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Paul K. Feyerabend 

Knowledge without Epistemology ¹

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Abstract: The universality of scientific principles, theories, laws is never purely “objective”, it has a strong anthropological component. A theory of knowledge invoking transhistorical agencies is therefore not only dead — it was never alive; its so-called successes are nothing but an immense chimera. Scientific research knows no universal boundary conditions or standards whether of a conventional, aprioristic, or empirical kind but uses and invents rules according to circumstance without regarding the selection as a separate “epistemic” act and often without realising that an important choice is being made.

Keywords:

Laudan;
Parmenides;
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rules;
science;
theory of knowledge

Prophets of decay who are rather numerous in a time they themselves are calling the postmodern age have declared the end of epistemology. They did not use simple words; for example, they did not say “epistemology stinks” or “epistemology is counterproductive” or “epistemology is an empty game”. They relied on practices such as deconstruction or hermeneutics which are even less comprehensible than the monster they were trying to exorcise. Now it is true that theories of knowledge lost much of their former bite and that they seem to succeed

¹ Editors' note. This text was written in 1992 in English and then translated into German by Hans Günter Holl. It was published under the title “Erkenntnis ohne Theorie. Vom Nutzen der Abstraktion und vom Recht des Besonderen” (*Lettre Internationale* 16, Frühjahr 1992, pp. 66–71, <https://tiny.pl/dq2fk> [21.02.2024]). The abstract and keywords were added by the editors.

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only because of an astounding blindness on part of their proponents. However, there are better ways of dealing with this phenomenon than entering the subject I just mentioned. One such better way (and one I intend to follow) is to trace the course of epistemology from its beginnings to the present time.

Beginnings are not easy to nail down. When did astronomy begin? Seidenberg and van der Waerden postulate international mathematics and astronomy which between 3000 and 2500 BC spread from Central Europe to Great Britain, the Near East, India and China. De Santiliana and von Dechend assume that the precession of the equinoxes was discovered when vernal equinox left the constellation of Gemini. Alexander Marshack's research suggests astronomically relevant notations around 30 000 BC. And so on. However, this uncertainty concerning *absolute* beginnings does not prevent us from using historical incisions as *relative* starting points of new phenomena. The incision I have in mind occurred in Greece, somewhere between 900 and 500 BC.

This was a period of major changes. Heroic forms of life receded, the city state with its very different requirements took their place (the resulting conflict was one of the main topics of tragedy). Money replaced gift giving and the exchange of goods, local gods merged, gained in power but lost in concreteness and humanity. Abstract laws, not personal relations defined the role of citizens in a democracy, wars were increasingly fought by professional soldiers — and so on. These changes occurred partly “by themselves”, partly in the course of attempts to get out of sticky situation (most moves towards democracy were of the latter kind). Epistemology arose amidst this confusion, in the following manner.

We start with a rich spectrum of “epistemic” terms taking account of the many situations human face and the many ways in which they react to the world. Objects were viewed as aggregates of events, not as “real natures” surrounded by deceitful “appearances”. One of the oldest arguments for scepticism which is found in Sextus Empiricus and which still occurs in Ayer's **Foundations of Empirical Knowledge** (1940) is that a rudder looks bent in water but feels straight to the touch. Separating appearance and reality and assuming that reality reveals itself through appearances we run into contradiction. No contradiction arises when the felt rudder and the seen rudder are considered as rudder — events which together with other events of this kind constitute the object referred to as/described as “rudder”. Finally, there was no strict separation between physical prop-

erties and their emotional impact. The physical heat and the heat of passion were closely connected.

All this changed in the course of the developments I have just described. The changes were sufficiently drastic to call them a “beginning”. This beginning or, as I shall call it, the rise of epistemology in the West has the following features.

First, the spectrum of “epistemic” terms is considerably reduced. Some terms disappear, others converge in meaning and finally coalesce. *Secondly*, we have a gradual separation, in objects, between what is later called their “reality” and the (often descriptive) ways in which they “appear”. Like the other social changes these two developments occurred without any explicit and clearly planned contributions from individuals or special groups. Nobody said: “We must improve our language and make it more efficient”. What happened was rather similar in its anonymity to the gradual transition from gift giving to an exchange of commodities and from there to a monetary economy.

An example of the second type of change occurs in the **Iliad**.² Achilles was offended by Agamemnon and withdrew from battle. Emissaries, Odysseus among them, agree that there was an offence; but, they say, matters have been set right and Achilles’ honour is now restored. Now honour, like the rudder in my earlier example was an aggregate containing individual and collective actions and events. Some of the elements of the aggregate were: the role (of the individual possessing or lacking honour) in battle, in the assembly, during internal dissension; his place at public ceremonies; the spoils and gifts he received when the battle was finished and, naturally, his behaviour on all these occasions. Honor was present when (most of) the elements of the aggregate were present, absent otherwise.³ The steps enumerated by the emissaries correspond to the list — Achilles’ honour has indeed been restored. Achilles disagrees. “Equal fate” he says, “befalls the negligent and the valiant fighter; equal honour goes to the worthless and the virtuous”.⁴ Reacting in this way he turns the traditional *elements*, or *parts* of honour into untrustworthy *appearances* of a new entity which clashes with the received conceptions, is poor in content but eventually becomes more powerful than its

² Cf. Book 9, 225ff.

³ Cf. **Iliad** 12, 310ff — Sarpedon’s speech.

⁴ **Iliad** 12, 318f.

concrete predecessor. This is an early instance of the real-apparent dichotomy which soon became a basic ingredient of knowledge.

I repeat that the changes I described so far were neither supported by argument nor explicitly encouraged by special professions. *They simply occurred.* The *third* characteristic of the “Rise of Epistemology” is that an aggressive new group of social critics, the philosophers, lived off the changes like parasites; they dwelled on them in an exaggerated way, heaped scorn on what has gone on before and were listened to because the ground was already prepared. Take Xenophanes’ remark that

if cattle, or lions, or horses had hands, just like humans;
if they could paint with their hands, and draw, and thus create pictures –
then the horses in drawing their gods would draw horses;
and cattle would give us pictures and statues of cattle;
and therefore, each would picture the gods to resemble their own construction.
Aethiopian gods — snub-nosed and black
Thracians — blue eyed and blond [...].⁵

Here is what some modern writers have said about these lines. William Guthrie speaks of “destructive criticism”.⁶ Micrea Eliade, otherwise an intelligent judge of social matters, praises “Xenophanes’s acute criticism”,⁷ while Karl Popper reads the fragments as the “discovery that the Greek stories about the gods cannot be taken seriously because they represent the gods as human beings”.⁸ Friedrich Nietzsche offered the following piece of bombast:

No fashion helped them [the philosophers] and paved their way. Thus, they formed what Schopenhauer, in opposition to a republic of scholars called a republic of men of genius: one giant calls out to another across the desolate intervals of time and the

⁵ Hermann DIELS, Walther KRANZ, **Die Fragmente der Vorsokratiker**, Weidmannsche Buchhandlung, Berlin 1959, 11, B 15, 16.

⁶ William Keith Chambers GUTHRIE, **A History of Greek Philosophy, Vol. 1**, Cambridge University Press, Cambridge 1962, p. 370.

⁷ Micrea ELIADE, **Geschichte der religiösen Ideen, Band 2**, Freiburg im Breisgau, Herder 1979, p. 407.

⁸ Karl R. POPPER, **Auf der Suche nach einer besseren Welt**, Piper, München 1984, p. 218.

lofty exchange between minds continues undisturbed by the noisy doings of the midgets that crawl beneath them [...].⁹

while Hegel spoke more calmly of a “dissatisfaction with the world of the senses” and the appearance of “pure thought”.¹⁰

Concentrating on the opinions of special individuals and taking it for granted that speech alone, when properly shaped and presented can damage the strongest tradition the gentlemen overlook that Xenophanes’ criticism, for example, worked only because anthropomorphic gods were no longer the fashion — otherwise his lines merely elaborate a popular view. “You are so right” — a believer might have said — “our gods are tribal gods; they look like us, think like us, but are much more powerful. I expect that other tribes or nations have different gods, just as they have different rulers and that even the animals have gods of their own”. Xenophanes, therefore, did not *start* the removal of anthropomorphic gods; he articulated a phenomenon that had arisen before, among “the midgets that crawl[ed] beneath him” and without whose assent his mockery would only have caused puzzlement. For local gods had indeed merged, they had shed some of their individual properties, had gained power but lost character, definition and humanity — they were well on the way to becoming pure Being. (Gilbert Murray conjectures that the differences between local gods were evened out as the result of travel.) *Given this background* Xenophanes’ mockery *sounded* like an argument — that is all we can say.

The situation reveals a feature of argument that is unknown to Platonizing logicians and the philosophers who follow their lead. A story can be read in many ways, as an explanation of things that are being accepted, as an ironical characterization of things that are being rejected, as an artistic display, as an example of a valid argument — and so on. The sequence:

cotton needs a hot and dry climate;

England is cold and damp;

cotton does not grow in England

⁹ Friedrich NIETZSCHE, “Die Philosophie im tragischen Zeitalter der Griechen”, in: Friedrich NIETZSCHE (ed.), **Werke in drei Bänden, Band 3**, Carl Hanser, München 1954, p. 355 [353–388].

¹⁰ Georg Wilhelm Friedrich HEGEL, **Werke, Band 18, Vorlesungen über die Geschichte der Philosophie I**, Suhrkamp Verlag Frankfurt am Main 1971, p. 279.

contains three different pieces of information for illiterate peasants in Uzbekistan in the Thirties;¹¹ for a student of logic in Berkeley it is an example of a simple inference. But the student is not ahead of the peasants; put in their position and presented with a list of facts he will perceive connections, fail to concentrate on the individual items and thus will be slowed down in his reactions to them. At any rate — Xenophanes' lines *became* a criticism because of the surroundings in which they were uttered, they did not *create* these surroundings.

The high point of the development is *Parmenides*. At first sight Parmenides seems to continue an older (and still surviving) research tradition which tried to reduce the manifold events of this world to a few simple principles. According to Thales (so Aristotle's story goes) the fundamental principle was a substance, and it was water. Thales most likely had arguments for his choice just as Prout had arguments for the assumption that the hydrogen atom was a fundamental building block of nature. Anaximander replaced water by an indefinite substance which could appear in different forms and which he called *apeiron*. Anaximenes replaced it by air, again using plausible arguments. Parmenides makes a suggestion which apparently fits right into this sequence: the entity sought is neither water, nor the *apeiron*, nor air — it is Being. However, Parmenides used logic, not plausible argument to choose his principle, he nailed down the consequences of his choice and he separated them from tradition and common experience just as scientists today separate their theoretical conceptions from what they see and hear when washing dishes at home. Parmenides did not invent logic — logical forms and patterns of argument played a large role in the practice of Greek and Near Western law. But he simplified the context, made it absolute, and relied almost exclusively on the type of argument now called *reductio ad absurdum*. His premise — *estin*: Being is¹² — is the first conservation law in the West; it declares the conservation of Being. It influenced thinking about nature either directly (Lavoisier, Robert Mayer) or indirectly, until today. It seemed plausible, at least to some of his listeners and readers, because of the general tendency towards abstraction I described above. From the premise Parmenides derives that Being does not change and that it has no parts. It does not change: change, for being, could only be to not-Being;

¹¹ Cf. Alexandr R. LURIA, *The Making of Mind: A Personal Account of Soviet Psychology*, Harvard University Press, Cambridge Mass. 1979, chapter 4.

¹² Cf. DIELS-KRANZ, 18, B 7,7.

not Being does not exist, hence Being does not change.¹³ It has no parts: a part must be different from the rest, the only possible difference is between being and not-Being, not-Being does not exist, hence there are no parts either.¹⁴ (Here follows an interesting theory of continuity that was elaborated by Aristotle and is by far superior to Galileo's theory — and Weyl's.) For the present purpose the most important conclusion is, however, this: Parmenides' results conflict with experience, tradition and commonsense or, to use his expression, that *e'thos poly'peiron*¹⁵ fails to provide knowledge — thought alone does.¹⁶

With this statement we have the first explicit theory of knowledge in the West. The theory subdivides phenomena into what is real, objective, trustworthy etc., (I am not using modern terms) and what is unreal, subjective, misleading. The subdivision has survived until today. It underlies the distinction between the arts and the sciences and, within the sciences, between systematic (objective, standardised) and anecdotal (subjective, historical) evidence. It played (and still plays) a large role in debates about the scientific status of certain types of historical research. The social sciences especially were distorted by trying to adapt to the Parmenidean framework. The dichotomy also gave intellectual support to Western domination over non-Western tribes, nations, cultures. Note, incidentally, that Parmenides' theory cannot be refuted by just pointing to the empirical fact of change. According to Parmenides this "fact" is a chimaera, just as dreamt levitations are a chimera for a Newtonian. Further means are needed to turn it into a source of truth (events such as the "Copernican Revolution" have been distorted by neglecting this feature of conceptual change).

I now come, *fourth*, to some consequences of the Parmenidean arguments. As I said before these consequences evolved under the impact of general trend towards abstraction and theory. Not all of them were the direct result of a reading of

¹³ Cf. DIELS-KRANZ, 18, B 8, 6ff.

¹⁴ Cf. DIELS-KRANZ, 18, B 8, 22ff.

¹⁵ DIELS-KRANZ, 18, B 7, 3.

Footnote added by the editors. "habit born of experience" in Guthrie's translation. "It is a habit of thinking acquired by the repeated cultural experience" (Nicola Stefano GALGANO, "Non-being in Parmenides, DK B2", *Anais de Filosofia Clássica* 2020, Vol. 28, No. 6, p. 5 [1–34]).

¹⁶ Cf. DIELS-KRANZ, 18, B 1, 21.

Parmenides' poem. But the poem did have an influence though often in an underhanded way.

In mathematics definitions and arguments involving constructions were gradually supplemented with and even replaced by abstract arguments. Árpád Szabó ascribes this to the intrusion of indirect proofs and credits Parmenides with having been the first to introduce them. Others disagree. Reliance on the perception of symmetries (cf. the enclosed figure which shows that the sum of angles in a triangle is equal to the "straight angle" — of 180 degrees) was slowly eroded by the demand for a more intellectual approach. The resulting opposition between intuition and thought, construction and logical proof has survived until today.

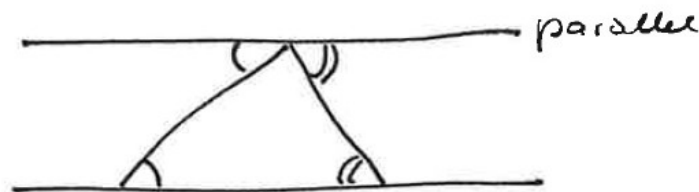


Figure 1. Drawing for the text made by Feyerabend

In medicine the connection with Parmenides is easier to ascertain. Traditional medicine as it is described in some tracts of the *Hippocratic Corpus* was an empirical discipline. There was no general definition of illness; there were lists of afflictions which served as guides for those already trained in recognizing the relevant symptoms. The physician relied on his mind, his eyes, ears, hands, and on his ability to identify complex perceptual patterns. Empedocles who followed Parmenides gave a theoretical definition of illness. He assumed four elements, water, fire, earth and air; these were abstract essences, not the substances usually associated with the terms. Everything, the human body, included was said to be composed of the essences and illness was defined as imbalance between them. The reaction of the medical practitioners was swift and clear. "I fail to understand", writes the author of **Ancient Medicine** (chapter 15):

how those [...] who abandon the old method and rest the *techne* on a postulate treat their patients on the lines of this postulate. For they have not discovered, I think, an

absolute hot and cold, dry and moist [an alternative way of referring to the abstract elements] that participates in no other form. But I think they have at their disposal the same foods and the same drinks we all use, and to the one they add the attribute of being hot, to another, dry, to another, moist, since it would be futile to order patients to take something hot, as he would at once ask “what hot thing?”. So they must either talk nonsense or take recourse to one of the known substances.

The implied dichotomy between body theoreticians and healers has also survived until today.

The most curious outcome of Parmenides’ reasoning was its effect upon opponents. Already the sophists formulated their objections and their alternatives in Parmenidean terms. For example, the sensations of the ancient empiricist were not ingredients of commonsense; they were theoretical entities similar to Parmenides’ One. And the cultures enumerated by relativists are not living things which change and interact, they are instances of *e’thos poly’peiron*. Moreover, the ancient as well as the modern opponents still offer a *theory* of knowledge, i.e. a general account that tries to assemble all types of information under a single (and rather empty) concept. Only the sceptics (the ancient sceptics, not Hume) avoided that trap. The influence of the ancient theoreticians and of the background which gave substance to their claims was indeed enormous.

However — and now comes an important observation which further complicates the story — it was not only influence. Older attitudes and ways of thought persisted and found influential (though, as I indicated, somewhat contaminated) defenders among the sophists and in Aristotle. Plato, who speaks of the “ancient battle between philosophy and poetry”¹⁷ gives indirect evidence of their power: the first answers to Socrates’ “what is...?” questions are always lists and those who provide them resist Socrates’ drive toward unity.¹⁸ More recently philosophers such as Wittgenstein and, in greater detail, Austin have shown how complex, many-sided *and sensible* commonsense accounts are when compared with philosophical analyses. They support “the other side” which, incidentally, raised its head numerous times, in the guise of nominalism, empiricism, scepticism, historicism, though always streamlined by the quest for theory. Still, the Parmenidean tradition was, *fifth*, strong enough to give rise to the following problem: if truth is indeed as separated from our common lives as Parmenides seems to indicate,

¹⁷ PLATO, **The Republic**, 607b.

¹⁸ Cf. PLATO, **Meno**, 72d; PLATO, **Theaetetus**, 148b.

then how can we ever reach it? Or, to use a modern formulation — *how is knowledge possible?*

It is important to repeat that the question is not a natural result of an alleged urge for knowledge but obtains its power from a combination of individual machinations and social tendencies. The machinations make sense and seem compelling because their premises (Parmenides) or hidden assumptions (Xenophanes) resonate with the tendencies. The fact that other forms of knowledge remained influential and often raised their heads shows that this sense and this compulsion were limited and empirical, not universal and necessary. The alternatives populated not only books, but real life; they aggravated idea hunters like Hegel who interpreted Plato's use of mythical forms of discourse as a sign of an "impotence of thought";¹⁹ and they are now being strengthened by development workers who try to remove the damage done by an unthinking imposition of the more abstract parts of Western Civilization, by local initiatives in the Western countries themselves and they are constantly being nourished by the arts, those lasting strongholds of idiosyncrasy, anarchy and contrariness. "One of the reasons for the asphyxiating atmosphere in which we live without possible escape and remedy", writes Artaud,

and in which we all share, even the most revolutionary among us – is our respect for what has been written, formulated, or painted, what has been given form, as if all expression were not at least exhausted, were not a point where things must break apart if they are to start anew and begin afresh.²⁰

The only obstacle to fully recognizing the alternatives are the sciences which have tremendous authority and which seem to contain precisely the kind of "objective" knowledge Parmenides defended. It was by reference to the sciences that Kant tried to answer the question "How is knowledge possible" and it is by reference to the sciences that modern realists uphold the appearance/reality dichotomy. Do the sciences support their efforts?

There are two answers to this question and they are both negative. The first answer rests on scientific results, the second on the way in which scientific results

¹⁹ "Ohnmacht des Gedankens", Georg Wilhelm Friedrich HEGEL, **Werke, Band 19, Vorlesungen über die Geschichte der Philosophie II**, Suhrkamp Verlag Frankfurt am Main 1971, p. 31.

²⁰ Antonin ARTAUD, **The Theatre and its Double**, trans. Mary Caroline Richards, Grove Press Books, New York 1958, p. 74.

are being obtained.

According to the first answer *the dichotomy conflicts with one of the best confirmed scientific theories that ever existed*, viz. the quantum theory. The conflict was sharpened, in a paradoxical way, by the very thinkers who tried to uphold objectivity.

The second answer is that, contrary to widespread opinion, *science is an elaboration of the “other side”, i.e. of the traditions Parmenides wanted to overcome*. It is not easy to show this in detail — too many prejudices lie in our way. But consider the following story and the argument embedded in it.

We start with the usual exploitation of the Parmenidean image of science: Kantianism, Neopositivism and its noisy offspring, critical rationalism. There are philosophers in the sense of Parmenides, abstract accounts of the nature and the conditions of knowledge. They not only claim to have found what scientists do, they also claim to know what they ought to do.

The next step is Kuhn. Kuhn showed that the sciences do not fit the philosophical pattern and that they would wither away if one tried to force them into it. Kuhn still uses general notions like “paradigm”, “revolution”, “mature science” to make his point. He thereby encouraged abstract accounts of a different kind, which are as unrelated to their subject matter as were the essays of the Kantians and the positivists. The further step that was needed to get out of the Parmenidean trap was taken by younger and very active generation of historians who concentrated on individual episodes, who have almost produced a “history in the raw” and whose conclusions no longer coalesce into a single coherent system of thought: a cookbook of more or less successful recipes is all we get. Science is not therefore “irrational” — cooking certainly is not an irrational activity — there exist arguments for every move that is being made. But whatever universality we find comes from the actions of scientists who, having immersed themselves in various problem situations and using their experience, cunning and other forms of “tacit knowledge”, now happen to treat different situations in a similar way. The universality of scientific principles, theories, laws is never purely “objective”, it has a strong anthropological component. A theory of knowledge invoking trans-historical agencies is therefore not only dead — it was never alive; its so-called successes are nothing but an immense chimera. To illustrate this situation I shall

now discuss a recent attempt to revive old-style philosophies namely L. Laudan's book **Science and Relativism** (Chicago 1990).

Laudan's book is a dialogue between four characters — a relativist, a pragmatist, a realist and a positivist. Relativism is the main target, pragmatism the philosophy closest to Laudan's heart. The main topic is the nature and growth of scientific *knowledge*. What is actually being discussed is the fate of high knowledge. What is actually being discussed is the fate of *high theory*, to use a term from elementary particle physics. This leaves out (a very incomplete list): botany and its various branches, geography, ecology, descriptive astronomy, in short all those subjects which accumulate and classify observations without transcending them; it also leaves out phenomenology (in the sense in which this term is being used in high energy physics), experimental design, practically oriented approaches such as Noll's mechanics, models such as the models used to calculate, say, lunar perturbations, experimental inquiry which enriches knowledge in its own way (spectroscopic handbooks, lists of resonances, catalogues of celestial objects such as the Messier catalogue or the Cambridge catalogues of radio astronomy) — as well as the approximations, special assumptions, *ad hoc* hypotheses, designed to bring some kind of coherence into this untidy mass of facts, fragments of theory, tacit assumptions etc. etc. No doubt Laudan believes that the idiosyncrasies of the particular can be absorbed by theory and that models, collections, approximations, phenomenology are just steps on the way. The trouble is that there was little research in the past to check this belief and that more recent inquiries (Hacking, van Fraassen, Cartwright and others) have thrown serious doubt upon it. Whatever unity arises in the course of Laudan's debate is therefore a result of omissions — it is a unity of neglect, not a unity produced by synthetic efforts.

The debate further dilutes this already quite reduced material. Epistemology, says the pragmatist, did not vanish with the demise of certainty. There "remain important epistemic questions"²¹ such as how best to construct theories, when to regard a theory as well supported, when to prefer it to a rival.

These are important questions indeed. They faced Einstein when he wanted to combine the insight of special relativity with the principle of equivalence; they faced scientists later on when the Brans-Dicke suggestions led to difficult experi-

²¹ Larry LAUDAN, **Science and Relativism: Some Key Controversies in the Philosophy of Science**, University of Chicago Press, Chicago 1990, p. 136.

ments and a proliferation of theories of gravitation; they accompany every step of scientific research. But can they be answered by a person who replaces science by a caricature, is unaware of its divergent ingredients, lacks the mathematical skills, the judgement and especially the “tacit knowledge” which define an area of inquiry? The older epistemologists who believed that such details were part of a general structure which could be detached from science and judged independently said yes. Laudan agrees. True, he rejects any “perfect-being epistemology”²² and wants to evaluate scientific standards empirically, using “any of the forms of reasoning appropriate to scientific research”;²³ science itself is supposed to tell us which standards are acceptable and which are not. But as I just pointed out, the science Laudan discusses is a fragment, not the real thing and the “forms of reasoning” he refers to are those of logician dealing with stable entities of well-defined content, not those of scientist facing an incomplete and incoherent material.

Our theories, says the pragmatist, “are worthy of acceptance [...] because they work”;²⁴ “they confer abilities on us — abilities to control, predict and manipulate nature”²⁵ — “our rules are worthy of acceptance, because they have shown themselves to be able consistently to pick out theories which work with a pretty high degree of reliability”.²⁶

The quotation suggests the following scenario: there are rules (standards, norms), and there are theories. The rules are let loose on the theories and encouraged to make their favourite choice. Some rules choose losers — they are discarded. Others “consistently pick out theories that work” — they are invited into the Epistemological Hall of Fame.

The scenario is most unrealistic. First, because many theories which have surprising successes in one area fail in others. Newton’s mechanics was in this position, all through its history. Shall we say that it worked? All the time? Some of the time? Never? That depends on standards which decide when a theory is supposed

²² LAUDAN, *Science and Relativism...*, p. 105.

²³ LAUDAN, *Science and Relativism...*, p. 99.

²⁴ LAUDAN, *Science and Relativism...*, p. 106.

²⁵ LAUDAN, *Science and Relativism...*, p. 107.

²⁶ LAUDAN, *Science and Relativism...*, p. 106.

to be acceptable — the very standards Laudan wants to define by his procedure. Secondly, high theory and phenomenological approaches often seem to be successful in the same area — but they are constructed in different ways. An honest pragmatist would of course prefer phenomenology and engineering approaches which (usually, but not always) fit the facts much better than the theories allegedly backing them (and which have to go through approximations, *ad hoc* adaptations, questionable assumptions such as Dirac's ocean of occupied states to reach the facts). They "work" better, according to Laudan's own criterion — yet all his examples come from high theory. Thirdly, theories which "work" do not enter the world ready-made and their success is not independent of the treatment they receive. Theories start from modest beginnings, they go through a complicated process of growth, suffer some encouragement and numerous defeats and need different incentives and/or correctives at different stages of their development. Each incentive (corrective) can be formulated as a rule, each rule contributes to the survival and eventual success of the theory, each of them "picks out" the right candidate which means that Laudan's Hall of Fame will contain mutually incompatible standards — unless standards are tied to the situations in which they are used. But then a general account of when a particular standard is to be applied becomes as impossible as a general account of the conditions of historical events. All we can say is who did what in which circumstances, what resulted — and we may try to remember the actions for future reference just as a politician tries to remember what his predecessors did in similar cases.

A brief look at some of the standards Laudan is willing to defend shows the extent to which he still depends on old-style philosophies. According to his mouthpiece (the pragmatist) highly confirmed predictive schemes are to be preferred to theories which make some kind of sense (they conform to plausible symmetry principles or metaphysical views) but lack empirical support. "Our allegiance" says Laudan, should be to the former; the latter are "unacceptable".²⁷ He overlooks that "unacceptable" views can and often did discredit their "acceptable" rivals. That was done either by a cunning *transfer* of the evidence (example: Copernicus' discussion of the movement of the earth in Book 1 of his **De Revolutionibus**, imitated and elaborated by Galileo) or by an *analysis* which, starting with an "unacceptable" point of view showed the spuriousness of the evidence against it

²⁷ LAUDAN, *Science and Relativism...*, p. 30.

(example: Einstein's analysis of Exner's measurements of Brownian motion),²⁸ or by purely logical analysis of the presuppositions of an apparently decisive experiment which was *motivated* by a strong belief in an "unacceptable" alternative (example: Planck's analysis of Kaufmann's experiments as described in chapter 6 of Zahar's **Einstein's Revolution**)²⁹ or by simply refusing to take the evidence at its face value (many examples). In all these cases "allegiance" went to the empirical underdog, used him in ways that denied success by almost all the participants in Laudan's dialogue³⁰ and led to major scientific advances. It may be true that "if an approach is bogged down, and failing to produce interesting new results, [scientists] quickly vote with their feet";³¹ opportunists exist in all professions. But discovery often came from those who opposed the fashions of the time. Of course, even the most metaphysically inclined scientist hopes eventually to confirm his conjectures by novel observations and striking experiments — but to achieve *this* aim, he must first suspend his allegiance to a *given* harmony between theory and fact.

Arguing further along this line we are led to suspect that scientific research knows no universal boundary conditions or standards whether of a conventional, aprioristic, or empirical kind but uses and invents rules according to circumstance without regarding the selection as a separate "epistemic" act and often without realising that an important choice is being made. For example, the arrival of large-scale experimental equipment in high energy physics changed the older (and empirically selectable) demand that experiments must be repeatable, but without any explicit "epistemic" debate.

None of the participants of the dialogue, the relativist included seems to be aware of this feature of scientific practice. Trying to rise to what they think is a more "philosophical" level they engage in a debate where the relativist turns historical facts (defeated theories *occasionally* stage a triumphant comeback discarded views *occasionally* become powerful critics of their successful rivals) into

²⁸ Cf. Felix M. EXNER, "Notiz zu Brown's Molecularbewegung", *Annalen der Physik* 1900, Vol. 502, No. 2–3, pp. 843–847, <https://doi.org/10.1002/andp.19003070813>.

²⁹ Cf. Elie ZAHAR, **Einstein's Revolution: A Study in Heuristic**, Open Court, Chicago and La Salle, Ill. 1989, pp. 201–226.

³⁰ Cf. LAUDAN, **Science and Relativism...**, p. 84.

³¹ LAUDAN, **Science and Relativism...**, p. 156.

abstract principles (“any theory [...] is as good as any other”) ³² while his opponents think that having thrown doubt upon the principles, they have also disposed of the facts. ³³

Altogether the tendency to emphasise logical possibilities (Duhem-Quine argument etc.) gives the debate an air of unreality. Take the assumption that, given some body of evidence, there exist “indefinitely many — arguably infinitely many” ³⁴ mutually incompatible theories which are compatible with it. The relativist takes the assumption for granted. But how can he do that? Given a finite universe and a finite lifetime for the human race there can only be a finite number of sentences — so, has relativism become Platonistic? Besides, Platonic infinities which are not trivial (infinitely many possible values of a constant within the range of error) and which satisfy certain minimal conditions have to be argued for — they cannot simply be assumed. Are there infinitely many prime numbers? It needs a (simple) proof to decide the question. Yet even when Platonic infinities are assumed, and even when they exist, we still cannot infer that theory selection is “arbitrary”, ³⁵ that “all rival hypotheses are on the same footing” ³⁶ or that social factors play a “key role in explaining the doxastic life of scientists”. ³⁷ A general may not know the infinitely many ways in which angels can win a battle — but this makes his decisions arbitrary, or one decision as good as another only in the eyes of a god contemptuous of human affairs. In *this* world (and here I apply an argument which Aristotle used vis-a-vis Parmenides) — which is the world where scientists try to understand nature and philosophers scientists — we have restricted resources both as regards the theories which are being offered for choice and the ways of choosing and doing science means operating within these resources. Inferring arbitrariness from the limited nature of our resources also means making a comparison (between the resources and a world they can never reach) which is itself beyond the resources and, therefore, “arbitrary”. Strangely

³² LAUDAN, *Science and Relativism...*, p. 55, see also p. 76.

³³ Cf. LAUDAN, *Science and Relativism...*, p. 84 and passim.

³⁴ LAUDAN, *Science and Relativism...*, p. 49.

³⁵ LAUDAN, *Science and Relativism...*, p. 45.

³⁶ LAUDAN, *Science and Relativism...*, p. 54.

³⁷ LAUDAN, *Science and Relativism...*, p. 157.

enough it is the relativist of the dialogue who produces metaphysical romances of this kind.

Turning now to the role of social conditions we can at once admit that they have an effect, though not in the ways envisaged by relativism (and some social scientists). To start with, modern pluralistic societies contain many trends and a wide variety of reactions to them — just look at the many different forms of the-atre, literature, the arts, some wildly critical of prominent habits. Facing this plu-rality a scientist has a choice; he is no longer at the mercy of a single ideology. Be-sides, ideas taken over from “society” are never left unchanged. Aristotle mo-bilised commonsense against the views of Parmenides and Plato. He *consciously* tried to preserve it — he was not simply overwhelmed — but he also *revised* it, using the achievements of those he opposed. The same is true of the sciences. Even a scientist who has fallen for some powerful fashion has to pay attention to a second fashion, namely, the situation in his own subject.

Do we need a special subject, philosophy, to “explain [...] the success of sci-ence”? ³⁸ No, we don’t. First, because it is not “science” which is successful — some so-called sciences are a pretty sorry sight — particular models, theories, proce-dures are. Secondly, because scientists, on the way to success invent and use proce-dures which, when detached from the area of their application *look* like global principles but lead to success only because they are not so *used*. ³⁹ It is true that scientific standards have been defended by philosophers and may even have been introduced by them. But different scientists then applied the standards in differ-ent ways and without paying much attention to their philosophical origin. The bi-ologist Luria prefers “predictions that will be strongly supported or sharply re-jected by a clear-cut experimental step”, ⁴⁰ he shows little enthusiasm for a theo-retical science that is “loaded with weak inferences” ⁴¹ and reports that Fermi, for this very reason, was somewhat cool towards the general theory of relativity. Gauquelin assembled impressive evidence for astrological correlations (his “Mars effect”) — yet few empirically minded scientists have shown readiness to accept

³⁸ LAUDAN, *Science and Relativism...*, p. 167.

³⁹ Cf. what I said about Laudan’s method of selecting and confirming scientific standards.

⁴⁰ Salvador Edward LURIA, *A Slot Machine, a Broken Test Tube: An Autobiography*, Harper & Row, New York 1985, p. 115.

⁴¹ LURIA, *A Slot Machine...*, p. 119.

his conclusions. Supergravity does not object to tests but makes them dependent on what happens during the early moments of the universe. Naturally, many apparently direct refutations can be and are being circumvented by suitable explanations. Feynman is not at all pleased — he wants a more direct relation between a theory and the facts.⁴² All the parties just mentioned are scientists, they are all empiricists, they all favour experiments, but empiricism has a different meaning for each of them. One might say that epistemological principles become effective within the sciences only by losing their (perhaps unambiguous) philosophical content and acquiring a (highly ambiguous) scientific content (Platonic unities becomes lists when turned loose on the world). Thirdly, many so-called successes can be explained by purely scientific means. Why was Newton's theory successful in explaining some simple features of planetary motion? Because space is curved etc. and Newton's approach was a good approximation to that scenario.

Epistemology is not the only discipline that tries to explain and to control an activity capable of standing on its own feet. Every area of human endeavour is surrounded by generalities which may be useful when immersed in and dissolved by practice but which impoverish our resources when imposed unchanged. Brecht had a beautiful and very "rational" theory of theatrical action but his plays either fell flat on their face — which they did when they were as didactic as the theory demanded — or they moved the audience, in which case the theory was left behind. The solution is not, as some extremists have suggested, to abolish generalities altogether; the solution is to bring them in close contact with the topics they are about. More concretely: it does not make sense to have calculating machines advised by epistemologists unaware of the nature of the scientific discoveries they praise with such abandon, or to have playwrights concerned only with box office receipts advised by aestheticians incapable of facing an audience without a heavily annotated manuscript in their hands.

What we need are thoughtful scientists (artists, playwrights, priests, politicians etc. etc.) who are experts in the twin arts of modifying what is general by tying it to particulars and of explaining what is particular in general terms — in other words, we need a marriage of universals and particulars. Such a marriage would be the end of philosophy (epistemology, aesthetics etc.) as a separate subject with standards, problems, solutions of its own but it would also be the begin-

⁴² Cf. P.C.W. DAVIES and Julian BROWN (eds.), *Superstrings: A Theory of Everything?*, Cambridge University Press, New York 1988, p. 194.

ning of a rich and fruitful life. Now the interesting thing is that the marriage already exists — it has existed for centuries — and that it has produced numerous offspring. The art works that surround us, the scientific theories which resemble them in so many ways are all products of a close collaboration between far reaching fantasies, the concepts and procedures that were invented to give them shape and the idiosyncratic particulars constituting the lives of all of us. But philosophers — intent on remaining in control (remember Plato’s talk about the “ancient battle between philosophy and poetry”) have tried and are still trying to prove that we are dealing with a master-slave relation where wise masters pushing around capable but rather ignorant slaves succeed in shaping the world after their own image. Needless to say — education has to be thoroughly changed to remove this farce from our midst.

Now assume that what I have said is true — does preaching this truth contribute towards solving the problems of our time? Can it reduce the mass murders that are happening right now in many countries, can it remove the intolerance, the lack of concern and understanding, the narrow egoism of individuals, businesses, institutions which have ruined the earth, are aware of the crime but still show no signs of regret or reformation? Not all intellectuals are asking questions such as these. Many are content with scoring a victory over fellow intellectuals and thus to accumulate a reputation in small autistic circles. But there are writers, artists, scientists, theologians, professional philosophers among them who do consider the matter, who think that ideas can indeed make a difference to the lives of our generation and of future generations and who let this conviction guide them in their thoughts and their writings. I am less optimistic. Asked what I have done, by this paper, by the talk that preceded it and generally, by my rather chaotic opus to bring a little peace and happiness into the world I can only reply: nothing. Nothing at all. And why? Because ideas are weaker than the most gentle breeze — one can move right through them. They become powerful only if the situation has already been prepared.⁴³ Does this mean that a writer should strive for a connection with power, that (s)he should adapt his/her text to the actual and potential sources of power or, as the fashionable phrase runs, should they try to be relevant? My answer is no, they should not. And my reason is that *relevance can only be determined after the event*. Social circumstances are ambiguous in the sense that a situation which seems to condemn certain actions and words to futil-

⁴³ Cf. my comments on Xenophanes and Parmenides in the text above.

ity is often unstable, and may be blown up by the very same actions and words. We do not know whether what we are doing is “relevant” — until we have done it and even then the effect may take a long time to appear. So, all we can do is listen to our friends (if we have any to read, make music, watch soap operas, if that is our inclination, consider what is going on around us and take our clues from there. I, personally, would add that we should be careful not to recommend or participate in actions which are dictated by hatred and are liable to increase it. I don’t say this because I have a theory about the effects of hatred, but because I, I personally, do not intend to be guided by it. That is all I can say. The search for a more objective justification is just as chimerical as the theories which advise us that the justification exists.

Paul K. Feyerabend

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