Criticism: Destructive and Constructive

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Résumé — Chez les scientifiques, la plupart des critiques sont constructives, alors qu'elles sont destructrices chez les humanistes. En effet, les scientifiques font circuler leurs brouillons entre collègues et étudiants, dans l'espoir de recueillir leurs commentaires et suggestions avant de soumettre leurs travaux à la publication. En revanche, les philosophes et les penseurs politiques attaquent leurs rivaux à coup d'arguments ad hominem et d'insultes. La raison de cette différence est que les scientifiques recherchent la vérité, alors que la plupart des humanistes se battent pour des causes plus ou moins nobles, allant de la promotion de leur propre programme à la participation à des croisades pour ou contre la rationalité, le réalisme, la justice ou autre.

Abstract — In the scientific communities most criticisms are constructive, while they are destructive in the humanistic circles. Indeed, scientists circulate their drafts among colleagues and students, hoping to elicit their comments and suggestions before submitting their work to publication. In contrast, philosophers and political thinkers attack their rivals, without sparing arguments ad hominem or even insults. The reason for this difference is that scientists are after the truth, whereas most humanists fight for more or less noble causes, from swelling their own curricula to joining crusades for or against rationality, realism, justice, or what have you.

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The reason for this difference is that scientists are after the truth, whereas most humanists fight for more or less noble causes, from swelling their own curricula to joining crusades for or against rationality, realism, justice, or what have you. An extreme case is Einstein's criticism of the subjectivist philosophy of Ernst Mach, whose work in experimental physics Einstein respected and lauded. Another exemplar is Lenin's criticism of the idealist physicists of his time, whom he called "lackeys of the bourgeoisie". He felt no respect for his targets because he did not understand their contributions to science.

Around 1950 I regarded myself as a student of Marxism and was ready to face the establishment's philosophy of science, which was operationist—in summary, "time is what clocks measure". I was duly provoked by the talk that Leo Rosenfeld—Bohr's lapdog—gave at the Sao Paulo Institute of Theoretical Physics in 1951, where I was spending a semester as David Bohm's postdoc student. Rosenfeld was an easy target, for he went as far as to claim that locomotives worked because their machinists shared the principles of thermodynamics. I wrote a critical paper that the British Journal for the Philosophy of Science published on the recommendation of Karl Popper[2].

However, I was dissatisfied with the job of gravediggers: I wished to grapple with philosophical problems. To fulfill this task I bought an elegant notebook with straw covers, to be filled exclusively with my thoughts on philosophical problems. I waited in vain for inspiration. The philosophical works of the classics of Marxism had prepared me for destructive criticism, not for working on fresh problems. I had not realized yet that philosophical schools are essentially barren.

Inspiration struck only in about 1966, while teaching the two relativities at the University of Delaware. There I axiomatized both theories and advised a couple of students, who wrote a paper each. Shortly thereafter I conceived of the research project that would keep me busy during the next

[2] « Strife about Complementarity (I) », 1955 and « Strife about Complementarity (II) », 1955.

few years. This was to construct an objective alternative to the standard or Copenhagen interpretation of quantum mechanics, a theory that I had taught in both my native Argentina and in the USA.

The completion of this task led me to propose an enrichment of conventional axiomatics, consisting in accompanying every mathematical postulate with a semantical assumption. For example, an axiom of the form "X is a Hermitian operator" would be paired with "X represents the energy of an arbitrary quanton (quantum-mechanical entity)." I call dual axiomatics this enriched version of conventional axiomatics, and claim that it avoids philosophical grafts and clarifies a number of obscure points in the ordinary or heuristic formulations. For example, it becomes clear that all the references to observers in the theorems are illegitimate because they do not occur in the axioms, and that the geometric coordinates individuate points in space, not particle positions.

My student and coworker Andrés Kálnay, as well as the Nobel Prize winner Willis Lamb adhered to my reconstruction of quantum mechanics. Lamb wished me to join him in a research project, but he caught me when I was immersed in the philosophy of social science. My project in quantum theory was continued by Héctor Vucetich and his students at my alma mater, the University of La Plata, in particular Gustavo Romero and Santiago Pérez Bergliaffa. In short, I realized that the most effective criticism is the one accompanied by a suitable substitute. The end result of that decade of work are my books Foundations of Physics and Scientific Research, both published by Springer in 1967[3].

My next essays in constructive criticism were my works in the philosophy of mind[4] and on political philosophy[5]. I criticized psychoneural dualism as a barren pseudoscience, and parliamentary democracy as a partial and therefore ineffective political regime. I tried to show that cognitive neuroscience delivers all that had been attained by brainless psychology and then some. I also argued that the shortcomings of parliamentary democracy are corrected by expanding it into integral democracy, not by rejecting it the way the Marxist-Leninists had done.

[3] Foundations of Physics, 1967, Scientific Research I, 1967, Scientific Research II, 1967.

[4] The Mind-Body Problem, 1980.

[5] Political Philosophy, 2009.

My brief passage in 1951 through a Peronist jail for political dissidents had persuaded me that civil liberties, though insufficient, are necessary for an acceptable quality of life. Integral democracy seems to include the merits of both political democracy and genuine socialism. But I still have no clue as to how to effect a peaceful transition from political to integral democracy.

In sum, destructive criticism is occasionally necessary but it does not beget new ideas and it satisfies our hunting instinct but not our need for creative and peaceful cooperation. The progress of science, technology and the humanities calls for invention and constructive criticism, that is, criticism in the service of progress, not of political power.

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