Natural Epistemology♦•

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ABSTRACT

I now intend to return to Husserl's argument against psychologism in logic, aiming to frame it within the broader antinaturalistic controversy and see how recent proposals of a natural (or naturalized) epistemology could affect it.

Again, it is convenient to start from Brentano. We have already seen how his ideal of a rigorous science held mathematical physics as a model. Impervious to post-Kantian idealism, Brentano's conception remained essentially naturalistic. And this was not to be seen as a threat to philosophy. On the contrary, in the success of science and its methods, Brentano saw the opportunity to free philosophy from a centuries-old state of uncertainty: the philosophers should just have adopted the same methods[1]. Hence Husserl lumped him in with the psycholo-

♦ The following is a slightly revised translation of the fourth paragraph of the second chapter of A. Peruzzi, *Noema. Mente e logica attraverso Husserl* (*Noema. Mind and Logic through Husserl*), Franco Angeli, Milano 1988. The chapter extends from p. 79 to p. 88. These pages set up a problem and discuss some possible solutions. The problem is to establish a natural yet non-reductionist phenomenological epistemology. Subsequent chapters explore this path in depth, discussing its implications concerning a theory of reason that is as compatible with the methods and domains of the natural sciences as it can hold firm to the richness of the idealities desribed by phenomenology. Peruzzi's reading of Husserl is still fertile with solutions for a phenomenological epistemology aiming to free itself from the mainstream meanings of "nature" and "reason". This translation benefited from the advice of the Author, to whom the Translator wishes to express his sincere gratitude [n. d. T.].

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[1] In time, however, some doubts about naturalism began to surface in Brentano (for example, in the 1893 essay *Über die Zukunft der Philosophie*). The confusion between norms and natural laws now appeared to him as harmful in logic as in any other axiology: space had to be made for a rationality that was not only inductive but which, to be descriptive of the a priori, did not accept being less scientific.

gists. However, one of the underlying issues addressed by Husserl's radical critique of psychologism in the *Prolegomena* takes root in Brentano's problem. How can an "ideal" law be instantiated by a natural process, subject to physical laws, without being reducible to it? Since we already have framed Husserl's position against psychologism in a broader context, which brought us to discuss the mind's place in the universe, let us now consider Husserl's central argument from a closer point of view. *Logico-mathematical "laws" are necessary a priori truths; human existence and the structure of the human mind are contingent phenomena of nature; thus, it is impossible to ground the necessity of those laws by describing these phenomena*[2].

The argument's nucleus has a long history. One could trace its basic design back to Epicurus: «Someone who claims that everything happens by necessity cannot object when someone else claims that this is not the case. For they too claim this by necessity». J. B. S. Haldane proposed it again in 1932: «If materialism is true, it seems to me that we cannot know that it is true. If my opinions are the result of the chemical processes going on in my brain, they are determined by the laws of chemistry, not those of logic». Aside from the fact that Haldane would later drop this argument, the question is nowhere near resolved. Given its importance for our discussion, we must reconsider it.

As the references to Epicurus and Haldane show, one could use the argument for many aims: against determinism or materialism, always to come at a reductio ad absurdum. These are theories that, if supposed to be true, end up being false.

Recently, the problem has come to the fore again thanks to computer science's development: how can we say that a computer works "badly" or has a "fault" if, as a physical object, it necessarily works according to the laws of physics? And if the control standards are just surveys on how our mind factually works, why should this not apply to computers too? In the case of a computer, attributing correct or incorrect functioning to it depends on the criteria of an independent system (ourselves). However, when we examine our inferential procedures, we realize that "correctness" is not always *external* to a system. Or should we say that correctness criteria are parochial delusions? Low species-specific ideology? Simple instruments that, based on adaptive conventions,

[2] Also subject to this refutation is the particular naturalization of values and norms that Historicism promoted.

make a virtue out of necessity? In other words, do we accept logical and mathematical principles because they are valid, or are they valid because we accept them as such?

On the one hand, we accept something as valid for many different reasons. On the other hand, we can also not consciously indicate why we follow particular formal schemes – some of which are genetically selected, others culturally inherited. However, they are no granitic blocks of inviolable Absolutes. The human mind can use them *one against the other*. The ending point of this expression of freedom is still highly hypothetical. However, this *struggle of mind*[3] for truth appears to transcend the simple interlocking of mechanical elements, the growth of a plant, or the feedback of a thermostat. Naturalism seems incompatible with the claim to *rationality* proper to our arguments, explanations, and theories. And, after *Logical Investigations*, it is no coincidence that Husserl decisively reiterated the impossibility of any naturalistic theory of consciousness in *Philosophy as a rigorous science*.

The problem is that this thinking pattern no longer appears as convincing as it once did.

If things were like that, phenomenology should put itself outside of the world or become a hyper-abstract combinatorics of formal consciousness and knowledge functions. Its instantiation, here and now, *just like* this and not otherwise, would be inexplicable. The problem of how a presupposition-free phenomenology could be possible would arise again. Does not the turning point brought about by Heidegger, with the priority given to the dimension of the *Dasein*, find here its deep justification? However, it is a "cure" worse than the disease. As is the case for the referentialism of those who follow the causal theory associated with the names of Kripke and Putnam, flattening the "constitutive" issue on the existential level deprives phenomenological investigation of the distance necessary for any rational framing of experience. Yet does that same distance not contradict the need for an internal explanation of rationality? It does not. Help in clarifying the terms of the problem already comes from Baden Neo-Kantianism: since values are not generally instantiated in actual experience, Windelband spoke of their necessity as a *teleological* one. Hence the validity of certain principles and norms must be admitted if one must meet specific aims. This is why he reaffirmed the underlying reasons for criticism against any epis-

[3] English in the original text [n. d. T.].

temological naturalization. Axioms and rules are seen, on the one hand, as historic-psychological formations whose validity is inexplicable without their genesis, on the other hand, as indispensable presuppositions to the actualization of specific aims (truth, good, etc.). This teleological necessity should not be confused with a prologue to conventionalism. There is still a gap between levels (more subtle than long believed, but appreciable). The abstract transcendental level positions itself, as a presupposition for the instantiation of values as aims, above the level of conventions as concrete mechanisms of any specific theorization. The gap between levels does not prevent, however, the *changing* of "presuppositions" – about this, the lucidity of Clarence I. Lewis still has a lot to teach us.

Here, I would especially question the idea that the objections to "classical" materialism and psychologism should hold forever against any possible form of naturalism. After all, the possibility of any science entails an evolution of the universe and not just any evolution. Maybe, as Jacques Monod says, we were genuinely unforeseeable before our appearance, but we were indeed possible; and if we were no more possible than other biological systems that did *not* instantiate, we were not possible in the exact extent of any other thing, once one takes into account the selective action of the *Earth*'s environment (even with its geological and climactic changes)[4]. What does this mean? It means that our critical thinking ability, logic, and rationality were elaborated under pressure exerted by specific problems posed to man by the environment (including the social one and the internal, self-exploring one). One cannot value the results of this ability independently from those problems. Cantor's paradise presupposes Dante's inferno. The fabric of the world is far more intricate than the critics of any naturalistic fallacy let us think, with their ontological or categorical moats. I do not see how intentionality can be understood outside human biology. This in no way preludes to yet another Oedipal reductionism: to misunderstand the emergence of "global" characteristics resulting from an increase in structural complexity is a mistake that an effective naturalistic approach *must not* make. Mental phenomena (including the ideal normative character of logical schemes) can be defined in more "elementary" terms only at the cost of enriching the substratum with lots and lots of qualities, such that one could speak no more of reduction but rather of translation. The peculiarities of the interaction between

[4] And according to Searle, *meanings* themselves can be conceived as the development of more primitive forms of intentionality on the scale of evolution (i.e., non-linguistic forms).

systems – and those of human reason are no exception – must be duly placed in a new worldview. Thus, if we use Neurath's metaphor about scientific knowledge as a ship that we repair with its parts while we continue to sail, the refusal of transcendental analysis – Tragesser observed – is equivalent to the impossibility of accessing the *project* of the same ship. If not, I add, to the hypothesis that this project does not *exist*.

From this perspective, the two most important contributions came from Piaget and Lorenz. Only later there were Popper's and Quine's proposals concerning the philosophy of science and Chomsky's proposal concerning language[5].

Lorenz suggested that the cognitive processes and the properties attributed to the object of knowledge must be analyzed together. To this end, the approach already outlined in Lorenz (1941) generally agrees with Donald Campbell's evolutionary epistemology on the relevance of studying the phylogenetic evolution of the perceptual apparatus – what Lorenz calls "world-image apparatus". This apparatus is for the individual an a priori in that it precedes his experience and indeed makes it possible. However, similar to what Georg Simmel had said about the historical variability of categories, Lorenz observes that the function of an a priori is historically determined. There can be different solutions (at most, as many as there are species) that we can compare because they all refer to the same reality (or vice versa, we can talk about reality as long as this comparison is successful). Hence Lorenz adopted the term "hypothetical realism" for reference to the type of philosophy that goes with this theory of knowledge intended as a *science of experiential apparati* (no more just human ones). The data concerning our world-image-apparatus and what it is an image of would support Lorenz's "hypothetical idealism". The mirror – that the realist does not see and the idealist expands to the point of covering what is mirrored – has a non-reflecting face, the physiological apparatus, no less real than the world it reflects, see Lorenz (1973) 37 and 46. The loss in degrees of freedom of human cognitive performance – a loss due to the adoption of logical-mathematical

[5] There are, of course, many more proposals along these lines. I have merely mentioned those of greatest resonance in the contemporary debate. For the Chomskian project, see Peruzzi (1982). Quine states that epistemology is only "science applied to itself" but then ends up identifying it with a chapter of psychology – the problem is *which* psychology...

constraints on reasoning – then testifies to the robustness of the adaptation made at such a price[6].

According to Lorenz, the a priori is the function of an organ (the central nervous system), and therefore we can understand it by raising the questions typical of the study of the organic world (what it is for, where it comes from, and why) in a Darwinian framework. On the other hand, Kant, to whom Lorenz claims to be indebted, had precisely overlooked the organic character of a priori structures. This character is associated with the question of the 'significance" of these structures, primarily for preserving the species (but as is typical of other biological structures, their 'significance" changes with evolution). Furthermore, about the "keyboard", the stock or reserve of categorical forms, Lorenz (1941) 110 observes that «the forms of intuition and categories do not represent the spirit for us, but mechanisms which it uses and which on the one hand support and on the other hand stiffen innate structures». The modalities of the a priori are not specifically human. Such is instead the impulse not to allow oneself to be reduced to a kind of rail vehicle but to preserve, as one's permanent condition, the youthful openness to the world and to approach reality in a relationship of constant, reciprocal confrontation. The greater rigidity of the a priori, as it can mold itself over time, is thus the result of phylogenesis. However, these are always more or less open instruction programs[7]. The confrontation with experience decides. The *epoché* is functional: we are able, when necessary, to suspend and modify, however locally, in the restricted domain of some sophisticated theory, our most profound inheritance, necessary for the acquisition of experience. Thus, we can renounce *each* of the schemes provided to us *by exploiting other schemes*. And with that, Neurath's ship, which became a fleet with

[6] Then the mental constraints themselves, that are imposed by the demands of tuning the internal structure to the empirical data, can be said to be as much subjective as objective (they are not matters of choice but neither are they independent of the mind). In this sense, the phenomenological a priori presents itself as monistic. Similarly, a symmetry principle in physics is as much metatheoretical as it is directly ontological. Likewise, the «anthropic principle» (Brandon Carter) in cosmology has a dual valence: physical and meta-physical.

[7] This is functional to an efficient *balance* between a priori and a posteriori: «A general and absolute plasticity of all behavioral modules would require an infinite amount of both this information and these learning *apparati*, which would obviously be meaningless» Lorenz (1973) 171. An objection has been raised to evolutionist epistemology (from Boltzmann onwards): Darwin's is a theory like the others and depends holistically on them, so it cannot ground the truth or progress of the sciences. This is a superficial objection because, *at the very least*, it can apply indifferently to everything and exemplifies incorrect reasoning (like saying that a grammar of Italian written in Italian is meaningless). Besides, not every natural epistemology is Darwinist.

Putnam, also acquires the standard equipment for a naval battle when not for a mutiny.

The problematic relationship between cognitive science and epistemology can ultimately be traced back to a duality of emphasis in both disciplines: the descriptive and the foundational-axiological one[8]. Notably, this occurs in the historical-critical method of Neo-Kantian ascendancy and Piaget's genetic epistemology. Piaget's ambitious attempt aimed also at understanding "categories", through the mosaic of symmetries that the history of science and psychogenesis would manifest. I do not believe that these symmetries have been sufficiently substantiated. However, this objection does not prevent us from appreciating Piaget's recovery of an a priori concept purged of absolutist assumptions or "hard" biological reductions:

1. a priori structures develop according to particular dynamics by states of equilibrium;

2. they are relative to a given set of cognitive schemes that, on an ontogenetic scale, have been selected as a function of solving a broad spectrum of problems and in compliance with predefined parameters (time at disposal, amount of information available, etc.).

For Piaget, categorical structures are neither entirely innate nor entirely derived from the environment, and their eventual necessity is always something achieved; they are not "given", at the outset, in the mind or the external world, they are constituted through the long and complex interaction between subject

[8] We can then re-examine Popper's (1972) Ch. 3 on an «Epistemology without a Knowing Subject», namely: 1) the irrelevance of the classical theory of knowledge, subjectively oriented, to the study of scientific knowledge, objectified in problems and theories, which form World 3; 2) the decisive importance of this study for epistemology; 3) the explanatory power of such an objectivist epistemology about subjective thought processes, whereas the reverse would not apply. Clearly, a judgement on Popper's arguments in support of these three theses involves methodological choices and wide-ranging consequences (e.g. on the subjectivist theory of probability and the role of the observer in quantum mechanics). Instead, the whole "Husserlian" framework of my analysis aims at rejecting thesis 1 and the negative part of thesis 3. Here I will limit myself to saying that a) the negation of 1 in no way prevents the awareness of a distinction between two categories of problems (similarly to the production/product pair), b) an evaluation of the priority of one type of study over another cannot be formulated in general but always with a view to the solution of specific problems, c) the force of the positive part of 3 is appreciable only if it takes the form of a mathematization of cognitive processes – otherwise, how could one, by studying products, learn anything precise about the activity of production? – and d) the "subjective" epistemology is itself a source of scientific problems.

and object. Thus a dynamic constructiveness of the a priori emerges, whose interest is still unjustly underestimated by many epistemologists. Such constructiveness emphasizes cognitive systems as operators of transformations. Objectivity becomes the result of progressive decentralizations of the subject (in the form, for example, of conservation principles).

One of the elements on which Lorenz and Piaget differ lies in the fact that, for Lorenz, the a priori is what is biologically hereditary, hence innate. In contrast, for Piaget (1970) 66 «cognitive structures become necessary, but at the end of their development without being so from the beginning, and do not involve prior programming». Piaget believes that the activation of any cognitive structure is always due to experience. However, on this, and for the same reason I criticized Chomsky in Peruzzi (1983), one can also disagree because there are mechanisms that are regulated from within in the course of the morphogenesis of the mind. At the same time, as Lorenz observes, one of the cortical system's primary functions is inhibiting endogenous behavior. Piaget also objected to Lorenz that it was impossible to account for necessity (the feature appealed to when one imposes logical-mathematical structures on oneself) because a priori forms are for him only «working hypotheses», however hereditary (innate), and this would lead Lorenz back into a conventionalist contingentism. Instead, logical-mathematical constructions consist neither of inventions nor of discoveries: they are progressive syntheses that transcend basic biological structures in a non-arbitrary manner. However, does this also show their necessity? As fruitful as the Piagetian approach is, once the importance of self-regulation has been established, the problem that Piaget leaves unsolved is why, with all these non-inborn schemes, one almost fatally arrives at the same result. Whereas, if the regulating principles are endogenous (which does not mean innate), it is easier to understand why the effects should not vary much more than we observe. All the more so if we admit with Piaget that self-regulations have an intrinsic tendency towards equilibrium. After all, even the internal structures of the mind constitute an environment that requires its "ecology". Piaget rightly wants to deny the pre-formed character of specific structures (e.g., logical-linguistic), but this does not exclude that a kind of clock marking the times and ways in which those structures can be activated is part of the genetic baggage. It is precisely this clock that is innate – and so, the contrast with Lorenz is mitigated too.

Genetic inheritance does not solve all problems at issue. Rather, it shifts some of them. However, it does not just shift them: the dynamics of the interactions between the cognitive organism and the environment come into a

conceptual framework quite different from the schemes of the traditional theory of knowledge. The status of abstract entities must also be coherently framed within the architecture of psychogenesis, avoiding the static nature of Gestalt. In particular, logic results from operating on the same operations activated in earlier stages of the child's development: but it thus becomes part of the same hierarchy of structures: it is neither a parasitic tail nor a self-invited guest. The teleonomic conception of values is then specified in the thesis that rationality is constructed as a system of control schemes over other integrated operational schemes. In contrast, intentionality is a feature of a system that manifests itself with (a) the ability of model-building related to the epoché and (b) self-reference: the system must be sufficiently complex to be able to "turn on its head". There is nothing to distinguish natural intelligence from artificial intelligence because both exploit the energy and structure of the physical world, both remaining immersed in it[9].

This view of the role of subjectivity in nature also serves to provide a solution to the much-debated problem of the "unreasonable" effectiveness of mathematics in its application to reality. For this purpose, neither Lorenz's other side of the mirror nor Piaget's sharp hierarchy of abstractions will suffice. However, they point in the right direction: that of a universe that self-selects the property of being observed and represented, although it does not *determine* the manner: after all, it is our business to fish out the appropriate mosaic tiles from the stock that is accessible to us.

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[9] My proposal is therefore antithetical to that, inspired by Merleau-Ponty, of Hubert Dreyfus: I do not see in intentionality any watershed between minds and machines, and Gödel's Theorem is not its guardian. Phenomenology is not that «ball of fluff» of which Edward Feigenbaum speaks. Moreover, Winograd and Flores' (1986) use of hermeneutics is in no way binding, even though I share their criticism of the "rationalist" tradition concerning artificial intelligence: failing to consider the human capacity to interpret meaning and to use language as part of action. The objective roots of meaning and logic act here as the glue between functionalism and epistemological naturalism, avoiding the essential dichotomy between *software* and *wetware* advocated by Dreyfus and Searle.

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