train, is London *circa* 1938. Barely a thing has changed since. You can walk out of the station, cross a main road, go down a close of quasi-Bauhaus houses, climb over a farm gate and you are in fields. By any standards you are also in an ideal building site.

Dr Thomas describes how the green belt was first proposed at the turn of this century as a pleasure ground for