

RATIONALISM IN AN AGE OF REASON

JOSÉ PEDRO SEGUNDO

*Department of Anatomy and Brain Research Institute
University of California, Los Angeles
Los Angeles CA 90024, U.S.A.*

(Received November 10, 1982)

Abstract

This presentation expresses the opinion that, although a strong affirmation of Rationalism lies in the very essence of the neural sciences (and of all the other sciences), and provides them with their major force, an attitude of unquestioning and untroubled trust in Reason is unwarranted and much too prevalent. Caveats as to its potential issue from the facts that it is in human nature to rationalize rather than to reason (the Neurosciences in particular presenting opportunities for it), that deductive systematizations have unavoidable shortcomings, and that ultimately Reason cannot prove or reject itself without incurring in either a circular argument or a contradiction. At a time when the Neurosciences' domain becomes broader in terms of both understanding and manipulating, a more modest and cautious Rationalism, i.e., a critical one (Popper, 1965) that recognizes its limitations, becomes more and more necessary.

Scientific thinking stands on the premise of an outside world that is objective in the sense of existing without our cooperation; it is propelled jointly by the conviction that such a world is knowable and explainable through largely, if not exclusively, mechanistic laws of causality and determinism, by a distrustful casting of doubts upon existing views, and ultimately by the strong affirmation of Rationalism (Hessen, 1939). At the same time, most references to the observer are essentially ignored and metaphysical or ethical issues left aside. The success and permanence of Science are due to the empirical and unforeseeable fact that its dialectic allows coincidences between hypothesis and predictions on the one hand, and experimental results on the other; it is because of this that the scientific revolution occurred, continues, and shows no signs of faltering.

Numerous issues can be discussed within this context, of course. One, for example, is the scope of what Neurobiology and the Neurosciences teach us, and another the extent to which a method based on Reason is to be trusted. "Reason" is used here in the modern sense referring to the faculty of thinking in logical ways, either inductively from experimental observations, or deductively from explicit postulates, and of comprehending in an orderly manner. The degree to which individuals, be they neuroscientists or not, are concerned by these matters varies from not at all to a lot, being largely a matter of curiosity, pragmatism, and personal inclination. The following concentrates upon the last issue since it is a prerequisite to any other, and expresses views that, although not those of a philosopher, may have some interest as from one who has been active for some time in the Neurosciences.

Knowing appears always to involve regarding an object through the framework of some principle or another (Ortega y Gasset, 1971); this would hold even in everyday

life which usually adjusts itself to certain norms (although they remain remote and close to our mental horizon) and that rarely becomes an anarchic wandering. In the Sciences, principles become explicit and deliberate, and much has been said about the investigator's use of his reasoning powers, his methods, statistical criteria, modeling procedures, etc. and about their rational justifications (e.g., Fisher, 1966, 1973). It is my belief that it is not worthless to add — really to reiterate (e.g., Hayek, 1967; Popper, 1965) — some critical comments addressed largely to those who, maybe naïvely and inadvertently, would remain at, or be carried away to, simplistic and uncritical attitudes of exaggerated trust in a cartesian Rationalism, self-sufficient and cosmic. Such attitudes are perhaps more prevalent than they should be within the scientific community; when extreme — and particularly if associated with a certain petulance — they imply an irresponsible candor and gullibility that do not marry happily with the curious and critical thinking of the scientific method.

Two fronts, as it were, where Rationalism may be vulnerable shall be covered, one on a more practical flank, the other on a more formal one. A practical aspect inherent in the neuroscientist's work is the fact that subject and object are inseparable in the dynamics of any knowledge, even from the viewpoint that it is not the Universe that is given immediately in its corporeal self, but its mediate representations through senses that cannot be deemed completely trustworthy (e.g., Mountcastle, 1975). The neuroscientist certainly does not differ in this from other scientists, but more in his topic than in any other is the mixture of the Universe and his own being so close.

It is relevant, moreover, to reiterate that motivation can be just as treacherously subconscious and ignored as manifestly conscious and deliberate. Indeed, only too often decisions are not made, and conclusions not reached, exclusively as one would believe — or would like to believe — at the intellectual level of a detached balance of proofs and counter-proofs, but at other levels, where objectivity is diluted by the winds and the mists of feelings and passions in a complex interplay of reason and non-reason, where one rationalizes rather than reasons, where Reason ceases to be the dispassionate judge to become a biased insidious advocate. Circumstances allow certain approaches to be bent with impunity, in practice even deceitful. Opportunities arise, for example, in the initial experimental design and in the exercising of certain prerogatives such as deciding which data are sufficiently outlandish and preposterous that they must be judged artifactual or at least untrustworthy, and thus ignored, or selecting references for an unavoidably restricted bibliography. It is even possible to distort legitimate conclusions by expressing them in a way that does not seem different but is in fact unjustified: for example, the positive finding that some model matches reality well means simply that it is one of several more or less likely ones, and does not justify concluding that its assumptions are necessarily established. The fact that Life's center of gravity sways unceasingly under the push-pulls of intellect, feelings and volitions suggests, then, that as of necessity Physics was revolutionized when its descriptions were made compatible with the size, weight and means of an observer of our race (who cannot, for instance, ride upon a photon), so must all Science "humanize" itself, taking heed of the observer himself, marginalized so far as irrelevant in a mistaken and misleading attitude of false modesty and detached austerity.

On the more formal front, one aspect of the question is that the neural sciences, as others, are plagued by postulates. Scientific language, for one, depends on an everyday language that implies a structure, a set of rules, a reliance on everyday life that, regardless of their origin and of whether explicit or not, bias any interpretation. Conjectural is the conviction that the Universe has a rational structure with laws that can be detected, as is the notion that they can be discovered experimentally if certain rules are applied. And, even when such laws are enunciated and found successful practically, one can well ask whether this lawful scaffolding reflects that of the object being analyzed, or that of the subject's own intellect, an *a priori* form into which the experimental facts are fitted; and if it reveals both, which are their relative contributions?

Reason itself has shortcomings. On one side, logicians have pointed out that the only way to establish the consistency of a deductive system is to accept principles whose own solidity is as doubtful as that of the first (Nagel and Newman, 1968; Quine, 1968); they note, too, that there can be no exhaustive deductive organization even of elementary arithmetic (let alone one of classical mathematics), since any attempt must of necessity be either incomplete and fall short of proving certain truths, or untrustworthy and demonstrate falsehoods. On the other side, the essentially subjective nature of the ultimate decisions attending induction is apparent in the following quotations: "It is open to the experimenter to be more or less exacting in respect to the smallness of the probability he would require before he would be willing to admit that his observations have demonstrated a positive result" (Fisher, 1966, p. 13); "Though recognizable as a psychological condition of reluctance, or resistance to the acceptance of a proposition, the feeling induced by a test of significance has an objective basis in that the probability statement on which it is based is a fact communicable to, and verifiable by, other rational minds" (Fisher, 1973, p. 46). The above, which may jar intuitive preconditions, has in truth great and manifold implications, forcing a re-evaluation of mathematics, of logic, of any theory of knowledge, and ultimately of any knowledge.

It would seem, furthermore, that logically an overconfident Rationalism is simply untenable, for it cannot be based upon either an argument or an experimental demonstration. The identification with it that all of us exhibit seems to take off not from an intellectual decision, as we would like, but rather from an irrational volition, from what is a veritable act of faith in Reason. Indeed, it is not possible in any field to have a way of thinking that endorses itself; in order to demonstrate something, something else must be accepted, and one must believe in a third something that provides the thread that leads from the one to the other. Hence, it is indispensable to accept certain postulates. Whoever advocates Rationalism and adduces reasons in its favor in fact enters the vicious circle of Rationalism supporting itself, revealing only belief based upon blind faith; whoever takes the opposite tack and presumes strong arguments against it, incurs the contradiction of using Rationalism to torpedo it, revealing only disbelief based upon blind faith. Either attitude, for or against, implies a primal and protorational decision. The takeoff of what we call scientific knowledge ultimately is but appealing conjecture with no more support than opinions referred to (sometimes with a pejorative aura) as mysticisms, projections, alienations, interested

comforts, substitutions for the father-image, and judged as fallacies, at times more or less reasonable, at times more or less farcical.

To finish, it must first be recognized that this presentation justifiably could be called “misleading” or even “perfidious” if, having moved along a reasoned argument — well-concocted and convincing or not — it were to wind up with a flat rejection of all Rationalism. It will end, then, by coming out for Rationalism, but — this must be understood — it is for one that starts (or perhaps ends?) by admitting that saying “I am a Rationalist” simply is the expression of a creed no more, no less than are the “I am a Christian” of some, the “I am a Marxist” of others, and even the “I am a Melibean” of Calisto, sick with love for his Melibea (Rojas, 1923). It is, then, a critical Rationalism, as one of its major contemporary proponents (Popper, 1965) calls it. One that knows that remaining true to its own self means demanding of any assertion the seal of approval from its own tribunal, as well as reserving for itself the last word; one that knows that, if it complies with its precepts, it can boast without undue petulance of being a sterner critic of the game-rules it accepts, a more stubborn guarantor of consistency, and a more severe judge of its nature than any other known approach. But at the same time and ultimately, it is a Rationalism that cannot deny without gainsaying its essence that it is not immune to the flatteries, prods and nudges of intruding biases, that extant norms are conditioned by suppositions, that its mathematizations cannot be complete, omniscient or infallible, and above all, that it is accepted on an instinctive decision by an act of faith.

These lines may be considered a naughty disparagement of Reason as a criterion, an unwarranted, out-of-tune assault upon the essence of our trade. Such interpretations would not be quite fair, however, because the efficacy of Reason must be served better by an unceasing inquisition into its shortcomings than by a blind and untroubled veneration of its sacrosanctity. In the social sciences, according to Hayek (1967), a short-sighted Rationalism has “. . . wrought unmeasurable harm, whatever its great achievements in the sphere of technology may have been . . .”. There is danger of this happening with the Neurosciences, particularly now, when they stroke more and more the surface of issues with deep humanistic connotations, probing into them with hopes of great achievement, perhaps more justified in terms of spectacular interferences than in those of illuminated understanding, for it is in this terrain where Man, though exhibiting an intense need for certainty since appearing as the curious animal par excellence, has failed once and again in this quest and often sung the blues of his frustrations.

It is in a way understandable that naïve or “constructivist” (Hayek, 1967) Rationalism exerts a specially widespread appeal, since it caters to needs inherent in the complex and sometimes contradictory human make-up, needs for certainty and all-encompassing, grandiose schemes, as well as for the reassuring though viscous support of a tightly knit group. It is this other kind, however, that though meeker and less bewitching, has provided the major thrust to progress in the field of Science, and it can be mentioned as an aside, in the touchier ones of Politics, Ethics and Religion. The Neurosciences, if they are to deserve to be called true sciences, certainly cannot turn their backs on the trust in human Reason that launched them and keeps them afloat. It is even probable that being just rational would suffice for remaining useful

technically in Industry and Medicine; however, only if in addition the Neurosciences temper dogmatic temerity by a circumspect self-analysis, only if rational and critical, can they contribute as instruments of knowledge and judicious guides to compose the images of Man, his society and his culture.

References

- Fisher, R. A. (1966). *The Design of Experiments*. Hafner Publishing Co., New York.
- Fisher R. A. (1973). *Statistical Methods and Scientific Inference*. Hafner Publishing Co., New York.
- Hayek, F. A. (1967). *Studies in Philosophy, Politics and Economics*. The University of Chicago Press, Chicago.
- Hessen, J. (1939). *Teoría del Conocimiento*. Editorial Losada, Buenos Aires.
- Mountcastle, V. B. (1975). The view from within. Pathways to the study of perception. *Johns Hopkins Med. J.* 136: 109–131.
- Nagel, E. and Newman, J. R. (1968). Gödel's proof. In: *Mathematics in the Modern World. Readings from Scientific American*, pp. 221–231. W. H. Freeman and Co., San Francisco.
- Ortega y Gasset J. (1971) *The Idea of the Principle in Leibnitz and the Evolution of Deductive Theory*. Norton, New York.
- Popper, K. R. (1965) *Conjectures and Refutations. The Growth of Scientific Knowledge*. Basic Books Inc., New York.
- Quine, W. V. (1968). The foundations of mathematics. In: *Mathematics in the Modern World. Readings from Scientific American*, pp. 191–199. W. H. Freeman, San Francisco.
- Rojas, F. de (1923). *The Tragi-Comedy of Calisto and Melibea*. Dutton, New York.