

of Christian asceticism—fasting, insufficient and uncomfortable sleep, poverty, cold. There are thousands of ordinary families in Vienna today who are suffering no less from the cold than Ste Thérèse of Lisieux did. Can these people not only endure courageously (and many do) but also grasp these great involuntary mortifications and, by a conscious, thankful and voluntary acceptance of them, turn them into the spiritual and redemptive force which they potentially are? It is beyond doubt that among the uncompromisingly sincere Catholic intellectuals, among the teachers and doctors and social workers, among the hard-pressed mothers of families, and among the patient old women who come to daily Mass in threadbare coats and leaking shoes, there are many who do precisely that. And the greatest contribution that Austria's friends abroad can make to her regeneration is to unite their prayers to the prayers and sufferings of her children.

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THE UNIVERSE OF SIR EDMUND WHITTAKER¹

AS in the lecture room, so in writing, Sir Edmund Whittaker's presentation of his material is made attractive by a certain elegance. It is apt to fill his hearers and readers with at least a temporary sense that new realms of thought have been rendered thoroughly intelligible to them. His Donellan Lectures (1946) were no exception, if we may judge by this book which holds the substance of them. But elegance is the least important quality of an enquiry so serious in its import as to be concerned with the capability of man's reason to demonstrate that God exists. Hereafter we shall give evidence for what we can only call the scientific levity with which this grave subject is here treated. Let us first express our immense disappointment that the author should handle with such evident lack of understanding, not to say lack of knowledge of what is being talked about, matters that do not pertain to his own science. This is particularly regrettable on the part of one who is so hot against the misdemeanours of philosophers and theologians in their approach to technicalities of physics in which they may be without expert competence. He specifies grounds of serious complaint against the Aristotelians of the seventeenth century. Today it clearly appears that there are equally serious ones on the other side.

It is deplorable that the prestige of great attainments should be lent to 140 pages of misunderstanding that results in continual verbal equivocation. The 'analogy' here defined and depreciated is not the

¹ *Space and Spirit*, by Sir Edmund Whittaker, F.R.S. (Nelson; 6s.)

analogy of the metaphysician and of the Five Ways. When the author believes himself to be setting Aristotelian metaphysics in order, he shows that he has no idea of what metaphysical science really is. The 'logic' of which he thinks the principles liable to change, is not logic, but a particular algebraic calculus. Finally, the Five Ways which he thinks have varied in cogency at different times in dependence on the passing hypotheses of physicists, are not the Five Ways of St Thomas. One does not like to find a scientist and a mathematician committing himself to a prolonged *Ignoratio Elenchi*, but since he insists on writing as a physicist and mathematician about matters which are not physical and mathematical, this state of affairs is not surprising. The existence of God and its demonstrability by reason are not objects of physical or mathematical science.

We give for purposes of further comment, which must necessarily be technical, some of the main positions which the author adopts. They will be referred to in the sequel by the numbers that here accompany them. The quotations have been set out at some length and, we think, fairly.

- (1) The Five Ways start from our knowledge of the same universe that furnishes the subject-matter of modern physics (pp. 3-4). Cf. The assertion 'that the Five Proofs are purely metaphysical, and are independent of any change in our conceptions of the external world . . . can be definitely disproved and . . . abandons St Thomas's fundamental aim of rising from Nature to God' (p. 86).
- (2) The last step in each proof depends on *analogy*, the principle that when two different things show parallelism in some respects we may be justified in attributing to one of them something which we know definitely of the other and which is associated with the respects in which there is parallelism (p. 36).
- (3) Analogy, like induction, is essentially an inference from sampling . . . there can be no absolute certainty in an argument which infers the existence of unknown entities from the mere fact of the existence of certain other entities (p. 37).
- (4) The concept of 'cause' has been greatly modified since Aristotle's time, and his notion of it has been replaced in modern physics by the concepts of mathematical law and predictability; the repercussions of this changed situation on natural theology will be . . . taken up later (p. 36).
- (5) It is evident that principles such as those of causality and analogy carry us beyond direct observation and experiment, and belong . . . to metaphysics in fact; and this explains why the proofs have no coercive, as opposed to prudentially certain, character: it is because there is no general agreement on questions of metaphysics (p. 37).
- (6) The fundamental principles of logic are liable to change (n. 38).
- (7) The degenerate schoolmen occupied themselves with futile subtleties that bore no relation to life or reality: they argued about

homogeneities and heterogeneities, categorematices and syncategorematices, simpliciter and secundum quid: they resolved questions by the way of formaliter, materialiter, fundamentaiter, eminenter (p. 60).

- (8) It was admitted (by the Aristotelians of the seventeenth century) that some perceptions must be received from the real sensible world in order to furnish the beginnings of knowledge . . . that things come to be and cease to be, and that things actually existing are subject to constant change. It was held that metaphysics, working on this material, by sheer analysis discovers the notions of potency and act, and identifies change or motion or becoming as a passing from potency to act. . . . The claim that metaphysics need not be based on anything but the most infantile kind of observation, breaks down on a close examination (pp. 67-8).
- (9) The time of break-up of a radium atom is unpredictable . . . in principle; there is a genuine indetermination, a failure of the postulate of causality . . . and a striking illustration is thereby provided of the dependence of metaphysical axioms on observational facts (pp. 112-3).
- (10) There was an epoch about 10^9 or 10^{10} years ago . . . which represents the ultimate limit of science. We may perhaps without impropriety refer to it as the Creation (p. 118).
- (11) Happily, the progress of science has made possible a restatement which not only restores the cogency of the general argument of the Second Proof, but may perhaps be regarded as strengthening it (p. 124).
- (12) The proof from Order is today more complete, more comprehensive, and more majestic than in the form in which it was presented in the thirteenth century. . . . If we have in any way arrived at the conviction that God exists, modern cosmology points to the further conclusion that He must be, in one aspect at least, extramundane (pp. 130-1).
- (13) We must beware of the 'fallacy of transcendent inference'. The newer form of the (Fifth) argument is less open to this criticism; for it first discloses an intramundane God, and then, by a second step, so to speak, elevates Him to a supramundane status (pp. 131-2).

Materially, the statement first quoted in (1) is obviously true. St Thomas, as Sir Edmund recognises with approval, insisted that he was arguing from and about things, not ideas. But formally the immediate subject-matter of the Five Ways and of physics, ancient or modern, is different. We think that the non-recognition of this fact is at the root of the demands which this book makes in regard to the proofs. The Five Ways begin from things considered formally as beings, beings as moving beings, beings as necessary or contingent beings, beings as causing or caused beings, and so on. Physics is not concerned with entity as such but formally with motion, or it may be

numerability. There is a formal difference, a difference of intelligibility, between moving being *qua* being, and moving being *qua* moving, a difference which gives rise to specifically distinct sciences with different scopes and capabilities and methods. St Thomas was indeed trying to 'rise from Nature to God' but not formally from Nature as considered by the physicist; from mobile nature certainly, but in its entitative aspect.

Those two manners of investigation being formally independent, there is no reason why the metaphysical notion of 'cause' should be modified coincidentally with modifications in the physical notion (4). Fresh mathematical descriptions of the physical world may give the metaphysician new, explicit and detailed content for his universal concepts—(we say, 'may give', for, as the author points out, mathematical coherence is no guarantee of physical reality); but if those concepts are genuinely in the metaphysical order, this detailed information will not affect their implications and connections in that order. Of course, if the physicist or mathematician is resolutely determined that his own manner of abstraction is ultimate, he has no further choice but to view the abstractions of the metaphysician as 'verbal futilities' (*Appendix*) and to see the apparatus proper to sciences of being as such and of *ens rationis* as signs of degeneracy (7).

In such treatment there is the same kind of methodical blindness shown as in (6). the grounds for which statement are that Brouwer devised a three-valued logic in which the principle of excluded middle cannot be expressed—Sir Edmund says, 'is not assumed'. Such a description of the three-valued logic could not be given if it was viewed logically and not from the standpoint merely of its own symbolism. If an algebraic system of propositional functions is constructed on the express hypothesis that any such function may have one of three or more truth-values (for systems of any number of truth values can be constructed), it is clearly impossible, *ex hypothesi*, to express in that system a tautological necessity of a function having only one of two values. That does not prevent its remaining true, both generally and for that system, that a given function either does or does not have some one of the values which the system allows to it, *omni medio excluso*. The traditional logic which is represented as being stifled by the principle of excluded middle does in fact take cognizance of a third truth-value besides true and false, viz. that pertaining to propositions concerning future contingents (cf. Aristotle, *Peri Hermeneias* 19a and St Thomas's Commentary).

Turning to the treatment of the Five Ways, (2), (3), (9), and (11)-(13) give a fair idea of the author's general view of their nature and cogency. He represents the account of them as metaphysical rather

than physical as a refuge to which seventeenth century Aristotelians betook themselves when faced with un-Aristotelian presentations of the physical world. The authority for this we do not know. All previous treatment of the proofs by the great commentators on St Thomas had been clearly metaphysical in principle. That such treatment was proper would seem to be granted in (5). But in the second half of that passage the word 'metaphysics' is rendered equivocal owing to the subjective and objective cogency of metaphysical demonstrations being confused.

While 'being' is the most elementary and primary apprehension of the mind and may therefore be called 'infantile' (8) if it is so desired, its exploration and analysis precisely as being rather than as animal, human, quantified or qualified being, is the highest natural achievement of the human reason. Being as being is in itself the most intelligible of intellectual objects, but for a mind whose most natural activity is to know being in the objects of sense, it is a supremely difficult task to abstract from sensible conditions completely and to articulate conceptually the structure of being in itself. The principles and demonstrations which result from such articulation have in themselves and objectively the highest certitude; the Five Ways metaphysically formulated are much more cogent than the unscientific versions of them which readily occur to men. Subjectively, however, one would not expect them to be found universally, or even generally evident, precisely because of the difficulty of attaining and remaining at a metaphysical level of abstraction.

But the proofs, it may be objected, are open to attack on the score of 'fallacy of transcendent inference' (13) or unjustified extrapolation. And if the metaphysical doctrine of analogy be brought in to close this breach, it will be said, (2) and (3), that 'analogy is essentially an inference from sampling' and that 'there can be no absolute certainty in an argument which infers the existence of unknown entities from the mere fact of the existence of certain other entities'. The account of analogy given in (2) bears no likeness that we can discern to the Thomist conception of the analogy of being, and this is not the place to develop the latter from its elements. The formation and use of analogical concepts is no more a matter of sampling than the formation and use of univocal concepts in use in all sciences. The last part of (3) could not have been phrased more unfortunately, since it is precisely through the character of their entity that any imperfect beings do imply with absolute necessity the existence of at least one other being.

Therein lies the essential principle of the Five Ways. The author is entirely consistent in denying the principle and the scientific cogency of the proofs together. Yet of cogency he speaks (11) in con-

nection with the Second Way. In view of his belief that the 'postulate of causality' has been disproved (9), and that its most accurate form in his eyes is a formula for *predicting* physical conditions given certain anterior physical conditions, one may doubt whether he is consistent in using the term 'cogency' of a proof which he presents as a temporal *regression* of causes. What he regards as the newly-increased strength of the proof (11) comes from the scientific pointers to the epoch mentioned in (13).

The truth is that (a), in regard to (9), the supposedly proven physical indeterminacy of any number of physical objects would not prove that they had no cause in some other order; (b) St Thomas, for the purposes of the Second Way, was unconcerned whether the chain of physical causes was finite or infinite in time—it was not a temporal sequence that he was considering but an entitative one; (c) the physical evidence for an absolute beginning of the physical order is about as cogent as the author considers the metaphysical statement of the Five Ways to be.

The Third Way receives little attention, the Fourth is deliberately and understandably left out of detailed consideration. The author's attitude to the Fifth is sufficiently shown by (15) and (16). By itself, he thinks, it admits of a pantheistic conception of God. If, as Cajetan thought, the proof concludes to an Intelligence which is Pure Act, the pantheistic possibility is in fact excluded. Of the treatment of the Second Way we have just written. There remains the First, which naturally shares with the Second the largest part of the author's attention. To it he devotes an appendix, in which he pours out a full measure of scorn on the Aristotelian metaphysics of movement. We are not here debating with 'Franciscans', 'Ockhamists' and 'opponents' under whose historical cover most of the attack is launched. We note, however, that the proof from motion can be formulated with no use of the phrase, *Nemo dat quod non habet*. Even if we were to grant its metaphorical character in connection with metaphysical and physical subjects, there is nothing remotely metaphorical about the principles, *Nil agit nisi in quantum est in actu* and *Nil patitur nisi in quantum est in potentia*, nor are they irrelevant to states of motion considered as ways of being.

With regard to the final paragraph in which it is contended that the mover may be an accident of the moved, such a mover is by no means self-explanatory. So far from the case being with difficulty adaptable to St Thomas's concepts, it forms a principal part of his consideration in *Contra Gentiles* I 13, even if not in the compendious sketch of the proof here quoted from the *Compendium Theologiae*.

The passages we have chosen for these comments are only a small though representative number from many more that are available,

On p. 133 we read of a desire on the part of some physicists to systematize 'the rough home-made metaphysics which is implicit in modern scientific writings'. This book may be intended as a contribution to that process, but we can only see it as a piece of the destructive tinkering which is the issue of so many attempts at home-made science.

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O B I T E R

'THE TASK OF THE CHURCHES IN GERMANY' (S.P.C.K. and Sword of the Spirit, 6d.), the report of the delegation of British Churchmen which visited the British Zone last autumn, is in many ways a heartening document. It is generally recognised now that the Catholic and Evangelical Churches in Germany were the only consistent core of opposition to the deeper evils of Nazidom. Einstein's testimony is quoted, in which he describes how he turned in vain to the Universities, to the press, to men of letters, for the defence of freedom. 'Only the Church opposed the fight which Hitler was waging against liberty', he concludes.

'The problem of physical survival is a predominant problem for all Germans, and is naturally a main preoccupation for churchmen. Further, in addition to the lack of food, of coal, of housing, of clothes, schools and transport, the lack of any tolerable and discernible future, and the haunting fear of arrest or re-arrest on an unspecified charge of Nazi activities in the past, are said to have produced widespread despair and an attitude of cynical indifference to all moral considerations'.

Such is the background, and the burden of the delegation's recommendations is that the Christian bodies should be given every help to continue and expand their work for the material and spiritual recovery of the German people. They stood firm in the evil hour, and should now be given the fullest liberty if, as was so frequently said by propagandists during the war, Britain really stands for the maintenance of Christian civilization. The crucial questions of the economic future of Germany, the policy of denazification (the commission urges that an end should immediately be put to the iniquitous re-creation), the repatriation of prisoners of war, the provision of proper facilities for education—in all these matters Christians are obviously deeply involved. But in such lesser matters as the allowance of paper for books, of coal for heating and the restrictions on travel, Christians *as such* should not be penalised. The future of Germany—and that is to say the future of Europe too—is largely in their hands.