ordinary Christmas present: despite its university imprint, I have a suspicion that this is the public for which it was really intended.

CONOR FAHY

CYBERNETICS: MACHINES WITH INTELLIGENCE, by Neville Moray; Burns Oates (Faith and Fact); 9s. 6d.

This very interesting account of what the machine age is, how it has come to develop and what its limits are, is an ideal introduction to 'one of the most exciting intellectual disciplines of our time'—cybernetics. Dr Moray has considered in very general terms the relationship of living and non-living matter, human and animal life to the machine. He develops systematically the various concepts needed for understanding how the the self-reproducing, self-adaptive machine may come into existence. The concept of the artefact is first considered and then the meaning of feedback systems, system matrices and markov processes is introduced by examples of everyday experience. Various behavioural patterns of systems are then examined which lead to learning and evolutionary processes. The reader is easily able to follow this adventure as Dr Moray proceeds.

He concludes that it is quite possible for self-reproducing systems to come into existence merely by chance and that it is possible to build a type of machine which 'learns' from its past experiences, reproduces itself and shows evolutionary behaviour.

The reviewer, however, believes that Dr Moray might mislead the reader somewhat, as the most advanced self-learning, self-reproducing machine is still only a clever mechanism in relation to the human being and 'it would however be possible for a machine to emerge, which was substantially cleverer than its designer', while true in a certain sense (in the sense that the machine might be able to satisfy *some given criterion* in an ingenious way unthought of by its designer) implies that man may end up with a creature superior to himself; however, not so,—a machine can only do what it is told to do. The possibility does exist, however, that since the mechanism of the human mind is unknown, a machine might appear by chance with such properties and so apparently exhibit a mind of its own. But, this is speculation only and should not be confused with characteristics of the machine, which can be definitely established.

These important limitations on what an artefact can be designed to do (for instance, a machine cannot have self-awareness) are considered in detail by Dr Moray and he shows purely on cybernetic grounds that man is truly unique relative to the animal and machine about him. Throughout all of the development, the relation of Christian teaching regarding the soul, free-will, etc., is considered and it is concluded that contradiction in its teachings does not arise with the arrival of the 'intelligent' machine. The book is to be highly recommended.

EDWARD J. DAVISON