

# FROM BOLZANO TO WITTGENSTEIN

THE TRADITION OF AUSTRIAN PHILOSOPHY

# VON BOLZANO ZU WITTGENSTEIN

ZUR TRADITION DER ÖSTERREICHISCHEN PHILOSOPHIE

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# VON BOLZANO ZU WITTGENSTEIN

Zur Tradition der österreichischen Philosophie

Herausgegeben von  
J. C. Nyíri

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# The Austrian Element in the Philosophy of Science

J. C. NYÍRI

1 Seen from the perspective of its basic convictions and methods, Austrian philosophy of science does not seem to possess any uniformity at all. The realism of Bolzano or Boltzmann contrasts with the conventionalism and phenomenalism of Mach; the elementism of Mach contrasts with the holism of Wittgenstein; the fallibilism of Mach or Popper stands against the fundamentalism of Schlick; Popper's or Stegmüller's flair for technical terms presents a glaring contrast to the later Wittgenstein's or to Feyerabend's preference for colloquial language; the anarchism of Feyerabend is opposed to the traditionalism of the later Wittgenstein or the later Musil; the sociological point of view of Wittgenstein or Fleck is alien to the mainstream attitude of the Vienna Circle. In fact one could further diversify the picture by pointing out, for example, that there is a difference between the realism or logical objectivism of Bolzano, which postulates a realm of abstract logical entities, and the more common-sensical realist position taken for granted by Boltzmann;<sup>1</sup> or by pointing to the differences which obtain between, say, the romantic, Spenglerian-type traditionalism of Wittgenstein on the one hand and the rather more future-oriented conservatism of Musil on the other;<sup>2</sup> or by pointing to the fact that, even within the Vienna Circle, radically divergent trends made themselves felt: the ideas of Neurath, above all, and gradually even those of Carnap,<sup>3</sup> were characterized by a measure of fallibilism and holism as well as by an awareness of the sociological dimensions of truth and knowledge, in opposition to what was referred to above as the mainstream attitude of the logical positivists.

1.1 One can indeed discern as a rather strong undercurrent in the history of Austrian thought the idea that there is a proper place within the philosophy of science for sociological considerations, in the sense that at least some normative questions as to truth or falsity should really be regarded as factual questions about what is and is not accepted by the scientific community, or about what is handed down by successive generations of the same. Thus although for instance in Mach's philosophy the role of *tradition*, as regards society in general and science in particular, is depicted in an overwhelmingly negative manner, he does nevertheless concede that that which is handed down fulfils indispensable functions. In his 1883 Inaugural Address he refers to the "fixed habitudes of thought"<sup>4</sup> without which new problems will not become perceivable as such, and to the "importance and utility" of "habitual judgment" and of "prejudice". "No one could exist intellectually", he writes,

if he had to form judgments on every passing experience, instead of allowing himself to be controlled by the judgments he has already formed . . . On prejudices, that is, on habitual judgments not tested in every case to which they are applied, reposes a goodly portion of the thought and work of the natural scientist. On prejudices reposes most of the conduct of society. With the sudden disappearance of prejudice society would hopelessly dissolve.<sup>5</sup>

In a similar spirit Karl Popper writes:

What we call social life can exist only if we can know, and can have confidence, that there are things and events which must be so and cannot be otherwise.—It is here that the part played by tradition in our lives becomes understandable. We should be anxious, terrified, and frustrated, and we could not live in the social world, did it not contain a considerable amount of order, a great number of regularities to which we can adjust ourselves. The mere existence of these regularities is perhaps more impor-

tant than their peculiar merits or demerits. They are needed as regularities, and therefore handed on as traditions, whether or not they are in other respects rational or necessary or good or beautiful or what you will. There is a need for tradition in social life.<sup>6</sup>

And even Feyerabend, having once more made his peace with Wittgenstein, writes of "standards or rules" we could not use were they not "well integrated parts of a rather complex and in places quite opaque practice or tradition".<sup>7</sup> Indeed *rationality* is here regarded by Feyerabend as "one tradition among many rather than a standard to which traditions must conform".<sup>8</sup>

The list of Austrian philosophers of science more or less affected by the idea of the traditional and indeed necessarily authoritarian character of knowledge is, then, quite impressive: Ernst Mach; Carl Menger, whose *Untersuchungen über die Methode der Socialwissenschaften* (1883) extols the "subconscious wisdom" inherent in what has developed historically and organically; Robert Musil, whose essays written in the 1920s amount to a devastating criticism of his own earlier views on Mach;<sup>9</sup> Ludwig Wittgenstein;<sup>10</sup> Karl Popper; Ludwig Fleck, author of *Entstehung und Entwicklung einer wissenschaftlichen Tatsache: Einführung in die Lehre vom Denkstil und Denkkollektiv* (1935)<sup>11</sup>; F.A. von Hayek, whose *Counter-Revolution of Science*, written during the 1940s, and numerous later papers—collected, most notably, in his volume *Studies in Philosophy, Politics and Economics* (1967)—plead for a view of scientific rationality uncontaminated by utopian individualism; Paul Feyerabend; and Michael Polanyi, according to whom science is, actually, "operated by the skill of the scientist",<sup>12</sup> by a skill that can only be passed on by example: but to learn by example is

to submit to authority . . . By watching the master and emulating his efforts in the presence of his example, the apprentice unconsciously picks up the rules of the art, including those which are not explicitly known to the master himself. These hidden rules can be assimilated only by a person who surrenders himself to that extent uncritically to the imitation of another,

by a person who will "submit to tradition".<sup>13</sup>

One could in fact formulate a thesis to the effect that behind all the apparent diversity there is, within Austrian philosophy of science, a *core of traditionalism*, or at least a *continuous line* of traditionalist thinking, and one could even experiment with a comparison between the Austrian notion of "tradition" and the English notion of "consensus", as explicated in John Ziman's *Public Knowledge*.<sup>14</sup> This however is not the line I wish to pursue here. Rather than searching for unifying traits as to content and basic outlook *within* the philosophy of science as practised by Austrians, I would like to concentrate on the peculiar place of philosophy of science taken as a whole, when set against the Austrian background.

2 For there indeed *is* an Austrian element in the philosophy of science in the sense that the dimensions of the philosophy of science in Austria as compared to the dimensions of science proper, the predominance of this discipline within Austrian philosophy, and the presence of Austrians within this discipline worldwide, are no less than staggering.

2.1 The inventory of Austrian philosophers of science, even if only the leading representatives are listed, is remarkably large. In a rough chronological order, one would enumerate Bernard Bolzano, Ernst Mach, Carl Menger, Ludwig Boltzmann, Alois Höfler, Edmund Husserl,<sup>15</sup> Robert Musil, Ludwig Wittgenstein, Hans Hahn, Otto Neurath, Herbert Feigl, Philipp Frank, Karl Popper, Ludwik Fleck,<sup>16</sup> F.A. von Hayek, Richard von Mises, Michael Polanyi, and Paul Feyerabend. Not counted here are Brentano, Schlick and Carnap because of their German origin; Meinong because his interest in the philosophy of science was perhaps merely tangential; Zilsel, Waismann, V. Kraft, B. von Juhos and W. Stegmüller because the significance of their contributions is still in doubt. By comparison, a list of *German* philosophers of science would include at best no more than five to eight names—Ostwald, Hertz, Dingler, Reichenbach, Hempel, and possibly the three elective Austrians mentioned above. This contrast becomes especially intriguing if one recalls that in science proper Germany had always an

absolute lead over Austria. Comparing, for instance, the numbers of Nobel Prize winning scientists, one finds that by 1906/07—the time when Philipp Frank, Hans Hahn and Otto Neurath started their fateful routine of meeting weekly in a Viennese coffee house—the figure for Germans was *seven*, and that for Austrians *zero*. By 1921, for which year Einstein won his Nobel Prize, and in which year he gave his celebrated Vienna public lecture, “in an enormous concert hall before an audience of some three thousand people”,<sup>17</sup> the figures were *twenty* for Germany and *one* for Austria, the Vienna-born Hungarian Robert Bárány having won the Nobel Prize for medicine in 1914.<sup>18</sup>

**2.2** Philosophy of science very soon became *the* dominant branch of philosophy in Austria, a state of affairs having no parallel in Germany, England, or France. There is no really first-rate Austrian philosopher who did not contribute to this discipline, and the major figures in Austrian philosophy are practically all of them major figures in the philosophy of science, too. Or, as Rudolf Haller has put it: Austrian philosophy “appears . . . as a hidden branch of English empiricism, with the eventual reduction of philosophy to one of its disciplines: the theory of science.”<sup>19</sup>

**2.3** Philosophy of science was not, of course, created by Austrians. From Whewell, J. S. Mill, Poincaré, Duhem and Russell to Toulmin and Kuhn, the discipline has a distinguished English, French and American history. But the Austrian presence and indeed influence has become enormous. There is the school of Popper. There is Feyerabend. And there is, most importantly, the impact of Wittgenstein. This latter is obvious in Toulmin’s case; conspicuous in Hansen’s;<sup>20</sup> very important in that of Sellars;<sup>21</sup> and essential in Kuhn’s, whose other main source of inspiration was of course Ludwik Fleck.<sup>22</sup>

**3** Now in attempting to offer an explanation for the preeminence of the philosophy of science in Austria one must be conscious of the fact that, as with all historical hypotheses, the suggestions made here are of a necessarily tentative character. They are designed merely to open up what may be plausible perspectives, and do not amount to propositions capable of definite verification. Three such—complementary—perspectives will be put forward.

**3.1** The main characteristics of Austrian philosophy as such bear striking testimony to the fact that the emergence of an autonomous middle class within the Habsburg Monarchy was belated and incomplete. The middle-class values of individual rationality and of the sovereign, self-determining personal subject were neither taken for granted in Austrian thought, nor made the object of conscious hypostatization. Thus both the isolated epistemological subject of Descartes and Locke and the pure ego of Kant failed to play a role within the borders of the Empire. And the Austrian aversion to the notion of a metaphysical self helped from the very start to direct epistemological attention towards *intersubjective cognitive processes*, and not least towards the phenomenon of science.

**3.2** In peripheral Austria the development of natural science necessarily lagged behind that of the more advanced countries to the West—in particular that of Imperial Germany—creating a vacuum which the *theory* of a practice so attractively pursued elsewhere could then fill. The early career of Ernst Mach, whose example for, and influence upon, subsequent generations of Austrians could hardly be overestimated, is itself paradigmatic. He entered the University of Vienna in 1855, and was not at all happy there. As he wrote to Hugo Dingler in retrospect:

I never had a teacher of importance outside of the great dead classical authors, for my student days preceded almost all of the reforms of the Austrian universities, which had been allowed by Kaiser Franz to go to the dogs. [But] I had no money to attend a German University . . .<sup>23</sup>

After having received his doctorate in 1860, he would have liked to study at Königsberg, under Franz Neumann, who had done work on the dynamic theory of light and mathematical research relating to the induction of electric currents. But Mach, as Blackmore puts it,

simply lacked the financial means, nor could he even afford to buy the equipment necessary to carry out satisfactory physical experiments in Vienna. Thus financial pressure drove him in two directions: first, to introduce popular, remunerative lectures, and second, to find a way to carry out inexpensive laboratory experiments.<sup>24</sup>

Such experiments, Mach found, were possible in the application of physics to physiology and psychology. Here, to quote Blackmore again, "he was able to make some progress, even with the most primitive instruments and apparatus or with none at all".<sup>25</sup> And if psychophysics was cheap, philosophy was of course even cheaper. Mach's 1871 lecture "Die Geschichte und die Wurzel des Satzes von der Erhaltung der Arbeit"<sup>26</sup> already contains all the main—radical but facile—philosophical ideas of his later years. "Das Eine wollen wir festhalten", Mach stressed,

dass es bei der Naturforschung nur auf die Erkenntnis des Zusammenhanges der Erscheinungen ankommt. Was wir hinter den Erscheinungen uns vorstellen, existiert *eben nur* in unserem Verstande, hat für uns nur den Wert einer Gedächtnishandhabe oder Formel, deren Gestalt, weil sie willkürlich und gleichgültig ist, sich sehr leicht mit unserem Kulturstandpunkt ändert.<sup>27</sup>

Karl Popper never shared Mach's conventionalism; but he did share with him the experience of finding himself in the close vicinity of science at its greatest and of being caught up in wonder at its possibilities, without however really being able to partake in it. He was awestruck by lectures in mathematics and theoretical physics at Vienna University,<sup>28</sup> but what absolutely dazzled him was the aura of Einstein's work. Here, Popper felt, was the true scientific attitude:

Einstein was looking for crucial experiments whose agreement with his predictions would by no means establish his theory; while a disagreement, as he was the first to stress, would show his theory to be untenable.<sup>29</sup>

When in 1921 Einstein gave his Vienna public lecture referred to above, Popper, too, went to listen to him; but, as he puts it in retrospect, "this thing was quite beyond my understanding . . . I remember only that I was dazed."<sup>30</sup> He has not been the only one. "The public was", as Philipp Frank describes the lecture, "in a remarkably excited state, the kind of mental state in which it no longer matters what one understands as long as one is in the immediate neighbourhood of a place where miracles are happening."<sup>31</sup>

3.3 Philosophy of science has an *ideological character* which science lacks. The picture of scientific detachment drawn by Max Weber in his "Wissenschaft als Beruf" (1919)<sup>32</sup> is surely an idealization, yet it would still be unheard-of within science proper to attach political labels to this or that position, whereas such labeling has always been widespread in the philosophy of science. To cite some current examples: Wittgenstein's philosophy has been called "conservative" by Prague-educated Ernest Gellner,<sup>33</sup> while both Wittgenstein and T. S. Kuhn have been labeled "undemocratic", "authoritarian", and "elitist" by the Hungarian Imre Lakatos, who maintains on the other hand that his *own* philosophy of science, like Popper's, is "democratic", whereas that of Feyerabend is of course "anarchistic".<sup>34</sup> Some of these labels might be unhappily chosen. But the strong connection between political arguments on the one hand, and arguments pertaining to the theory of science on the other, is clear: it was already conspicuous in the writings of Mach and was indeed there still earlier in the work of Bolzano. This ideological character of the philosophy of science must clearly have had special appeal in a society facing the political dilemmas of relative backwardness.

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#### ENDNOTES

<sup>1</sup> "Ich bin der Meinung", wrote Boltzmann, "daß die Aufgabe der Theorie in der Konstruktion eines rein in uns existierenden Abbildes der Außenwelt besteht . . . Es ist ein eigentümlicher Trieb des menschlichen Geistes, sich ein solches Abbild zu schaffen und es der Außenwelt immer mehr und mehr anzupassen." Ludw. Boltzmann, *Populäre Schriften* (Leipzig 1905), p. 77.

- <sup>2</sup> Cf. e.g. my papers "Musil und der Begriff der Tradition", in Josef and Johann Strutz (eds.), *Robert Musil—Theater, Bildung, Kritik* (München—Salzburg 1985), pp. 143–152, and "Musil und Wittgenstein", *Literatur und Kritik* 113 (1977/4), pp. 167–179.
- <sup>3</sup> As Rudolf Haller points out, Neurath stressed as early as 1913 that all observation statements are theory-laden, and in fact by the mid-thirties had arrived at views strikingly parallel to those of Kuhn and Feyerabend, cf. Haller, "Zwei Arten der Erfahrungsbegründung", in R. Haller (ed.), *Schlick und Neurath—Ein Symposium* (Amsterdam 1982), pp. 26 and 33. In the same volume Friedrich Stadler speaks about Neurath's "wissenschaftstheoretische[r] Holismus, Fallibilismus und . . . pragmatisch-soziologisch gedachte[r] Konventionalismus . . . , der auf die sozialen Bedingungen wissenschaftlicher Kommunikation weist und die Notwendigkeit einer Synopsis von internalistischer und externalistischer Betrachtungsweise vor Kuhns und Feyerabends Arbeiten signalisiert" (p. 458), while Francesco Barone quotes a passage from C. G. Hempel, who in 1935, "referring to a previous analogous statement of Carnap, [had] stated: 'The system of protocol statements which we call true, and to which we refer in everyday life and science, may only be characterized by the historical fact, that it is the system which is actually adopted by mankind, and especially by the scientists of our cultural circle . . .'" (p. 335).
- <sup>4</sup> Mach, Ernst, *Popular Scientific Lectures* (1895), transl. by Thomas J. McCormack (La Salle, Ill. 1943), p. 227.
- <sup>5</sup> Mach (1943), p. 232.
- <sup>6</sup> Popper, Karl R., *Conjectures and Refutations* (London 1972), pp. 130f. From the paper "Towards a Rational Theory of Tradition" (1948).
- <sup>7</sup> Feyerabend, Paul, *Science in a Free Society* (1978). London 1982, p. 26.
- <sup>8</sup> Feyerabend (1982), p. 7.
- <sup>9</sup> Musil's doctoral dissertation of 1908, *Beitrag zur Beurteilung der Lehren Machs*, is now available in English under the title *On Mach's Theories*, introduced by G. H. von Wright (München 1982). Of his essays, it seems that only one has been translated, "The German Personality as a Symptom" (1923), in J. C. Nyiri (ed.), *Austrian Philosophy: Studies and Texts* (München 1981).
- <sup>10</sup> I have attempted to articulate the traditionalist elements of Wittgenstein's later epistemology in my papers "Wittgenstein's New Traditionalism", *Acta Philosophica Fennica* 28/1–3 (1976), pp. 503–512, and "Wittgenstein 1929–1931: Die Rückkehr", *KODIKAS/CODE—Ars Semeiotica* 4–5/2 (1982), pp. 115–136.
- <sup>11</sup> Translated into English under the title *Genesis and Development of a Scientific Fact* (Chicago 1979).
- <sup>12</sup> Polanyi, Michael, *Personal Knowledge: Towards a Post-Critical Philosophy* (1958). London 1983, p. 49. It was of course in England that Polanyi wrote his philosophical works, but he was actually born in Budapest in 1891, and the milieu in which he grew up was so markedly Viennese that it does not seem improper to regard him, in the present context, as an Austrian philosopher of science. Polanyi's father, whose name was still Pollacsek, came from the Carpathian region, and his mother, Cecile Wohl, from a Lithuanian rabbinical family. During the 1880s they lived in Vienna, Michael's brother Karl was born there, and the family's ties with the culture of that town remained strong for decades thereafter.
- <sup>13</sup> Polanyi (1983), p. 53.
- <sup>14</sup> Cambridge 1968.
- <sup>15</sup> Husserl's early work *Philosophie der Arithmetik* (1891) should doubtlessly be regarded as an Austrian contribution to the philosophy of science, and the *Logische Untersuchungen* of 1900/01 still contain characteristically Austrian elements.
- <sup>16</sup> Fleck was born into a Lemberg Jewish family in 1896. To see in him a Pole *sans phrase*, as the editors of the 1980 German reprint of his major work seem to do, is an utter misunderstanding of what Austria was, or of what it was to be an Austrian, at the turn of the century.
- <sup>17</sup> Frank, Philipp, *Einstein: His Life and Times* (London 1948), p. 214.
- <sup>18</sup> Later the margin became less wide, the figures being 56 to 13 by 1970, and here one should of course take into account the differences in population. From our present point of view, however, it is only the earlier decades that are of interest, for it was then that the Austrian paradigm in the philosophy of science became established.
- <sup>19</sup> Haller, Rudolf, "Österreichische Philosophie", *Conceptus* 11/28–30 (1977), p. 66.
- <sup>20</sup> Witness his *Patterns of Discovery* (Cambridge 1965).
- <sup>21</sup> This becomes especially clear from his early essay "Some Reflections on Language Games", *Philosophy of Science* 21 (1954).
- <sup>22</sup> Cf. Kuhn's "Preface" to his *The Structure of Scientific Revolutions* (1962), Chicago 1964, p. viii; see also his "Foreword" to Fleck (1979).
- <sup>23</sup> From a letter dated March 16, 1911. Quoted by J. T. Blackmore, *Ernst Mach: His Work, Life, and Influence* (Berkeley 1972), p. 13.
- <sup>24</sup> Blackmore (1972), p. 14. —Reflecting upon the achievements of science in Germany after World War I, and upon the "abominable economic conditions" there, Wolfram Fischer writes: "That highest standards could be kept in spite of such relative poverty throws some doubts on the hypothesis that there is a necessary direct link between ample funding of basic research and its quality." ("The Role of Science and Technology in the Economic Development of Modern Germany", in William

Beranek, Jr. and Gustav Ranis, (eds.), *Science, Technology and Economic Development* (New York 1978), p. 100. But as Fischer himself writes, the German situation was peculiar, since from the time of the Prussian university reforms promulgated mainly by Wilhelm von Humboldt there had existed there a powerful established tradition of research and teaching—a tradition which was then subsequently destroyed in Nazi Germany.

<sup>25</sup> Blackmore (1972), p. 15.

<sup>26</sup> First published Prague 1872, 2nd ed. Leipzig 1909.

<sup>27</sup> Mach (1909), pp. 25f.

<sup>28</sup> Karl Popper, *Unended Quest: An Intellectual Autobiography*, rev. ed. (London 1976), pp. 39f., cf. also p. 54.

<sup>29</sup> Popper (1976), p.38.

<sup>30</sup> Popper (1976), p.37.

<sup>31</sup> Frank (1948), p. 214. — By 1945, Nobel Prizes had been given to the Austrian physicists Schrödinger, Hess and W. Pauli. But one can still hear an undertone of frustration when e.g. the essayist Paul Kruntorad writes: "Die Kernspaltung, die der deutsche Physiker Otto Hahn zum ersten Mal experimentell durchgeführt hat, haben Lise Meitner und ihr Cousin Otto Robert Frisch beschrieben und erst dabei den Begriff geprägt." (P. Kruntorad, (ed.), *A.E.I.O.U.* ["Austria est in orbi ubique"], Wien 1985, p. 9.)

<sup>32</sup> "'Persönlichkeit' auf wissenschaftlichem Gebiet hat nur der, der *rein der Sache* dient", wrote Weber. A university teacher is responsible and upright only to the extent that he realizes that "Tatsachenfeststellung, Feststellung mathematischer oder logischer Sachverhalte oder der inneren Struktur von Kulturgütern einerseits, und andererseits die Beantwortung der Frage nach dem Wert der Kultur und ihrer einzelnen Inhalte und danach: wie man innerhalb der Kulturgemeinschaft und der politischen Verbände *handeln* solle, — daß dies beides ganz und gar *heterogene* Probleme sind." Max Weber, *Gesammelte Aufsätze zur Wissenschaftslehre* (Tübingen 1968), pp. 591 and 601f.

<sup>33</sup> See his *Words and Things: A Critical Account of Linguistic Philosophy and a Study in Ideology* (London 1959), esp. pp. 196ff. and 214f.

<sup>34</sup> See his "Understanding Toulmin", in Imre Lakatos, *Philosophical Papers* (Cambridge 1978), vol. 2, pp. 225ff.

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