

GALILEO'S REVISED TRIAL CRITICALLY REVIEWED. AN EPISTEMOLOGICAL AND AXIOLOGICAL APPROACH

Ought Galileo have been forced to swear solemnly on the Bible, that (a) «the opinion whereby the Sun is at the centre of the universe and is motionless, must be senseless and philosophically false because it contradicts Scripture»; and that (b) «the opinion whereby the Earth is not the centre of the universe, but is subject to motion, indeed to daily motion, is also philosophically insane and when theologically examined, leads to an erroneous conclusion»? What we now definitely know about the background to this shameful episode in cultural history may be traced as follows.

1. The Context. The geocentric Ptolemaic system which emerged early in the second century B.C. at Alexandria, for several centuries permitted an at least partial explanation of enormous difficulties in cosmology and astronomy. But it was a scientific step backwards from the heliocentric Aristarchean system¹. This had emerged roughly a century earlier, also at Alexandria, and it too left unexplained some astronomical problems, due to insufficient means to scientific measurement at the time. What is hard to understand is the insistence of the early seventeenth century consciousness on the Ptolemaic vision of the universe. For it had already been proved inadequate by the theories of Copernicus and Kepler, Galileo's predecessors. Galileo himself had never been a strict mathematician, unlike these two thinkers, who tried to solve fundamental astronomical problems by pure mathematics. Galileo's main contribution in this field was to combine scientific observation with mathematical calculus, and to conceive the idea of some kind of universal attraction. This made him in his turn Newton's forerunner. He undoubtedly contributed to the introduction of dynamics as an integral part of mechanics; but he was able to do so only by converting the telescope into a scientific instrument. He did not expose any really new heliocentric theory; he merely validated the existing one, with quite remarkable ingenuity, and made it explicit by proving, illustrating and extending it in practice, though not to the comprehension of every contemporary mind. His fame overshadowed and offended many of his contemporaries. The case of Galileo is above all a typical case of envy and intrigue. Several

1. Cf. E. MOUTSOPOULOS, Sur l'origine philosophique possible du modèle de l'univers aristarchéen, *Diotima*, 12, 1984, pp. 175-177.



books written or inspired by Galileo's predecessors had already been published without offending the Catholic Church. Galileo's own writings were not placed on the Index for some years, until his enemies denounced their contents as heretical to the dignitaries of the Catholic Church. In Galileo's dialogue in the systems of Copernicus and Kepler², one of the characters is the spitting image of the Pope, disguised under the name of Semplicio. By a very odd and striking coincidence, Galileo's trial before the dignitaries of the Church lasted the same number of days (four) as did the action of the dialogue which was the cause of his official indictment.

2. The Epistemological Aspect. The epistemological issue that brought Galileo face to face with the religious court had been aired for a very long time, though only as a theoretical hypothesis. What made it so pertinent now was the fact that Galileo had proved it scientifically, by thorough and irrefutable observation corroborated inductively. Its most dangerous consequence was that the Earth ceased to be the centre of the planetary system, but that one of the authorities on which the cosmological teaching of the Catholic Church had rested for centuries was suddenly found to be scientifically invalid. This being so, other authorities too might come to grief in the future. Sophistries which had been described and analyzed centuries previously by Aristotle³ and illogical trickeries which would be identified and criticized some twenty years later by Pascal⁴ played a substantial role in the case of the Catholic Church against Galileo. Stubbornness, hatred and calumny reared their heads. The reliability of doctrines established and venerated for long centuries, and even the reliability of the Catholic Church itself, which had been astutely advised to adopt them, was at stake. The Church could not draw back from the brink. Though it might have overlooked the Copernician and Keplerian theories (in so far as they were not put on the Index for their heretical content), the critical, the kairic moment had now come, when everything had to be decided for the present and for the future. The Catholic Church could not afford to see its own authority jeopardized. Any comparison between a mere individual and a time-honoured institution was not to be tolerated. The Church therefore decided to make an example of the turbulent

2. Galileo GALILEI, *Dialogo sopra i due massimi sistemi del mondo...*, «in which for four days the two most important cosmic systems of Ptolemy and Copernicus are discussed in conversation and where the philosophical and physical arguments are exposed without prejudice», Firenze, 1632. Cf. P. FEYERABEND, *Against Method*, London, 1975, chap. 7.

One should not forget that even Kepler had not dared to explain natural, i.e. celestial, phenomena without referring to religion. He namely explained some anomalies observed in the motion of planets by inventing a new «prime cause», that of the *angelus rector* supposed to constantly correct this motion.

3. Cf. ARISTOTLE, *De sophisticis elenchis*, 2, 165 a 38 sq.

4. Cf. PASCAL, *Pensées*, éd. L. Brunschwig: «puissances trompeuses».



scientist, and simultaneously to cow in advance any other turbulent mind that might one day speak out. The real epistemological issue was thus transferred from the ordinary scientific level and became a defence of a establishment against scientific elements threatening to destabilize its supremacy. The Church had to win, by fair means or foul, in this confrontation. As for the accused, he could only rely upon the evidence of his proofs, which his accusers were unable to comprehend rationally, and which they ultimately ruled out of order, in an access of passion. The moment had arrived. Would science, and would the human conscience, accept or deny a real scientific revolution, one which had begun long before, but was now being condemned as controversial and contradictory, if not in itself, at least when set beside the allegedly scientific and scholarly data? For the first time in the history of science, observation had become more than just a method: it had become a criterion of the validity of a rational conception. Such an idea (said the Church) must be eradicated from the minds of scientists and of thinkers, for whom Thomistic Aristotelianism had hitherto been the only yard stick of cogitation⁵. When Descartes, who had been nourished on Scholasticism, tried to free philosophical thinking from its dominion, it was through scholastic devices that he chose to proceed. Galileo, by contrast, had no such option, owing to the strictly scientific nature of his own contribution. He was committed to accept and follow the new methods of Italian scientists: controlled observation and drawing up of tables (*tabulae*). These methods Francis Bacon had already adopted and turned to use⁶. A new scientific era had begun, and Western Theology could easily have come to terms with it, as it was compelled to do later, had hatred and other fatal passions not prevailed.

3. The Axiological Aspect. From an axiological point of view, it is necessary to repeat what has already been stressed: the attitude of the Catholic Church towards the new scientific data that emerged from Galileo's contribution was instigated not so much by the Church itself, as by persons who had a special interest in denigrating Galileo's achievements, and who wanted them officially condemned. Ever since its founding years, the Christian Church as a whole had had to undergo numerous adaptations to new realities, and its flexibility in this respect allowed it to survive and, historically, to become the oldest and steadiest cultural institution in the world. The Christian dogmatic system was gradually elaborated by the Church Fathers and the Ecumenical Councils, through the acquisition and the elimination of ideas. Christia-

5. Cf. E. MOUTSOPOULOS, *The Reality of Creation*, New York, Paragon, 1991, chapter 3: Science and Spirit: the Platonic Model, pp. 31-44.

6. Cf. Fr. BACON, *De dignitate et augmentis scientiarum*, L, V, II: «*experientia vaga*» and «*experientia litterata*». On the establishment of the *tabulae*, cf. IDEM, *Novum organum*, L, I, C-CII. Cf. *ibid.*, XLIX: «The more man wishes that an opinion be true, the more he believes it easily».

nity has always displayed a very liberal character, and has remained open to life and its particular problems. Heresies were scrutinized and rejected only because they included internal contradictions. Christianity has never been afraid of new ideas, and in Galileo's case there was really nothing to worry about, as far as the integrity of Christian creeds within the Catholic Roman Church was concerned. What occurred afterwards -the adoption of the Copernician Revolution and its harmless integration into the Christian faith- might have occurred at any time previously. The problem thus remains an axiological one, how to evaluate to what extent collective Ecclesiastical conscience can accept scientific evidence without misgivings. This is not a theological issue, for Christian dogma has empirically not been affected by any scientific evidence. There was admittedly one hurdle to be cleared. By accepting the new evidence of scientific theory, the Church had to admit that the Earth was not the centre of the Universe. Hence, from a theological standpoint, the Earth might lose its presumed character of cosmological uniqueness. But even so, the Earth would still retain an essential feature: not its status as all unique celestial body, but its status as a privileged one. For life and, above all, the presence of humankind on Earth as a unique continuous event are unquestionable facts. Hazard, as a cosmological hypothesis⁷, does not enter into Christian theology. Thus the ideas which the Copernician Revolution and its Galilean extension involved and promoted were (and have ever since proved to be) harmless to Christian faith. Indeed, they have turned out to be starting points for further scientific development. To understand why the Catholic Church allowed itself on this occasion to be influenced by personally motivated denunciations, one must take into account its internal problems at the time. For some decades its authority had been severely contested in various areas of Northern Europe. This was felt to be a deep crisis, to which it was needless to add another. Galileo's accusers would certainly have seen direct or indirect acceptance of his new ideas by the catholic authorities as new evidence of weakness. There was also tradition of combating heresy by ruthless methods. The Inquisition had been developed for this purpose some centuries previously within the Catholic Church, and its instruments were nominally still in force. Given the circumstances, the severity and inflexibility of the Catholic Church in this case is understandable, though not excusable⁸. But nevertheless the hounding of Galileo is one of the Church's misdeeds. In the case of Giordano Bruno we are confronted with what one might term a crime⁹. Galileo's condemnation was worse than a crime: it was a preventable error.

7. Cf. J. MONDO, *Le hasard de la nécessité*, Paris, 1970.

8. Cf. Cl. BÉRIGARD, *Dibutationes in dialogum Galilaei pro terrae immobilitate*, Florence, 1762.

9. Cf. E. MOUTSOPOULOS, *Cognition and Error*, Athens, 1961, pp. 37 sq.; IDEM, *Knowledge and Science*, Athens, 1972, pp. 134-141.



4. A critical Survey of the Propositions. Let us now return to the two propositions with which we started. Even if there was meaning in their construction in 1632, it completely has disappeared in the years between. Their very structure is today contradictory and hence erroneous. Clearly, the two propositions are considered to be complementary. The first refers to the Sun, whose motion around the Earth had already been called into question (Copernicus). The second refers to the Earth, whose immobility had similarly been questioned. Each of these propositions claims to be independent of the other. But in fact each presupposes the other and is in any case correlative to it. They are without doubt both negative responses to assumed conclusions of Galileo, which they intended to refute. The difference between Galileo's propositions and those of his opponents is that his derive from painstakingly argued ideas with some mathematical basis, whereas theirs lack either argumentation or rationality. Galileo's reasoning led to two enthymemes with two corresponding complementary syllogisms whose premisses were so self-evident as to be omitted. They had however appeared *in extenso* in the reasoning that was assumed to precede them, and above all in the observational evidence set out in the appropriate Tables. There is obvious syllogistic coherence in this presentation, since no reference to «prime causes» is found. By contrast, the two propositions which Galileo was forced to assent do lack any kind of logical coherence. They too consist of enthymemes, each followed by another clause (single in the first case, twofold in the second case), containing its justification. This clause in turn corresponds to a set of premisses. In each proposition the lack of coherence is betrayed by the fact that the set of its premisses refers not to immediate data, but to general assumptions. The first of these is that an opinion contradicting Scripture is senseless and false. The second is that an opinion which contradicts theologically accepted truths must lead to an erroneous fact. In the particular instance of Galileo's second enthymeme, this premiss implies that it is philosophically invalid. The first premiss insists that Scripture should be adhered to. The second premiss insists that theological tradition too should be adhered to. Meantime, Galileo's conception of the Earth's motion is made out to be invalid from a philosophical point of view. In actual fact, the first proposition lays claim to respect for the *letter*, not the *spirit* of Scripture, and the second proposition lays claim to respect for specific theological doctrine. The really inadmissible thing is the alleged philosophical invalidity of Galileo's theory. Obviously, the view of philosophy as «Theology's handmaid» lies behind all these accusations, and it was a view soon to disappear for ever. Four years earlier, in the *Regulae*, published in 1628, Descartes had accepted that evidence was the first of all vantage grounds in the quest for truth.

Galileo's trial was a fiasco for conservatism and obscurantism. But time and again, conservatism and obscurantism are symptoms of the vitality of human

societies in their dialectic historical process, just as rationalism and progressiveness are. It is important to avoid the one and to seek the other. In Galileo's case the victory of obscurantism was due only to human weakness. Is this not an almost universal fact? The fate of human kind is, after all, enviable, with all its splendour and all its misery. That has been so ever since the days of Thucydides¹⁰, who was the first to interpret facts in a philosophical way, and so it will ever remain. Our scientific and technological progress is obvious. Our moral progress is less obvious, although it cannot be denied in the whole. Galileo's case may serve human society as an example and as a means of averting the future recurrence of intellectual obstructiveness.

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**ΚΡΙΤΙΚΗ ΑΝΑΘΕΩΡΗΣΗ ΤΗΣ ΔΙΚΗΣ ΤΟΥ ΓΑΛΙΛΑΙΟΥ.
ΕΠΙΣΤΗΜΟΛΟΓΙΚΗ ΚΑΙ ΑΞΙΟΛΟΓΙΚΗ ΠΡΟΣΠΕΛΑΣΗ**

Π ε ρ ί λ η ψ η

Ἡ δίκη τοῦ Γαλιλαίου ὑπῆρξε μιὰ ἀποτυχία γιὰ τὸν συντηρητισμὸ καὶ τὸν σκοταδισμό. Ὡστόσο συντηρητισμὸς καὶ σκοταδισμὸς εἶναι, ἀπὸ καιροῦ εἰς καιρόν, συμπτώματα τῆς ζωτικότητος τῶν ἀνθρωπίνων κοινωνιῶν κατὰ τὴν διαλεκτικὴν ἱστορικὴ τους πορείαν, ὅπως καὶ ὁ ὀρθολογισμὸς καὶ ὁ προοδευτισμὸς. Σημασία ἔχει ν' ἀποφεύγωνται οἱ μὲν καὶ ν' ἀναζητοῦνται οἱ δέ. Στὴν περίπτωση τοῦ Γαλιλαίου, ἡ νίκη τοῦ σκοταδισμοῦ ὀφείλεται μονάχα στὴν ἀνθρώπινη ἀδυναμία. Δὲν εἶν' ὅμως αὐτὸ ἓνα σχεδὸν καθολικὸ γεγονὸς. Μ' ὅλο τῆς τὸ μεγαλεῖο καὶ τὴν ἀθλιότητα, ἡ ἀνθρώπινη μοῖρα ἀποβαίνει, τελικῶς, ἐπιθυμητή. Τοῦτο πάντοτε συνέβαινε, ἀπὸ τὴν ἐποχὴν τοῦ Θουκυδίδη, τοῦ πρώτου ἱστορικοῦ ποὺ ἐρμήνευσε φιλοσοφικῶς τὰ γεγονότα, καὶ θὰ συμβαίνει ἔσαεί. Ἡ ἐπιστημονικὴ καὶ τεχνολογικὴ πρόοδος τῆς ἀνθρωπότητος εἶναι ἐμφανής. Ἡ ἠθικὴ τῆς πρόοδος εἶναι ὀλιγώτερον ἐμφανής, μολονότι δὲν δυνάμεθα νὰ τὴν ἀρνηθοῦμε στὸ σύνολό της. Ἡ περίπτωση τοῦ Γαλιλαίου εἶναι ἐπιδεκτικὴ ἀξιοποιήσεώς της ἀπὸ τὴν ἀνθρώπινη κοινωνία ὑπὸ τύπον παραδείγματος καὶ μέσου πρὸς ἀποφυγὴν μελλοντικῶν ἐπαναδρομῶν πνευματικῆς ἐμφράξεως.

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10. Cf. THUCYDIDES, II, 87; III, 58.

