Sie nannten sich der Wiener Kreis

Exaktes Denken am Rand der Untergangs

K.Sigmund

July 22-27, 2017

This is a tale, a story of a movement, its birth, its rise, its decline and its death. The first impression is one of a coffee-table book. The paragraphs are short, the language is simple and straightforward, and there are a lot of illustrations. A book to savor without undue intellectual effort, yet it grows with reading, and being heavy on so called human interest it grips you. The last pages of customary (and obligatory?) acknowledgments explains the first impression. The book actually grew out of an exhibition, so it should be thought of as an extended catalogue, the text initially seen as complementing and explaining the exhibits, and then gradually coming on its own.

The story begins with Mach and Boltzmann. Two physicists, one experimental, the other theoretical, both with a keen interest in philosophy. This was not unusual in the 19th century, and before that rather the norm than the exception. Mach presented a radical view in which direct sense impressions were the basics, while theories just constructions of the human mind. He was a so called instrumentalist along with his French colleague the mathematician and mathematical physicist Poincaré, who famously claimed that the question of whether space was Euclidean or not, was not a physical one, but one of convention and convenience (depending on what you decided to be a straight line). Mach notoriously claimed that atoms did not exist, that they were but a figment of the physicists imagination, just as forces were constructs. As Karl Popper noted, his approach did not differ significantly from that of the classical idealists such as Berkeley, with the possible exception, that the latter standpoint was more thought out. Ultimately the attitude of Mach led to solipsism, a radical and logical conclusion. While Mach was struck down with ill-health, Boltzmann took over his duties in Vienna, including the philosophical and developed his own ideas.

Mach and Boltzmann set a precedent. Philosophy should not be engaged in by wooly humanists such as Heidegger and his likes, but by level-headed men with a solid scientific background, preferably in physics. Philosophy should be science, and its foremost duty was to rid itself of old garbage, such as metaphysics, in fact the Death to Metaphysics became a unifying rallying cry. Intimately connected with this was the idea that classical philosophy was engaged in 'Scheinprobleme' meaning irrelevancies resulting from the seductiveness of language[1]. The purpose of the new philosophy, the first truly significant advance since Aristotle, was to single out and identify the truly meaningful statements and to explain their meaning, that being the true purpose of philosophy, not to establish facts, as in the sciences. And the meaning of a sentence became identified with the method to be used in

---

[1] Russell remarked that concrete and abstract nouns are grammatically indistinguishable, something which has led to a hoist of confusion in philosophical thinking.

its verification.

The philosophy was both idealistic and materialistic. Idealistic in its approach, materialistic in its attitude. It fitted the 'Zeitgeist' perfectly, but was as such resented by the classical philosophers, mainly the Germans, and was in effect British empiricism planted on continental soil, thus part of the tradition to be known as Analytic Philosophy[2]. It has been disparaged as 'Logical Empiricism' or 'Logical Positivism' indicating a narrowness of purpose unworthy of the loftiness of elevated human thought as cultivated in philosophy[3].

There are four names which are central to the movement, which started as an informal discussion club among likeminded young men, later to publish a manifesto, not unlike a political movement, and formalizing its random meetings into a ritual, and giving it all a name, - the Vienna circle - to give pleasant associations to Vienna walzes and similar manifestations of the Habsburg empire. The central characters of the book are Moritz Schlick, a favorite student of Max Planck, who abandoned a promising career in physics for philosophy already as a young man, Otto Neurath, who actually was more of a social scientist, and politically very active on the Left[4], the mathematician Hans Hahn and the erstwhile physicist Rudolf Carnap. Schlick became the formal leader of the movement, but a leader more in the sense of the head of an academic department, (who clearly cannot expect obedience from his colleagues), than a traditional one who commands his followers. The members of the circle were indeed strong personalities, and Moritz authority rested on his ability to keep warring fractions in check, to provide compromises and to effect reconciliations. Indeed without him there would have been no formal circle at all. Neurath played the role of the 'enfant terrble' more outspoken than anyone else and whose political engagements at the end of the First World War had earned him imprisonment in Germany out of which he had only been extracted through the intervention of Austrian authorities and the support of the Socialist leader Otto Bauer. Academically unemployed he was engaged in a museum devoted to visual display and information aimed at a general audience. One of his lasting contributions was in the championship of pictograms, universally understandable icons, which he saw as the way of the future. Hahn a brilliant mathematician[5] provided a solid core of indisputable competence, while Carnap was the work-horse of the movement, providing a steady stream of publications, and the only one of the founding fathers to survive well into postwar years[6]. There is much gossip to convey about the private lives of those individuals and how those intersected with each other.

---

[2] one of its founding fathers was indeed a German - Gottfred Frege, who only gets marginal notice in the book.

[3] In Aldous Huxley's 'Point, Counterpoint' one of the conceited characters suddenly realizes in old age that he has been a philosopher all along, unaware that he had possessed wings.

[4] And the most militant of them all, especially in his almost monomanic opposition to anything that smelled of metaphysics.

[5] Beginning students encounter him at first through the Hahn-Banach theorem, a rather abstract theorem in the emerging discipline of Functional Analysis based on the Axiom of Choice. As a young man I was skeptical, if such an ostensibly hard subject resorted to such abstract principles, how could it have any tangible physical consequences. Would bridges collapse if the Axiom of Choice was not true?

[6] Both Schlick and Hahn succumbed in very different ways already in the mid 30's, Neurath barely survived the war until he was felled by a stroke, while Carnap survived until 1970.

Neurath did marry at a time the blind sister Olga of Hahn, as well as having a variety of affairs, fashionable at the time (as in so many other times).

But a movement does not arise in a vacuum, apart from the examples of Mach and Boltzmann, there were other good fairies present at its incipiency. The most famous of them all is undeniably Einstein, whose theories at the time made a splash, not only in scientific circles, but whose more popular lectures drew a mass audience and excited the literati. Einstein was very appreciative of Schlick, and in particular praised a book the latter had written on Relativity theory on its precision and clarity omitting nothing crucial, including nothing irrelevant. But also Bertrand Russell was a role model for them for his efforts to base mathematics on logic and the implications that all knowledge can ultimately be reduced to no nonsense logic, the epitome of clear and unsentimental thinking. Mathematics had passed through a crisis at the turn of the century necessitating a reconsideration of its foundations. The crisis was never really resolved, in fact it eventually petered out, and its effect on mainstream mathematics turned out to be rather marginal after all[7], but at the time, mathematics intersected with philosophy and demanded attention from the general intellectuals[8], It all started with Cantor who was the first mathematician, and hence the first ever, who considered infinity seriously as an ontological entity, not just a potential, and for all intents and purposes a metaphysical entity. He made a startling discovery, namely that there is a hierarchy of infinities, that infinity could be so huge as being inexhaustible by counting. His success was due to his subjecting the notion to a hard and precise methodology, his cutting razor being what is known as the Cantor diagonal principle, a daring self-referential procedure, celebrating free will[9]. This idea, with roots in the ancient Liar's paradox, lies at the heart of all advances in modern logic. Now that the reals are uncountable may be taken as a convenient metaphysical fact, without it modern measure theory with countable additivity, would not be possible. To manipulate (countable) infinity in a seemingly tangible and unsentimentally mechanical way which the modern mathematician does all the time[10] necessitates a context which remains beyond all those manipulations, a kind of metaphysical infinity playing the same role towards countable

---

[7] One may argue that the mathematical philosopher C.S. Pierce had a point when he claimed that the integers were more fundamental than logic, as well as remarking that mathematics is not a science of necessary consequences but one which draws the necessary consequences.

[8] It is possible of course to be a philosopher ignorant and uninterested in mathematics, but all serious classical philosophers were versant in mathematics, even such a political scientist as Hobbes, and always awarded it a central role impossible to ignore.

[9] Time travel runs into no logical quandrums if there is no free will, because than the forbidden cannot be done, such as killing your mother while she is a baby, an impulse less motivated by cruelty than intellectual mischief. The whole thing is also connected with whether the past injects into the future, i.e. whether any act leaves a trace, enabling you to faithfully reconstruct the past from the present, the ultimate ambition of all forensic endeavors such as paleontology or a crime investigation. However, it is psychologically easier to entertain the notion that an effect may have many causes, than that a cause may not have a unique effect. If the former is true, one may conceive of certain limited time-travels, where the distortion of the past is just local, a further elaboration of which a mere footnote does not provide enough room to display.

[10] If you want to cover the rational numbers with a finite number of intervals, the union will at most

(manipulative) infinities, as classical (countable) infinity does with regards to finite processes. But there is a free indomitable will which cannot refrain from submitting the 'new' infinity to the same treatment. The result is that there is an infinite hierarchy of infinities, Cantor proving in effect that the so called power set of each set had higher cardinality then the set itself. But the set of everything, or at least the set of all sets, cannot be surpassed, even by its power set? If you look at Cantors simple proof, you immediately come up with the so called Russell paradox. Whether this was the way Russell discovered it is of course a point of pure speculation, but I personally think that it is likely[11]. Now the infinities of infinities to which Cantor introduced us may be a delight among the logicians, but to a mainstream mathematician they are of dubious and superficial interest. It is one thing to handle countable infinite sets in a mechanical way, quite another one to deal with those of higher cardinality. In fact the unfeasibility of the latter in any true sense results in the existence of countable models, even for the reals, the apparent contradiction, pointed out by Skolem, hinges on the nature of formalization, and in this case the difference between the internal and external (metaphysical) point of view. At the time there were different schools of mathematics. The logical, as proposed by Frege and Russell, wanting to reduce mathematics to logic, and the closely connected formalist championed by Hilbert in his ambition to mathematically prove the consistency of mathematics[12]. Then there was the classical Platonist approach, recently described by the Russian mathematician Yuri Manin as intellectually indefensible but psychologically inescapable, and the strange concoction proposed by Brouwer, and termed intuitionistic, and as such opposed by Hilbert as too timid. Now there are of course large overlaps between them, the intuitionistic characterized among them all by putting human inventiveness at the center of mathematical ontology. The most promising being Hilbert's, and in effect the magnus opus of Russell and his mentor and co-author Whitehead, can be thought of an attempt at formalization of basic mathematics. On the scene enters Gödel, a young high-strung neurotic, and shows in a clever way the futility of Hilbert's program. The latter made an important distinction between a formal system and its internal language, and the meta-language with which we can speak of the system. Thus a formal system may not describe anything at all, but as a formal system it becomes an entity in the world, a concrete object in fact [13], and one can

---

exclude a finite number of points and in effect be far too indiscriminating, but if you are allowed an infinite number, the union can be of arbitrarily small (but strictly positive) measure, a typical feat done everyday by a mathematician.

[11]   A close study of his correspondences and left over notes may shed some clarification, but I doubt it.

[12]   To classify Hilbert, the most important mathematician of the first half of the 20th century, and one of the most influential of all times, although lacking the flamboyance of genius associated with a Gauss, (or in its more romantic manifestations as in Abel and Galois), as a formalist, is an egregious simplification. Hilbert was not a formalist by temperament but took a purely instrumental attitude towards it.

[13]   Chess pieces may have any form, it is irrelevant, what is relevant is the way they move, which constitute the real essence of the game. While the object themselves can be represented by physical objects, the moves themselves cannot so be represented, but may need auxiliary props such as chess pieces to be manifested. Thus paradoxically what cannot be physically represented, is the only thing which has real existence as far as the game is concerned. Abstract entities can in a sense be more tangible than concrete ones!

ask hard questions about it, as such whether it is consistent or not. What Gödel did was to almost effect an imbedding of the meta language into the formal system itself and draw the necessary conclusions. It is thus a mathematical proof of a philosophical statement, maybe the only one there is! Gödel's proof involves a clear notion of what a formal system entails, a clever way of using Pierce dictum that the integers are more fundamental than logic [14] and inviting the reader to in his mind go through an infinite process. Much hype has been made of Gödel's theorem, but it is only applicable to formal systems. There is something beyond formal systems, because if everything could be formalized, we could by virtue of it go beyond it, just as we can by the very notion of a set of all sets, go beyond it. Formalization lies at the very heart of the Vienna Circle, and in fact constituted its very methodology, as manifested by the painstaking works of Carnap, thus Gödel would be a welcome, and in fact necessary addition to the circle. Gödel did participate, but like many of the mathematicians he preferred to stay silent during the more obtuse discussions and soon grew tired of it all. Nevertheless Gödel plays an important part of the book, and while Gödel in the end had little influence on mainstream mathematics, he set about the revolution of logic, which culminated in the 30's (its golden decade) with works by a whole hoist of logicians, Turing retroactively maybe most prominent by them, which when the appropriate hardware would emerge, led to the digital era, in which we now live, developments very much in the spirit of the Vienna Circle. Russell thought of mathematics as a string of tautologies, and the mathematician Hahn expressed similar ideas, when he in the spirit of Laplace announced that to an all encompassing intelligence, all of mathematics would be instantly appropriated and hence has no need for it[15].

There being obvious shortcomings in so called naive set theory, as pointed out by Russell, there was a need to present stricter axioms to bypass such anomalies. Zermelo presented such an attempt, later modified by Fraenkel, and now known as the Zermelo-Fraenkel axioms. The drawbacks of such an axiomatization is that it appears too *ad hoc*, more like setting up traffic regulations than to isolate the essential properties, as in the axioms and postulates of Euclid. Certain things have to be avoided, such as self-references, in particular sets which contain themselves as elements. In many ways those regulations are counter-intuitive, there are many natural things we would like to include. Thus we are up against the possibility of a variety of axiomatization, the Axiom of Choice, becomes indeed an Axiom of choice. Gödel who was a pioneer in such matters revealed at the end of his career his true Platonic leanings. Among the most intriguing of his claims, is his idea that there are out there some natural axioms for sets, the trouble being we have not yet discovered them. In such a canonical, Platonic set theory, the Axiom of Choice is no longer one of choice, but either true or false, just as the elusive continuum hypothesis. The state where things could be true or not, depending on your preference, is of course in the spirit of post-modernism [16] which was anathema to one of Gödel's temperament.

On may remark in passing that mathematics seldom makes it into literature, and

---

[14] One may think of modern logic as part of applied mathematics, only when mathematics entered logic non-trivially did exciting things happen.

[15] Ayer, in his classical book, in which he champions Logical Positivism, expresses similar sentiments.

[16] To be fair: The independence of an axiom from others is a true or false fact, the truth of the axiom as such, is a meaningless statement.

when it does it is mainly its philosophical aspect. While most of mathematics is beyond reach of the lay public because of its technicality, the foundations of mathematics is far more accessible to the general curious mind. Among such minds one can claim a number of authors in Vienna at the time, proponents of the general Zeitgeist. One obvious such example is Musil, who had some mathematical education and actually in his debut novel ('Die Verwirrungen des Zöglings Törless') delves into certain aspects of the mystery of mathematics, especially the manipulation of complex numbers, but also if mathematics is not reliable beyond doubt, what is? A less obvious one is Perutz, who at the time had far more commercial success than Musil, much to the resentment of the latter.

But the Vienna Circle was also subjected to digressions, and hence diversions from its true path, which in the end did the movement harm. I am of course thinking of Wittgenstein, the most overrated of all modern philosophers[17]. For some reasons Wittgenstein like a con-man bedazzled the Cambridge school as well as the Vienna circlists, admittedly with crucial exceptions. His Tractatus written in an oracular style exerted a seductive spell on the more sentimental aspects of clear minds. Schlick was quite taken by him, while Carnap and Neurath ended up being far less enamored. With Wittgenstein philosophy became a kind of linguistic, as if thought, and hence the conception of the world was just a question of language. This unfortunate development involved analytic philosophy as a whole, as Wittgenstein being a professor at Cambridge, exercised a decisive influence on British philosophy as well. The emphasis on language, whether human or formal, brought about a trivialization of philosophy rendering it into a rather petty academic subject involved with contrived linguistic or rather simple-minded mathematical details, no longer attracting the best brains. As to Wittgenstein, he was confused. While Socrates prided himself on his ignorance, Wittgenstein might justifiably have prided himself on his confusion. Another unemployed academic of obvious, if not necessarily appreciated, brilliance, was Wainsmann, who was given the hardly lucrative task of writing down Wittgensteins thoughts and make them more accessible. It was not very satisfying either, as Wittgenstein the whole time changed his thoughts, having the bad habit of always rethinking them and hence distorting them. His 'Boswell' were made to do innumerable rewrites and in the end it came to nothing as Wittgenstein decided to do it all by himself after all. His 'Philosophische Untersuchungen' was eventually published posthumously, with the inevitable unauthorized editing such endeavors invariably involve, likewise extracts were made out of the Nachlaß of Wainsmann, to make his efforts less vain. Wittgenstein does not come across as a very sympathetic figure, although a romantic one, with still a large following. He was always contemptuous of those who took him seriously and advised them, wisely one is tempted to conclude, to drop out of philosophy. Yet for all his shortcomings he is superior to his admirers and emulators.

While most of the members of the Vienna Circle and its periphery were born and came of age during the Habsburg time, their activities took place during the 20's and (early) 30's, when Austria, that stump of an Empire, which had in vain sought unification with the Greater Germany after the end of the First World War, was in definite decline soon about to

---

[17] If you include the philosophical fringe, including Heidegger and French structuralists, the competition becomes too tough even for someone like Wittgenstein.

fall freely[18]. But it would soon become even worse. Still academic life was vibrant as noted, and Germany was still a center of science, in fact still unsurpassed by any other nation. Vienna might have been on its periphery yet it provided in many ways an alternative to traditional German academics. The philosophy of the Vienna Circle was far more modern than what still prevailed in Germany, and there were also other interesting developments in Vienna, such as its school of economics with roots back into the 19th century. In fact Karl Menger, a young brilliant mathematician associated to the Vienna spirit, was the son of one of the founders - Carl Menger - of the school. While mathematics were making inroads into economics, that school held out, taking a more historical and social approach, one of its prominent disciples being Hayek. Oskar Morgenstern, was another case, who differed from his colleagues in his desire to make the discipline more mathematical and found in Menger a willing mathematical mentor, and thus became marginally involved with the circle. Of course one of the charms of learning about its story is how the paths of the members and associates crossed, the intellectual world still being small and less specialized than today. Everyone seemed to know everyone else, just as in a small village. Morgenstern would with Einstein and Gödel eventually emigrate to the Institute (in the case of the first two rather smoothly, but with Gödel in a contorted way bespeaking his unworldliness and concomitant ineptness in everyday affairs, providing a delightful occasion for yet another human interest digression in the book) and become friends of sorts. In retrospect all the people seem so distinguished and so as a matter of course, but even if the academic milieu was small, most people are not remembered by posterity, there were a proletariat so to speak of Privatlehrte, who eked out a precarious living, good enough (or even much more) to write a thesis and earn the title of a doctor, but not remarkable enough (or lucky enough) to get an academic position. Some of those people, such as Wainsmann, we have already met, others, playing more ominous roles we are about to meet.

The political situation in Austria went from bad to much worse. There was severe civil unrest and it came to armed clashes in the streets, including those of failed putsches. The country was on the verge of a civil war. There emerged the strange case of Dolfuß. By all accounts, yet another of those charismatic dictators, who emerged in the interwar period. Dolfuss was head of the Christian party with marked conservative and Catholic values, and to which the ambitions of the Vienna Circle were anathema. It provided a kind of counterpoint to the emerging NSDAP which with the access of Hitler to the Chancellorship became also a serious external threat. Dolfuss acquired dictatorial powers, emasculated the Parliament of all political influence and formed the so called Vaterländische Front with its own version of a cross. Schlick welcomed the development, at least as the least evil of prevalent alternatives. Dolfuss was soon killed during an aborted Putsch by the Nazis, and was succeeded by Schuschnigg, who in vain tried to keep Austria independent, by, as his predecessor had done, appealing to Mussolini as its protector. With the rapprochement between Hitler and Mussolini in 1938 it all collapsed and Austria was quickly annexed, to the satisfaction of a relatively large part of the population. What had taken Germany six years as to repressive measures, particularly against the Jews, was more or less immediately accomplished in Austria leaving the concerned people with no illusions. Emigrate or die

---

[18] In his autobiography 'Die Welt von Gestern', Stefan Zweig gives a vivid account of returning to the reconstituted Austria after the war, and the prevalent poverty.

suddenly became the stark choices to consider. By that time the Vienna Circle was dead, and in fact its leader Schlick had been murdered in the street in 1936 by a former student, who had persecuted him for years threatening to kill him [19]. The culprit was apprehended, giving himself up voluntarily, and sentenced. Yet there was not much sympathy expressed for Schlick, he had it coming to him, after all what could you expect from a philosophy of such tenor, it acted like a poison to the minds of the young and unformed. Nöbelick, the doctor of philosophy, was released within two years in connection with der Anschluß. But by the time everybody at the core of the circle had safely emigrated.

Karl Popper is seen, at least by himself, as the nemesis of the Vienna Circle, although to many people he was associated to the movement, something he deeply resented. True, although he was never invited to meetings, he was considered to be its loyal opposition, and Carnap complained that although the distance between him and Popper was small, the distance between Popper and him apparently was enormous. And in fact, both did keep up friendly relations with each other[20], and Carnap saw to it that Popper could publish his 'Logik der Forschung' in their series. The main criticism of Popper against the Vienna Circle seems to be their uncritical rationalism, in particular their rejection of metaphysics. In the words of the British historian and philosopher R.G.Collingwood, whoever rejects metaphysics takes a metaphysical stand. And in the same spirit Popper pointed out that their entire project, to put philosophy on a rational basis, was meta-physical. As noted already once you formalize something, in order to subject it to a systematic scrutiny, you automatically go beyond it. In particular you cannot formalize and include everything in a system amenable to rational inquiry. The Old Jews understood that when they refused to give God a name. To name is to enable something to be talked about, and once God can be talked about like any other topic, it is not God anymore. One should be wary of exploiting Gödel's theorem beyond the assumptions on which it is based, yet it has a seductive appeal to be used as a metaphor. Metaphors should never be taken literally, then they become just silly, but as metaphors they can hint at what cannot be stated explicitly. It is not true that that on which you cannot speak clearly, you need to keep silent.

July 28, 2017 Ulf Persson: *Prof.em, Chalmers U.of Tech., Göteborg Sweden* ulfp@chalmers.se

---

[19] Schlick did enjoy police protection already 1934, but as nothing happened, it became more lax, and Schlick became concerned that he was viewed as the crazy one, not the persecutor.

[20] Martin Gardner, who had been an assistant to Carnap at Chicago, did not consider Popper a nice man he once wrote me, and made little of him. So some animosity between the two must have been present inducing people to take sides