The Christian Origin of Modern Science

Alexandre Kojève

Translated by David R. Lachterman

"The Earth is a noble star."
Nicholas of Cusa, *De docta ignorantia*, II, 17

Translator's Preface

Alexandre Kojève (1902–1968) is probably best known to the readers of The St. John's Review *as the author of the influential book* Introduction à la lecture de Hegel, *Paris 1947; 1968,*[2] *abridged English translation:* Introduction to the Reading of Hegel, *trans. James H. Nichols, Jr., New York N.Y. 1969; of the essay, "The Emperor Julian and His Art of Writing," in* Ancients and Moderns. Essays on the Tradition of Political Philosophy in Honor of Leo Strauss, *ed. Joseph Crospsey, New York 1964, pp. 95–113; and of the section "Tyranny and Wisdom," in Leo Strauss,* On Tyranny, *New York 1963,*[2] *pp. 143–188. In addition he wrote a three-volume study of the history of ancient philosophy,* Essai d'une histoire raisonnée de la philosophie païenne, *Paris, 1968–1973, with a posthumously published sequel,* Kant, *Paris 1973. Most recently a manuscript dating from 1943 has been published under the title* Esquisse d'une phénoménologie du droit. Exposé provisioire, *Paris 1981. The essay translated below appeared in a two-volume collection celebrating the work of his fellow-Russian and compatriot in exile, the distinguished historian of science Alexandre Koyré:* Mélanges Alexandre Koyré, II: L'Aventure de l'esprit, *Paris 1964, pp. 295–306.*

The reader might be aware of Kojève's gift for the "canular-esque," a "put-on," as we might call it.

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Few historical facts give rise to as much controversy as the connection between modern science and technology, on the one hand, and religion, namely, Christian theology, on the other.

To be convinced of this we need only confirm that the incredible strides made by modern technology clearly presuppose a theoretical science with a universal mission, a science allowing the possibility of presenting all perceptible phenomena to the naked eye or to the armed [armé] eye as visible manifestations of invisible relations and as manifestations corresponding, in an absolutely rigorous fashion, not to human speeches of any sort, but to mathematical formulae or functions referring to these phenomena in an exact way. We can, if we wish, call this science "mathematical physics." However, it then becomes important to make precise that this "physics" is not limited to some part of the universe or to some of its particular facets; supposedly, it must and can cover, without any exception, everything which can be observed (that is, *seen*, at least in the final analysis.)

No one will disagree that this mathematical physics with its universal mission was born in western Europe in the sixteenth century and that it cannot be found at any other time or in any other place. No doubt, we can find some small portion of it in our own day everywhere in the world. However, it remains no less true that it is only to be found when Christianity is present, if not as a religion, then at least as the civilization we have no reason not to call "Christian."

No doubt, it is not only the absence of baptism that prevented and still prevents savages from devoting themselves to mathematical physics. But what prevented the subtle Chinese thinkers from doing so, the thinkers who imposed upon enormous masses of people a highly differentiated and extremely refined civilization? Why

didn't the Indians, who benefitted from the Hellenistic arts and sciences and in turn made many other peoples the beneficiaries of those, why did they never try to surpass the exiguous limits of their heritage? How did it happen that many great Jewish thinkers, who very much wanted Judaism to have a share in certain intellectual efforts of the civilized pagans, never attempted to contribute anything at all to the development of those ideas which could some day become a science in the strict sense? And the Arabs—not prevented by Islam from actively contributing to the development and propagation of the Hellenistic civilization they were the first to renew—why didn't the Arabs try to mathematicize, for example, the chemistry they discovered, instead of being content to assimilate and perfect only the pure or celestial mathematics of the Ancients?

In short, no non-Christian people was able or wanted to surpass the limits of Hellenic science. Now, the fact is that the Greeks, who did not want or were not able to pass beyond the limits of their own science, were all pagans.

Since it is difficult to maintain that the Greeks were pagans *because* they did not do mathematical physics, it is necessary to suppose (unless we claim that civilization is a chaos of completely unrelated elements) that they were not able to work out such a physics because they wanted to remain pagans (unless we admit, something which would be perhaps misplaced in the present volume, that Hellenic science and pagan theology are independent, but complementary, manifestations of one and the same phenomenon, which would have a non-discursive character since it would belong to the domain of action).

Now, in my opinion at least, this assertion is much less of a put-on [*canularesque*] than it might seem at first sight.

No doubt, in order to take this assertion completely seriously, we would first have to agree about exactly what "classical" Paganism is, or more precisely, about the theology that served as the back-cloth to Greek philosophy from Parmenides to Proclus and, hence, whether one wishes it or not, to Hellenic science as a whole. But, in view of the clear impossibility of arriving at such an agreement, I shall content myself with saying briefly what Paganism would *have* to be for the assertion at issue to be acceptable, if not accepted.

In opposition to Christian theology, "classical" pagan theology would have to be a theory of the *double* transcendence of God. In other words, it is not enough for the pagan, as it is for the Christian, to die (in certain suitable conditions) in order to find himself face-to-face with the Divinity. Even when he disencumbers himself totally of his body (something of which the Christian, moreover, has no need), the pagan is stopped in midcourse in his ascent towards God by a screen which, if not opaque, is at least impassable, a screen, if one wishes, which is "divine" in the sense of trans-mundane or supraterrestrial, but in relation to which the god properly so-called is still and remains forever transcendent. The *theos* of "classical" paganism is not only beyond the world where the pagan lives. This *theos* is still irremediably beyond the 'Beyond' to which the pagan can eventually gain access after his death. By departing from the earth the pagan is never on the path which could bring him close to his God.

It matters little, moreover, whether this screen which is thought to separate God from the world where the pagans live and die is constituted, as it is for Plato, by an ideal utopian Cosmos or, as it is for Aristotle, by the ethereal heaven of the planets and the stars, a heaven without any precise position in infinite, empty space, but nonetheless itself quite spatial. What matters in both of these cases is the absolute impossibility for the pagan as well as for his god of breaking through this ideal or real barrier. For, if the theory (contemplation) of the Platonic *cosmos noētos* or the Aristotelian *ouranos* is a summit which pagan man could not outstrip, neither in his lifetime nor after his death, these same *Ouranos* and *Cosmos* are also for him the extreme limit of the possible manifestations or incarnations of his god. With the two exceptions of what is in no place at all and what is in the heavens, *everything* in the world of the classical pagans is everywhere and always profane. Now, if the *theos* of classical theology is the *nunc stans* of a point-like eternity or the uncountable, unique, all-embracing Whole, the transcendent world where this *theos* manifests or incarnates itself cannot be other than a well-ordered ensemble of rigorous relations, fixed from eternity among eternal and exact numbers (it makes little difference whether these are the ordinal numbers that Plato seems to assign to each of the Ideas or the cardinal numbers which measure the radii of the Celestial spheres in Eudoxian-Aristotelian cosmology).* Inversely, in relation to this world which is still, or already, divine, the profane world where we live (it makes little difference whether it is the totality of the cosmos or only the sublunary portion of the cosmos) could not sustain truly mathematical or mathematizable relations. Far from being *one* or formed of orderable or denumberable unities, this profane world is constituted by fluctuating elements, which, whether they divide themselves incessantly in an indefinite manner or transform themselves insensibly everywhere and always into their "contraries," are by definition purely qualitative.

Thus from the point of view of classical pagan theology, we can find "mathematical laws," that is, precise and eternal ratios, only where there is no matter at all, or at the very least, where this matter is only a pure ether inaccessible to the senses. From the point of view of this theology it would be impious to search for such laws in the gross and vulgar matter of the sort which constitutes the living bodies which serve us temporarily as prisons. And this is why for convinced pagans such as Plato and Aristotle the search for a science such as modern mathematical physics would be not only a great folly, (as it would be for all the civilized Greeks, who, because civilized, were predisposed to occupy themselves with the

*See Kojève's *Essai d'une histoire raisonnée de la philosophie païenne,* Tome II, pp. 96–100; 298–300 for further discussion of the character of numbers in Plato and Aristotle.

sciences,) but also a great scandal, exactly as it was for the Hebrews.[1]

Let us admit that a believing or convinced pagan cannot do mathematical physics. Let us also admit that it is not sufficient, in order to do mathematical physics, not to be pagan or to stop being one, inasmuch as conversions of pagans to Buddhism, to Judaism, or to Islam have not been very fruitful from the scientific point of view. But is it really necessary to be or to become *Christian* in order to be able to devote oneself to mathematical physics?

At first glance we would be tempted to answer "No." On the one hand, for almost fifteen centuries Christian civilization did very well without mathematical physics. On the other hand, the promoters of modern science were not, as a general rule, particularly well viewed by the Church. However, these two arguments do not resist even slight examination.

First of all, even if the fifteen centuries in question were incontestably Christian, Christianity was far from having penetrated all the regions of culture in this epoch. No doubt theology and, to a certain degree, morality (if not law) were quite quickly Christianized (the Christianization of theology itself, besides, was by no means complete). But, if we can see, for example in Gothic style, the first specifically Christian art (because willfully contrary to the "nature" of wood and stone), we ought not to forget that it took more than ten centuries before it came about. As far as philosophy is concerned, the enormous effort of the entire Middle Ages had, if not as its goal, at least as its result, to rediscover more or less authentic (and therefore pagan) Platonism and then Aristotelianism which the fathers of the Church were only too ready to neglect in favor of their new, authentically Christian theology, authentic, that is, for the most part (at least if we abstract from the patently, if well-intentioned, Neo-platonic aberrations of an Origen or a Marius Victorinus, and indeed, the put-ons which Damascius published under the name of Dionysius the Areopagite** or the ironic writings of the classical philosopher Clement of Alexandria). And the situation was almost worse in regard to science properly so-called. The Church, rightly and effectively preoccupied, before everything else, with preserving the purity of the faith, that is, the authenticity of Christian theological dogmas, surveyed the sciences and philosophy with a rather distracted (and often far from competent) eye, so that paganism quickly came back into its own. This distraction of the responsible ecclesiastical authorities sometimes went so far as to bring them to defend certain incontestably pagan philosophical and scientific theories against apparently good Christians who wanted to Christianize those theories.

Whether one likes it or not, the promoters of modern science were neither pagans nor atheists, nor anti-Catholics as a general rule (and they were the latter only insofar as the Catholic Church seemed to them still tainted with paganism). These savants were combatting Scholasticism in its most developed form, namely, Aristotelianism restored to all of its pagan authenticity, whose incompatibility with Christian theology was clearly seen and clearly shown by the forerunners of the new philosophy (which, starting with Descartes, tried for the first time to become Christian itself and which became so effectively by and for Kant.)

In short and at least in fact and for us, if not for these forerunners themselves, it is because they, in their quality as Christians, fought against science insofar as it was pagan that the various minor, mediocre, and great "Galileos" were able to elaborate their new science, which is still "modern" because it is our own.

Even while admitting that modern science was born from a conscious and voluntary opposition to pagan science and while affirming that an opposition of this sort appeared only in the Christian world relatively late and only in certain social milieus, we can ask ourselves what particular dogma of Christian theology is, in the last analysis, responsible for the (relative) mastery that Christian peoples (and they alone) exercise today on atomic energy (a mastery, appearing in the period of the end of history, which can contribute only to the prompt reestablishment of paradise on earth, without ever doing any harm, physical harm at least, to anyone whomsoever).

To answer this question, it seems enough to survey rapidly the great Christian dogmas of the unicity of God, creation *ex nihilo*, the Trinity, and the Incarnation, neglecting all the others (in any case, derivative or secondary and even reflecting, in certain cases, after-effects [séquelles] of Paganism).

Now, as for monotheism, its responsibility is clearly irrelevant, since we find it in a pure state both among developed pagans as well as among Jews and Moslems, who are irremediably backward from the scientific point of view. As for creationism, since we also find it in an authentic form in Judaism and in Islam, it is certainly not responsible for modern science. Nor, moreover, is the doctrine of the Trinity, of which pagan (Neo-) platonism is far from being completely unaware and which, even among Christians, is more an incitement to "mystical" introspection or to "metaphysical" speculation than to the attentive observation of sensible, corporeal phenomena or to experiments with these.[2] There remains the dogma of the Incarnation, which is, furthermore, the only one of the great dogmas of Christian theology which is, from the point of view of historical reality, at once authentically and specifically Christian, that is, proper to all Christian thinking and to it alone.[3] If, therefore, Christianity is responsible for modern science, the Christian dogma of the Incarnation bears exclusive responsibility for this.

Now, if this is truly the case, history or chrono-logy are in perfect accord with "logic."

In fact, what is the Incarnation, if not the possibility that the eternal God can be really present in the temporal world where we ourselves live, without thereby los-

**See *Essai d'une histoire*, Tome III, pp. 526-527 for the attribution of Pseudo-Dionysius' works to Damascius.

ing any of His absolute perfection? But, if being present in the sensible world does not lessen that perfection, the reason is that this world itself is (or, has been or will be) perfect, at least in a certain measure (a measure, furthermore, that nothing prevents us from establishing with precision). If, as believing Christians affirm, a terrestrial (human) body can be "at the same time" the body of God and therefore a divine body and if, as the Greek savants thought, the divine (celestial) bodies accurately reflect eternal relations among mathematical entities, then nothing any longer stands in the way of searching for these relations in the world here below just as much as in the Heavens. Now, it is precisely to such a search that more and more Christians, beginning in the sixteenth century, passionately devoted themselves, followed afterwards by some Jews, Moslems, and pagans.[1]

But what exactly took place in the sixteenth century in the domain of science?

Kant was probably the first to recognize the decisive role played by the "Copernican Revolution" in the genesis of modern science. Now, what did Copernicus do besides projecting the Earth where we live, together with everything found there, into the Aristotelian Heaven? It has often been repeated that the Polish canon [Copernicus] displaced the earth from the privileged position assigned to it by pagan cosmology. People, however, have always forgotten to specify that this position was only "privileged" to the extent that it is thought to be the *lowest* thing in the world (at least in the figurative sense of these words).

For all the pagans, just as for all the pre-Copernican savants who claimed to be Christians, the Earth, with all that is found there, was truly a "here-below," in relation to which even the moon appears as something irremediably inaccessible and transcendent, as much in virtue of the supposed "ethereal" perfection of everything celestial as in virtue of the self-evident "heaviness" of everything earthly. Now, this pagan way of viewing things could not satisfy a man who, to be sure, wanted to do science, but only on condition of remaining a canon and, consequently, a Christian. However, it is not sufficient not to be satisfied with all the ancient versions in order to find a genuinely new way of seeing things. And if Copernicus succeeded where many other good Christians failed (without, to be sure, making any attempts to succeed), it is because he displayed, not imagination, but rather the enormous (intellectual) courage peculiar to geniuses alone.

However that may be, it is Copernicus who eliminated from science every trace of "docetist" paganism,*** by having the resuscitated body of Christ followed into Heaven by the totality of the terrestrial world where Jesus died, after being born there. Now, whatever this Heaven is for believing Christians, for all the savants of the era it was a "mathematical" or mathematizable Heaven. To project the Earth into such a Heaven is equivalent, therefore, to inviting these savants to undertake without delay the immense (but in no way infinite) task of working out mathematical physics. This is what Christian savants did in fact. And since they did it in a world already largely Christianized, they could do it without raising too strong an outcry against madness or even scandal.

Without a doubt, the mad Copernican projection of our earth into the Aristotelian heavens provoked in the latter a certain disorder which would have scandalized a classical pagan. But truly Christian savants could not take offense at this, nor did they. What was important for them was, in effect, entirely preserved, namely, the basic scientific identity of the earth and the heavens.

But, after a certain time, more exactly, after the time when a certain tendency to become an atheist rather than remain a Christian became manifest in the world (scientific and other), certain disquieting phenomena began to appear in the unified terro-celestial universe (on the high or low road towards becoming paradisical, without waiting for a reconfirmation of its divine character).

This is because the multi-dimensional "phase" space, where the mathematical laws of modern quantitative and quantum physics necessarily apply even in the smallest detail, resembles more and more the famous *Cosmos noetos* which certain pagans qualified as transcendent and called utopian, because it was a place which could not be situated, in relation to us, in any location. Whereas, on the other hand, the world where the births, the lives, and the deaths of men are situated in accessible and precise locations seems once again to be doomed to the most complete disorder, rule by pure chance.

The atheistic savants of our day have thus witnessed a sort of revenge of the ancient and pagan Plato . . .

But, if this has been the case, this would be another story altogether. A story, indeed, which would be all the more different inasmuch as the 'chance' brought once again into the picture seems, in comparison with chance as the Ancients understood it, to be mathematizable itself, or, indeed, divinized in the pagan sense of that term. It is thought to be perfectly measurable and even—*grosso modo*—precise, or in any case, eternal.

***"Docetism" is the name given by some of the early Church Fathers to the (heretical) doctrine that Christ's earthly and bodily career was merely an appearance or semblance (δόκησις).

1. There is still, it is true, the *Timaeus*. However, I have excellent reasons for believing (although I am probably the only one) that, as in all of Plato's dialogues, the theories explicitly developed in the *Timaeus* have nothing to do with the author's own ideas. In his dialogues, Plato exhibits fashionable theories which he judges erroneous and even pernicious, to which he is resolutely opposed, where this opposition generally takes the form of a more or less camouflaged persiflage, through which the theory being criticized is pushed to its absurd, even grotesque, consequences. (Cf., for example, *Timaeus* 91 d-e, where the famous "Darwinian" theory of the origin of species which Timaeus expounds has birds descend from...astronomers (of Eudoxus' type): "As far as the race of birds who have wings rather than hair, they arise, after a small [*sic*] modification, from men without wickedness, but light [légers], who are preoccupied with celestial phenomena, but believe, in

virtue of their simplicity, that the demonstrations one obtains of these by sight are the most solid.") In the dialogue which now concerns us, Timaeus is none other than Eudoxus (who was commonly called "Endoxus," by reason of his great celebrity), who irritated Plato enormously not only because he established a rival school in Athens (where the Platonic theory of ideas was completely deformed with a view to a "physical" application and where Plato himself was spitefully criticized for his lack of scientific cultivation), but also and especially because the 'scientism' of the Megarian-Eudoxian school so enormously impressed the best students of the Academy, Aristotle foremost among them. (Cf. *Philebus* 62 a-d, where we can see what Plato really thought of the sciences generally and of Eudoxian "mathematical physics" in particular.) However this may be, the ironically inflated tirade that ends the *Timaeus* and that Socrates listens to in silent reproof (*Timaeus* 92 c), shows clearly what Plato does not accept in the theory he is mocking. In and for this theory the world in which we live is a *sensible God (Theos aisthētos)*, a contradiction in terms for Plato, good pagan that he is, of the same kind as the pseudo-notion of the *squared circle.* Now, if Plato says that according to this theory the (sensible) world is divine, this is precisely because it claims to find in that world ratios, veritable mathematical entities. This is, therefore, the basic idea of mathematical physics, namely, the Eudoxian attempt to find in sensible (spatio-temporal) phenomena the precise ratios which subsist among *ideal* (eternal) mathematical entities—and this is, for Plato, at once a scandal and an act of folly. No doubt someone could say that Eudoxus himself was a pagan as well. But, in the first place, nothing is less certain, seeing that he could also have been an atheist. Secondly, what we know of his "mathematical physics" comes to us only through Plato's deliberately crack-brained mockery of it. Finally, as others have quite rightly remarked, we have to wait for the sixteenth century to see the first attempt to give scientific coherence to the ideas sketched in the *Timaeus* (if not by Plato—"Socrates," at least by Eudoxus—"Timaeus"). Until that time, although generally taken quite seriously (with, however, laudable exceptions, including the philosophical Emperor Julian), the *Timaeus* only had "mystical" or "magical" results (to say nothing of simple repetitions, whether ancient or modern, in which there is no attempt at understanding the text). Furthermore, Democritus himself could also have been an atheist. This does not stand in the way of the fact that in a Democritean world one can only find room for a *pagan* God, since God must necessarily be beyond, not only sensible phenomena (purely "subjective" phenomena), but beyond "atomic" (objective) reality as well.

2. Of course, the notion of the Christian trinity differs essentially from the Neo-platonic trinitarian notion (which is, in fact, purely Platonic in the sense that it can be traced back to Middle Platonism, which is itself only a dogmatic version of authentic Platonism) and the difference between these two notions has an enormous philosophical (or, if one wants, "metaphysical") bearing. However, this difference is uniquely due to the fact of the *Incarnation* of the Second Person. Now, it is evident that it is not the dogma of the Incarnation that has been deduced from the dogma of the Trinity. On the contrary, the Christian dogma of the Trinity is a derived dogma, in the sense that Christianity radically transformed the pagan trinitarian notion so as to make it compatible with the fact of the Incarnation (as well as the fact of the "gift" of the Holy Spirit, itself posterior to the Incarnation and derivative from it).
3. What the Incarnation is for the Christian has nothing to do with the self-styled "incarnations" which pagan myths or biblical tales have in view: *to become* and *to be* a man is totally different from *taking on* a human (or other) form (or appearance). Saint Augustine saw this perfectly well and showed it clearly to the Christians (see, for example, *De Trinitate* II, vii, 12 and IV, xxi, 31), while, on the other hand, the adepts of Judaism never had any doubt about it.
4. Without a doubt the scientific consequences of the dogma of the Incarnation were only drawn bit by bit (without, to be sure, any appreciable help from the side of the Church). For example, scientific Paganism was able to preserve itself for so long a time in the Christian world thanks to the preservation of the "Democritean" distinction between "secondary" and "primary" qualities, which seemed an anodyne from the theological point of view. But, the assertion that the color of Jesus' hair or the sound of his voice are only "subjective" phenomena in fact amounts to the same theological "Docetism" that the Church rigorously and effectively combatted as an obvious result of Paganism. It is no wonder, then, that Christian science ended up by putting a stop to this lamentable affair so that the responsible and competent ecclesiastical authorities did not have to intervene, at least not explicitly. Today, far from abstracting from "secondary qualities" on the model of Democritus, who thought them despicable, mathematical physics treats them with profound respect and seeks to mathematize them; they have the same status as those entities pagan savants judged to be noble, or even divine.