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January-February 2007

(Reflections on Critical Pragmatism, Part 3)

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Theory and practice II: the rise and fall of the "primacy of theory"

Welcome back! I wish you a happy new year. In the last *Bimonthly*, we made some basic observations concerning the relationship of theory and practice in critical pragmatism. As promised, I want to continue this discussion and provide some evidence for the relevance of those observations. I would like to show that they are representative of the prevailing notion of research in mainstream science theory and indeed may help us understand some essential difficulties and limitations of that theory. To this end, I propose to examine one of the major examples of contemporary mainstream science theory, Karl R. Popper's "critical rationalism," and the way its focus on theory prevents it from being conducive to reflective practice.

Why theory matters In all strands of contemporary science theory of which I am aware, theory is considered to be an important vehicle for knowledge generation – rightly so, for a number of reasons. To mention just a few basic reasons, theoretical conjectures influence the questions we investigate in the first place; they determine the choice of research methods; and they condition the way we interpret research results as well as the conclusions we draw with a view to practical action.

The basic idea is well known and hardly controversial: it is not sufficient for knowledge that our beliefs or hypotheses conform to experience and allow us to predict and influence future events; we must also be able to explain why this is so. If I predict that it will rain tomorrow and this actually happens, it could simply be by chance; hence, we must be able to rule out the possibility that a belief is true by chance only. Similarly, if as a researcher or professional I apply some methodology and find that "it works," I should be able to explain why this is so, otherwise I cannot have faith in the results. In a famous formula that goes back to Socrates, knowledge is "*justified true belief*," that is, we must believe what we believe (and then find empirically true) for appropriate reasons. The source of such reasons is what we call a

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theory, a model capable of describing, explaining, and predicting a defined class of observations.

The rise of the "primacy of theory" doctrine: the example of Popper's critical rationalism The importance of theory makes it understandable why mainstream science theory tends to assume that knowledge is either theoretical or is no knowledge at all. There is, it appears, virtually no meaningful research without and beyond theoretical conjectures and claims. This notion of a *primacy of theory* in research has become so prevalent in contemporary research practice that it is almost taken for granted nowadays.

This has not always been so. At a time when *logical positivism* (also called neopositivism or logical empiricism) was the prevailing science theory, in the 1930s up to the 1950s, "data" were considered more fundamental than theory. So much so that it is fair to say that *empirical foundationalism* was one of the main tenets of logical positivism, particularly in the work of the so-called Vienna Circle, a group of science theorists that included Moritz Schlick, Otto Neurath, Rudolf Carnap, Kurt Gödel, and others. Empirical foundationalism holds that systematic observation as regulated by the methods of experimental science provides not only the starting point for constructing meaningful theoretical hypotheses but also a secure foundation for justifying their truth, and thus for claiming "objective knowledge." Truth in this view consists in the agreement ("correspondence") between the phenomena described or predicted by hypotheses and the data recorded in basic observational statements (also called protocol sentences), that is, records of empirical observations that satisfy the conditions of experimental science. The logic of research, then, is basically one of systematic data collection with a view to discovering and verifying theoretical hypotheses.

Against this foundationalist notion of science and a logic of research focused on data collection, Popper (e.g., 1972, pp. 345-347) argued that all research is theory-laden or, as he liked to say, "theory-impregnated," in the sense that all systematic observation depends on a previous theoretical frame of reference or *horizon of expectations*. It determines what phenomena we investigate, what tools and measurements we use to observe and record them, and how we interpret them. Both temporally and logically, our theoretical horizon of expectations comes prior to observing and interpreting the world (Popper, 1963, pp. 23, 41n, 387). Our competence as researchers,

then, is essentially grounded in theoretical knowledge. This is what Popper's notion of "primacy of theory" originally stands for. Its original intent was a critical one against the empirical foundationalism of the epoch.

The pretense of knowledge From today's point of view, the situation looks rather different. The importance of theory for and over data collection is hardly an issue of dispute any more. In the center of today's discussions on science and research is their role for sound policy making in the public sector and for innovation and business development in the private sector. In these contexts, one must wonder whether a theory-centered concept of research is still adequate or whether it has not long since lost its once critical function for practice. Particularly with a view to the critical pragmatist's concern for reflective research and professional practice, it seems necessary to ask whether a logic of research centered around the primacy of theorizing is entirely adequate to applied science and expertise. To put it in slightly exaggerated terms, if theorizing is all that matters, it may not matter all that much in the end.

We may be well advised to remind ourselves of Hayek's (1989) Nobel prize lecture on the *pretense of knowledge*, to which economic and social scientists so easily risk falling victim and which has caused many unsuccessful policies, for example in the fight against unemployment. As Hayek admonished us, "problems of immediate practical importance ... may follow from errors concerning abstract problems of the philosophy of science"; one such error consists in trying to understand social and economic reality, and to determine corresponding policies, "based on a superficial similarity of procedure with that of the physical sciences." (Hayek, 1989, p. 5f)

The chief point we must remember is that the great and rapid advance of the physical sciences took place in fields where it proved that explanation and prediction could be based on laws which accounted for the observed phenomena as functions of comparatively few variables – either particular facts or relative frequencies of events. This may even be the ultimate reason why we single out these realms as 'physical' in contrast to those more highly organized structures which I have here called essentially complex phenomena. There is no reason why the position must be the same in the latter as in the former fields. The difficulties which we encounter in the latter are not, as one might first suspect, difficulties about formulating theories for the explanation of the observed events – although they cause also special difficulties about testing proposed explanations and therefore about eliminating bad theories. They are due to the chief problem which arises when we apply our theories to any particular situation in the real world. ... The real difficulty, to the solution of which science has little to contribute, and which is sometimes insoluble, consists in the ascertainment of the particular facts. (Hayek, 1989, p. 6f)

The difficulty to which Hayek is referring consists in explaining and predicting the high number and complex interactions of particular circumstances that may condition the outcome of policy interventions into social and economic reality. However, the task of "*ascertaining the particular facts*" relevant for understanding any concrete part of social reality actually raises difficulties that go beyond Hayek's focus on the handling of complexity; it questions the framework of mainstream science theory in more fundamental ways than he assumed. We cannot ultimately determine the facts relevant for intervening into social reality without value judgments as to *whose* problems or concerns are to be considered relevant in the first place and what other concerns may lie beyond the reach of the intervention in question. Hardly any intervention can claim to do justice to all possible ways of seeing the situation, to all its aspects and all the concerns that different groups of people may have in regard to it, and thus to serve everyone concerned equally. The "particular facts" that we need to ascertain so as to understand a concrete situation of concern are not only numerous and interacting in complex ways, they also depend on judgments as to what ought to be achieved. Applied science is in this sense unavoidably selective; but no kind of scientific theory can tell us whose views and concerns should guide the selection of relevant facts and what kind of different social reality ought to be achieved. In earlier issues of the *Bimonthly*, we have discussed this issue as the "problem of boundary judgments." For these and other reasons, the conventional model of the natural sciences and the emphasis it puts on the role of theory cannot answer to all the methodological key issues of the applied disciplines. In the applied disciplines, we cannot simply copy the successful model of the theoretical-empirical sciences.

The problem of critically rational practice, or what "primacy of theory" has come to mean today Unfortunately, mainstream science theory has found it difficult to do justice to such insights. A telling example is provided by Popper's attempt to adapt the "primacy of theory" doctrine to the needs of the applied disciplines.* Popper deals with the problem as the question of how science can help us to choose among competing theories or models *as a basis for rational action*. The issue is known in the literature as the so-called problem of *pragmatic preference* (i.e., preference with a view to enabling rational action), as distinguished from the problem of theoretical preference

* The following sections are adapted from Ulrich (2006).

among competing claims for truth (i.e., preference with a view to promoting knowledge). It is central for Popper's understanding of rational practice and I will therefore also refer to it as the problem of *critically rational practice*, although Popper, as far as I am aware, has not used the term.

Popper tried to solve the problem by associating critically rational practice with pragmatic preference for the *best-tested* among available theories:

Every action presupposes a set of expectations; that is, of theories about the world. Which theory shall the man of action choose? Is there such a thing as a rational choice? ... Since we *have* to choose, it will be "rational" to choose the best-tested theory. This will be "rational" in the most obvious sense of the word known to me: the best-tested theory is the one which, in the light of our *critical discussion*, appears to be the best so far, and I do not know of anything more "rational" than a well-conducted critical discussion. (Popper, 1972, p. 21f)

The reader will note that Popper's argument passes over the question of how critically rational practice should handle value judgments. Rather than facing the issue, Popper's argument avoids it *as if* relying on the best-tested theory could give an agent sufficient grounds for claiming that her or his actions are rational, *regardless* of the value implications they may have for third parties.

The inadequacy of this solution is obvious. Equally obvious is the only way Popper could hope to get round the issue: namely, by redefining the meaning of "rational practice" so that it would avoid the need for value judgments. This is where Popper's *primacy of theory* argument comes into play. The argumentative strategy is to extend the notion that theory is primary in such a way that it becomes applicable not only to the relationship between theory and observation but also to the relationship between theory and *practice*.

At first glance, this may seem like an obvious extension, for it is clear that not only our descriptions of the world are conditioned by a horizon of expectations but equally are our attempts to change (improve) the world. Surely we cannot act rationally *against* our theoretical knowledge of the conditions and interdependencies that govern the section of the real-world in question? Of course not. But at a closer look, the following question poses itself: Does such relevance imply that consistency of practical proposals with theoretical knowledge is all there is to rational action? The answer is, of course, negative, *except* if we redefine "rational" action to mean *merely* instrumental action, that is, expediency (efficacy and efficiency) in using available means for reaching given ends. That is what theoretical knowledge,

if put to practical use, can achieve: it allows us to translate causal or statistical explanations of the kind “X, *given circumstances Y*, produces effect Z” into technical prescriptions of the kind “to produce effect Z, make sure X *obtains under circumstances Y*”). In one phrase, it lends itself to *instrumental reasoning*.

On the assumption that rational practice is the same as *instrumentally* rational action, “primacy of theory” has thus come to stand for a *constitutive role of theory for rational practice*. While originally the point was to draw attention to the conditioned nature of all statements of fact and claims to knowledge, it now also means that recommendations for practical action or other claims to normative rightness are rationally decidable inasmuch – and only inasmuch – as we can derive them from theoretical propositions, that is, translate them into instrumental reasoning. Hans Albert, one of Popper’s main followers in Germany, summed it all up in the triumphant creed: “Nothing is more practical than a correct theory” (Albert, 1962, p. 55; similar formulations have been attributed to Kurt Lewin, Albert Einstein, and others).

Against a mistaken "primacy of theory" over practice As we now understand, the trap lies in what this popular creed does *not* say, rather than in what it says. Like Popper’s earlier argument, Albert’s reading of the “primacy of theory” stipulation passes over the fact that for all practical purposes, the findings and conclusions of our research are not *only* theory-laden but are equally *value-laden*, in the form of normative assumptions that guide the research and determine its results. One need only think of the research questions and conventions that guide us in selecting the relevant phenomena to be examined as well as adequate ways to observe, record, and measure them, or of the claims that we then associate with the findings regarding their meaning, validity, and relevance. Critically rationalist research practice thus falls behind Kant’s (1781/1965) richer, two-dimensional concept of reason, in which reason unfolds its power both in the theoretical dimension of empirical science and in the practical (normative) dimension of ethics.

Likewise, Albert skips over the fact that the only way in which theoretical reason becomes practical is through *instrumental reasoning*. Note that both his stipulation of the practical nature of theory and Popper’s doctrine of the

primacy of theory over practice depend for their validity on the tacit assumption that the words "practical" and "practice" are to be understood in their instrumental sense only. Critically rationalist practice thus becomes blind to the other, *normative* dimension of *practical reason*. It cannot help but relegate the normative underpinnings and implications of research to a supposedly irrational, because extra-theoretical, realm of merely subjective acts of belief about which no reasonable discussion is possible; for it has no methodological means for dealing with them.

This is a fundamental misunderstanding of the nature of rational (or reasonable) practice indeed. It amounts to confusing non-theoretical and non-technical rationality with a lack of *any* kind of rationality, that is, with the impossibility of any kind of *argumentation*. In effect, this confusion then serves to immunize claims to objective knowledge or rational practice that rely on merely instrumental rationality against argumentative efforts guided by a less narrow concept of criticism (Ulrich, 1988, pp. 143-146).

It is hardly exaggerated to say that in contemporary science theory and research practice, this impoverished concept of rationality is omnipresent and continues to cause much harm. Popper's postulate of the primacy of theory has replaced Kant's older postulate of the *primacy of practice*, according to which the practical-normative dimension of reason is as essential as its theoretical-empirical dimension.

Against a misguided theoretical foundationalism The consequences are particularly grave for our contemporary understanding of applied science and *expertise*. Once we have eliminated from it the normative dimension and moreover have narrowed rational criticism down to establishing logical consistencies or inconsistencies between theoretical hypotheses and basic observational statements, the space for reflective practice becomes narrow indeed. Only those who in a concrete situation happen to bring together the necessary theoretical-instrumental knowledge and methodological skills remain fully competent to contribute. All others, including the decision-makers involved and the parties concerned, will now depend on them (the "experts") for understanding what rational action in this situation means. For the rest, as soon as they dare to have their own points of view, these will be likely to be considered merely subjective; and if they try to argue them, the experts will be quick to point out that they may not know enough about the

issue.

Ironically, Popper's original critique of empirical foundationalism thus paved the way for a new *theoretical* foundationalism. Either you are grounded in theory, or you have no grounds at all for claiming to be a competent participant! The new foundationalism here reveals its elitist and technocratic face as well as its impractical nature at once. It burdens researchers and professionals with the impossible role of having to "explain," by virtue of their advantage of theoretical and methodological expertise, to all others what in a concrete situation would be a correct understanding of "the problem" and what might be done about it. At the same time, it largely immunizes these "explanations" against the critical efforts of concerned citizens. If they do not agree with the experts' monologically presented findings and conclusions, it is their problem, as it were; for the reason can only be that they are insufficiently informed or are in any case unable to understand the reasoning of the experts. In a public referendum held in Switzerland in 1998 about the commercial release of genetically altered plants and animals into the environment, surveys found – and media discussions illustrated – that a majority of researchers in the field believed the wide-spread concerns of consumers were due to their lack of knowledge and understanding rather than any shortcomings in the arguments of proponents; the concerns of people were an expression of incompetence rather than of the existence of different valid ways of seeing the problem (Ulrich, 2000, p. 248).

Perhaps a more adequate vision for enlightened practice would be that of a living *civil society* in which active citizens and reflective professionals work together in the search for mutually acceptable solutions. How might our notions of expertise and research competence then change? And further, how might they change once we begin to ground them in the idea of a *primacy of practice in research* (Ulrich, 2001, pp. 9-11) rather than in Popper's primacy of theory over practice? I believe that in such a vision, researchers would want to cooperate with non-researchers in a way that would help ordinary people to emancipate themselves from the situation of incompetence in which professional practice tends to put them. I believe that competent researchers would then want to understand such a self-limiting and emancipatory stance as an integral aspect of their professional competence

and would also see in it an essential condition for rational practice (Ulrich, 2000, pp. 247f, 259f, 265f).

Giving practical reason a chance In conclusion, from the perspective of critical pragmatism, the "primacy of theory" doctrine of mainstream science theory is hardly a satisfactory basis for reflective research and professional practice. The underlying concepts of rationality and critique appear all too impoverished. To the critical pragmatist, reflective practice means so much more than theoretically informed practice, for *theoretical argumentation is not coextensive with the reach of rational argumentation in general*. Likewise, rational argumentation about practical matters means so much more than instrumental reasoning, for *instrumental reason is not coextensive with practical reason*.

Critical pragmatism does not accept these two great equations on which the very prevalent presumption of theoretical knowledge and reasoning in practical matters depends. Critical pragmatism's notion of the relationship of theory and practice is less theory centered. It is rooted in a two-dimensional conception of reason in which (theoretically informed) instrumental reasoning and (practically informed) normative reasoning go hand in hand and only *together* can promote rational practice. Its vision for this "together" is one in which reason and practice (or inquiry and action) would inform and inspire one another in the richest conceivable sense. This, then, is critical pragmatism's notion of *reflective practice*.

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Picture data Digital photograph taken on 11 February 2006 around 17:30 p.m., shutter speed 1/500, aperture f/4, ISO 50, focal length 13.6 mm (equivalent to 61 mm with a conventional 35 mm camera). Original resolution 4060 x 1176 pixels; current resolution 1275 x 390 pixels, compressed to 135 KB. These data refer to the complete [panorama picture](#) (click on the photograph to open the panorama).

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February afternoon at Lake Thun, Switzerland [Click for panorama](#)

„If theorizing is all that matters,
it may not matter all that much in the end.”

(From this reflection on the nature of research)

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