represented as (a) a mere acceptance of 'the Aristotelian doctrine that the soul is the form of the body', together with (b) arguments to show that the soul is, none the less, immortal. The reason *why*, for St Thomas, the rational soul is the substantial form of each man as a whole is not explained; it is just 'Aristotelian'. So too the richly subtle analysis of the process of human knowledge and the function of *intellectus agens*—called misleadingly, without further explanation, the '*active* intellect'—passes almost unnoticed. Van Steenberghen's judgment, 'la solution que saint Thomas apporte au problème de la nature de l'homme dépasse toutes les tentatives antérieures enregistrées par l'histoire', may (though it would be upheld by Gilson and Forest) err by excess; Fr Copleston errs, I fancy, in the other way.

A Dominican may be excused for being touchy where St Thomas is concerned; and it is St Thomas who comes off worst in this otherwise valuable and in parts, especially the latter parts, excellent little work. I wonder, in conclusion, whether a paragraph on Petrarch's irritable reaction against Scholasticism—technically inexpert though it was—might not have rounded off the picture. KENELM FOSTER, O.P.

MODERN COSMOLOGY AND THE CHRISTIAN IDEA OF GOD. By E. A. Milne. (Clarendon Press; 21s.)

These lectures, written shortly before Professor Milne's death, give a less technical account of his mathematical researches in cosmology. He was convinced that physics should aim at becoming a deductive science, no longer discovering its laws by induction from empirical observation. Instead of a direct appeal to experience, this merely serves as guide in laying down a set of axioms, which define the precise subject-matter under discussion. Theorems are derived as logical consequences of these axioms, and observation may then test the extent to which such theorems are realised in nature, its approximation to a Platonic ideal. This programme has so far been carried out only for geometry: Milne's work represents a remarkable attempt to give cosmology the same status by postulating additional axioms about the passage of time.

His calculations are based on certain general conditions, such as the imposition of rational time-keeping throughout the universe, which are believed to follow from the assumption that the work of a rational being is under consideration: 'Investigators who leave out God, the *raison d'être* of the universe, find themselves lamentably handicapped in dealing with cosmological questions'. There is a lively justification of 'scientific heresy' before this use of the data of revelation; but the theologian as well as the scientist may be somewhat disconcerted, for the power of the creator is limited with remarkable precision, and little enough mystery left to 'the eternal silence of these infinite spaces'.

From the calculation of the motion of matter subject to such conditions there emerge the laws of gravitation and electromagnetic attraction with which empirical observation has long made us familiar. They are no longer 'brute fact', but the consequence of the world's being rationally describable: 'the actual distribution of matter-in-motion in the universe is on the same footing as the laws of nature themselves'. A zero of time, at which matter was concentrated before it began its outward expansion, is also found.

Plato was content to describe his own cosmology as a 'likely tale', and it should be emphasised that Milne's scheme can claim no greater philosophical certainty, however one accounts for the fact that it seems to work. There is a logical fallacy in the assertion that it provides 'evidence of a most conclusive kind that the universe arose from a divine act, located in time'. This is to say that an initial assumption must be true because observation shows that its consequences are true. Moreover, it is surprising to find the question whether we can have real knowledge of what is beyond sense-experience, so much debated by philosophers, thus settled without discussion. We would agree that such knowledge can be reached if we start from observation of the sensible, but not from an abstract description in mathematical terms.

L.B.

HISTORICAL ASPECTS OF ORGANIC EVOLUTION. Phillip G. Fothergill. (London: Hollis & Carter; 35s.)

The idea of evolution, as Dr Fothergill says, is probably as old as the grass on the hillsides. It remained for Darwin, just under a century ago, to put forward the idea of organic evolution in a coherent form, backed by much observation and the weight of a mass of cumulative evidence drawn from many sources. In natural selection he also put forward a *way* in which species could change. The effect of his *Origin of Species* was immediate and enormous. The context of the process is historical, its implications are both philosophical and theological, and controversy, often bitter and often confused, has been carried on till the present day. Within a year T. H. Huxley was welcoming the idea as a stick for beating the Church, and the whole question has been since then an important one for Christians. Recently, in the Encyclical *Humani Generis*, the Pope reminded us that it is still open for research and discussion by experts, for and against, and asked for soberness and restraint in judgment.

Dr Fothergill's book, in view of all this, is particularly welcome, and as Lecturer in Botany in Durham University he speaks with authority. The first part of the book deals, chronologically, with the development of the idea from the time of early myths to the turn of the present century when it had become firmly established. The second part deals