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THE TREE OF KNOWLEDGE AND OTHER ESSAYS

BY

GEORG HENRIK VON WRIGHT

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INTRODUCTION

My intellectual life has developed in two separate groves. They stem ultimately from my own inclinations and temperament. But their course has also been influenced by two powerful personalities who had a major share in the formation of my character. They were Eino Kaila and Ludwig Wittgenstein. Of them too a similar dualism may be said to have been characteristic. The present collection of essays is meant to illustrate it. This makes the collection also a sort of Intellectual Autobiography.

I began my academic studies in Helsingfors (Helsinki) in the mid-1930's. This was the heyday of logical positivism. In Kaila I had a brilliant and charismatic teacher. He had been an associate member of the Vienna Circle and brought to Finland the circle's new philosophy, including the new logic. The atmosphere which I imbued during my first years as a student soon lost its exciting novelty. But it had grounded in me a lasting deep respect for the type of rational thought which had found its fullest expression in the mathematics and physics of the centuries from Descartes to Einstein. The revived study of logic, above all, promised to infuse philosophy too with the same spirit of exact rationality and thereby opened up new vistas for the development of my chosen subject. The Russell of *Principia Mathematica* and the Wittgenstein of the *Tractatus* were the two heroes in philosophy whom I learnt to worship in my youth.

These early experiences set the tune for my later professional work as a philosopher. In the course of time my views have broadened and often changed, but their development never took the form of a drastic break with my own past. The labels 'philosophical logic' and 'analytical philosophy' seem to me to fit my contributions to the subject well—in spite of the critical stand which I, with age, have come to take on many things which habitually fall under them.

The essays in the first part of the book relate to this grove in my intellectual development. In two of the papers I take a synoptic view of the areas in the thought of the century, viz. logic and analytic philosophy, where I have been working myself—and in two others I give a more personal account of my itineraries through

those landscapes. There are also essays on some aspects of the thought of Kaila and Wittgenstein.

Kaila expressly refused the label 'analytic' for his work in philosophy. To label Wittgenstein an 'analytic philosopher' not to say a 'logical positivist' would be widely off the mark. But it would also be quite wrong to think that Wittgenstein's influence on logical positivism and analytic philosophy had been due simply to a misunderstanding. The two trends mentioned in philosophy have something *essential* in common with his thinking, both in its early and in its later phase.

But Kaila as well as Wittgenstein also stood for something different. This might be described as a 'visionary' rationality, expressive of a yearning for what in German is called a *Weltanschauung* and for understanding 'the meaning of life'. This form of spirituality has found its perhaps highest manifestations in art and religion. But one of its traditional outlets has surely been in philosophy—from the pre-Socratics to Nietzsche and beyond.

From puberty on I had been strongly fascinated by this other type of philosophy too. My interest was nourished, not only by acquaintance with the great classics of the subject, but perhaps to an even greater extent by my reading of fiction and poetry and of history which had been the second main subject of my university studies. To begin with, these interests of mine had a predominantly aesthetic and individualistic flavour. Political and social issues did not much engage me as a young man—although I could enjoy as a spectator the panorama which reading about them in books of history presented. Concerns for 'the state of the world' did not weigh heavily on me in my early years.

These interests of mine were difficult to cultivate in the climate of the new 'exactitude' demanded of philosophy by logic and the advanced scientific thinking of the century. They found, in my case, an outlet in writing of an essayistic nature without either scholarly of otherwise academic pretensions. Its aim was to clarify my thoughts on subjects which I felt were important for me as a human being rather than a professional academic. My prospective readers I liked to think of as a circle of educated laymen and intellectuals of a similar bent of mind and cultural background to my own. So it has remained to the present day.

Fruits of my early occupations with the *Weltanschauung* aspects of philosophy were in the first place four longish studies, consisting of 6–8 essays each. Their subject matters were: Werner Jaeger's *Paideia* which had in German the subtitle 'Die Formung des griechischen Menschen'; the philosophies of history of Spengler

and Toynbee; Dostoyevsky's novels; and Tolstoy's frustrated efforts to find his way to religion. The only one of these studies which may have some value beyond the pleasure which pastime reading affords, is the one on Tolstoy. It is also the most personal of the four. The two great Russians have ever since continued to nourish my thought.

The four studies were eventually collected in a book (in Swedish). This was in the mid-1950's. Its publication can be said to mark the end of a period in my development. Soon after, a shift in my interests took place. The form of rational thought which I used to regard as the highest in our culture was becoming increasingly problematic because of the repercussions it had on life as a whole. Scientific technology had, since the time of the first 'industrial revolution', brought about great changes in the living conditions of Western man. This process was gradually leading to an integration of the entire globe in a network of economic and political relationships. It also had a uniforming effect on the expectations and ideals which men entertain about what constitutes 'a good life'. The ideals of progress through modernization had their sources in the secularization of thought ultimately brought about by scientific rationality. But were the effected changes in life-style, in the longer run, more for the good than for the bad of man? In combination with an explosive increase in world population they threatened to impose a load on nature, i.e. the material basis of life, which nature may not be able to sustain.

Doubts thus began to arise in me about those cultural values which I had cherished since my youth. My first attempt to articulate the doubts was the essay 'The Tree of Knowledge' which opens the second part of this volume. In another paper from about the same time, I gave them an ecological or environmentalist dimension related to a contrast between two attitudes to nature, viz. that nature should be 'followed' and that it had to be 'conquered' or 'subdued'. I associated the first with our Greek, the second with our Judeo-Christian cultural legacy. The paper would have been called in English 'Nature, Man, and the Scientific-Technological Revolution'. It is not republished here. But its theme is echoed, a quarter of a century later, in the two papers of this collection, 'Images of Science' and 'Science, Reason, and Value'.

My critical attitude to scientific rationality and its repercussions on life reflected, particularly in its beginnings, not so much concern about the future as curiosity about humanity's present station. I know no better name for the intellectual efforts which this attitude nourished than attempts at a *diagnosis of our times*. Similar 'diagnostic'

activities are known from many quarters in contemporary philosophy, for example Hegelian-Marxist dialectics, the partly Marxist inspired Critical Theory of the Frankfurt School, and French structuralism and post-structuralism. In the orbit of Anglo-American cultural influence this type of thought has been much less prominent,—and it seems intrinsically uncongenial to typically analytic philosophy. My own position is certainly not tied to any of the currents mentioned in what is sometimes misleading called 'Continental philosophy'. It would be an understatement to say that I am not acquainted with them, but an overstatement to call me much influenced by any of them. As was also earlier the case, the inspiration for my thinking has mainly come from literature and history, and from accumulated experience and impressions of 'the world around me'. This self-characterization partly accounts for the fact that I have never tried to offer a *theory* about how the phenomena which were the objects of my thinking should be explained or interpreted. But perhaps one could speak of a *method* which I have been using. It might be sketchily described as follows:

I focus on certain traits and trends which seem to me prominent and peculiar to our time. Then I submit for consideration how these traits have developed through history and which are the forces under whose impact the trends have acquired their present strength. (It is here that science-based technology in combination with a certain view of the man-nature relationship enter the picture.) And, finally, I try to project the trends on to what I have sometimes called 'the screen of the future' *on the assumption that they continue unbroken.* From a study of the picture which appears on the screen one may draw various evaluative conclusions and contemplate alternative futuristic scenarios consequent upon changes in the present trends. But my faith is not strong in the possibilities of changing the trends relying on the 'managerial rationality' which was largely responsible for their coming into existence. For this, forces are needed which I cannot fathom with my intellect.

In a sense, therefore, exploring the second grove in my intellectual life has made me a critic of the form of rationality which has been my moving force in the first grove. This has established a relationship between the two groves which was initially missing. It cannot, however, be said to have fused them into a uniform way of doing philosophy. But perhaps my critique of the times has also taught me a lesson of wholesome self-criticism.

August 1992 Georg Henrik von Wright

PART ONE

LOGIC AND PHILOSOPHY IN THE TWENTIETH CENTURY

I

LOGIC AND PHILOSOPHY IN THE TWENTIETH CENTURY

1

In what follows I try to evaluate the place of logic in the philosophy of our century. The attempt is necessarily subjective. Its outcome may be different depending upon whether the evaluator is primarily a logician or primarily a philosopher. I think of myself as a philosopher who, over a period of almost sixty years, has at close quarters been watching and also, to some extent, participating in the development of logic.

As I see things, the most distinctive feature of 20th century philosophy has been the revival of logic and the fermenting rôle which this has played in the overall development of the subject. The revival dates from the turn of the century. Its entrance on the philosophical stage was heralded by movements which had their original centres at Cambridge and in Vienna, and which later fused and broadened to the multibranched current of thought known as analytical philosophy. As the century is approaching its end we can notice, I think, signs of decline in the influence of logic on developments in philosophy.

Our era was not the first in history which saw logic rise to prominence in philosophy. In the orbit of Western civilization this has happened at least twice before. First it happened in Ancient Greece, in the 4th and 3rd centuries B.C. The second great epoch of logical culture was in the Christian Middle Ages. This was connected with the rediscovery of Aristotle mediated by the Arabs, and it lasted, roughly, from the middle of the 12th to the middle of the 14th century.

In between the peaks logic 'hibernated'. Its latest winter sleep lasted nearly half a millennium—from the mid-fourteenth to the mid-nineteenth century. In this period, there were also logicians of great ability and power. The greatest of them was Leibniz. But his influence *as a logician* on the philosophic climate of the time was small. It was not until the beginning of our century, when Louis

Couturat published his *La logique de Leibniz* and a number of unedited fragments that Leibniz the logician was discovered.

Logic in the state of hibernation was respected for its past achievements, but not thought capable of significant further development. This attitude is epitomized in Kant's well known *dictum* that logic after Aristotle 'keinen Schritt vorwärts hat tun können, und also allem Ansehen nach geschlossen und vollendet zu sein scheint'.[1]

2

What we nowadays commonly understand by 'logic' was not always referred to with that name.

Although the word derives from a Greek root, Aristotle did not use it for what we think of as his works in logic. Initially, they had no common label at all. The name for them, *Organon* ('instrument') dates from the first century B.C.. The Stoics used, with some consistency, the term *dialectics* for what we would call logical study. This term was transmitted to the Middle Ages through the Latin tradition of late Antiquity. One of the earliest works which signalizes the revival of logic is Abelard's *Dialectica*. The same author, however, also used the name 'logica' which then became current during the Golden Age of Scholasticism—only to yield ground once more to the rival 'dialectica' in the period of the Renaissance. Later, also the name 'Organon' was revived.[2] In German writings of the 18th and 19th centuries the terms 'Vernunfts-' and 'Wissenschaftslehre' were largely used.[3]

For the rehabilitation of the name 'logic' the once influential *Logique ou l'art de penser* (1662), also known as the Logic of Port Royal, appears to have been of decisive importance. This revival, however, was concurrent with a deprecation of the medieval tradition and with efforts to create something more in tune with the emerging new science of nature. The logic of Port Royal is not 'logic' in our sense. It is more like what we would call 'methodology', an 'aid to thinking' as the title says.

Kant, who thought Aristotelian logic incapable of development,

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[1] Kant, *Kritik der reinen Vernunft*, p. 7. (Pagination of the second edition, 1787.)

[2] Most notably with Francis Bacon's *Novum Organum* (1620); later also with Lambert's *Neues Organon* (1764); and once again with William Whewell's *Novum Organon Renovatum* (1858).

[3] Thus, for example, by Bolzano whose *Wissenschaftslehre* (1837) is one of the early precursors of logic in its modern form.

wanted to renew the subject by creating what he called a *transcendental* logic. This was to deal with 'the origin, scope, and objective validity' of *a priori* or 'purely rational' knowledge.[4] And Hegel who, it is said,[5] more than anybody else is responsible for the final establishment of the term 'logic', says in so many words that the time has come when the conceptions previously associated with the subject 'should completely vanish and the position of this science (sc. logic) be utterly changed'.[6]

Hegel was not entirely unsuccessful in his reformist zeal. What has since been known as Hegelian or dialectical logic has had a foothold in philosophy up to the present day. But it is not *this* which I had in mind when extolling the rôle of logic in contemporary philosophic culture. Far from it!

It is characteristic of the terminological vacillations that when the true *logica rediviva* entered the philosophic stage in the early decades of our century, it too wanted to appear under a name of its own. Couturat proposed for it the neologism *logistique*;[7] in German it became *Logistik*. The idea was to emphasize, not only its novelty, but also its difference both from the corrupted logic of the immediately preceding centuries and from the Aristotelian and the Scholastic traditions thought obsolete.[8] It was in this 'spirit of modernity' that I, for example, was trained in logic as a young student. That the term 'logistic' never acquired wide currency in English is probably due to the fact that the plural form of the word already had an established use with a different connotation in this language.[9] Instead, the attributes 'mathematical' and 'symbolic' were long used to distinguish the new logic from its ancestral forms.

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[4] Kant, op. cit., p. 78.

[5] Heinrich Scholz, *Geschichte der Logik*, p. 12. Junker und Dünnhaupt, Berlin 1931.

[6] Hegel, *Wissenschaft der Logik*, Teil I, p. 36: 'Allein—sind überhaupt die Vorstellungen auf denen der Begriff der Logik bisher beruhte, teils bereits untergegangen, teils ist es Zeit, dass sie vollends verschwinden, dass der Standpunkt dieser Wissenschaft höher gefasst werde und dass sie eine völlig veränderte Gestalt gewinne.' (Quoted from *Werkausgabe*, Suhrkamp Verlag, Frankfurt am Main 1969.)

[7] See the article 'Logistique' in Lalande's *Vocabulaire technique et critique de la philosophie*.

[8] Whitehead, in his Foreword to Quine's early work *A System of Logistic* (1934), wrote: 'In the modern development of Logic, the traditional Aristotelian Logic takes its place as a simplification of the problem presented by the subject. In this there is an analogy to arithmetic of primitive tribes compared to modern mathematics.'

[9] Cf. comments on the term 'logistic' in C.I. Lewis, *A Survey of Symbolic Logic* (1918), p. 3ff. Dover Publications, New York 1960.

3

In view of the confusion in terminology and multiplicity of traditions, it is necessary to say a few words about what I—and I believe most of us moderns—understand by logic.

Kant appears to have been the first to use the term 'formal' for logic in the tradition of Aristotle and the School.[10] Logic studies the *structural* aspects of the ratiocinative processes we call argument, inference, or proof. It lays down rules for judging the correctness of the transition from premisses to conclusions—not rules for judging the truth of the premisses and conclusions themselves. This gives to logic its *formal* character—and it was with a view to it that both Kant and Hegel complained of the subject's 'barrenness' and lack of *content*.

The 'content' of formal logical study are *concepts*, one could say. Logic studies them, not in their external relation to the world, but in their internal relationships of coherence or its opposite. This is what we call 'conceptual analysis'. In the simplest cases it takes the form of Aristotelian definitions through specific differences within proximate genera. In more complex and interesting cases it consists of the construction of conceptual networks or 'fields', the structural properties of which give meaning to the entities involved. Formalized axiomatic systems are examples of such constructs. Hilbert aptly called them 'implicit definitions'.

The study of inference and of meaning relations between concepts are the two main pursuits of the discipline of logic. Some would perhaps wish to separate the two aspects more sharply from one another and distinguish them as 'formal logic' and 'conceptual analysis' respectively. Both attitudes can be justified. The fact remains that it is the close alliance of the two aspects which has given to philosophy in our century its strong 'logical colouring'.

4

When one of the many subdivisions of philosophy—be it metaphysics or ethics or logic—assumes distinctive prominence, this is usually connected with some *other* characteristic features of the cultural physiognomy of the time. This holds also for the three epochs in Western culture when the study of logic excelled.

In the history of philosophy, the 4th and 3rd centuries B.C.

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[10] Scholz, op. cit., p. 14. Kant, op. cit., p. 76ff.

succeeded the period usually named after the Sophists. This had been an era of childish delight in the newly discovered power of *words* (the λόγοι) in the uses and misuses of *arguments* for settling disputes in courts or in the market. The challenge to reflect critically on these early eruptions of untamed rationality gave rise to the tradition in philosophy known as Socratic and, within it, to the more specialized study of the forms of thought we call logic. This was also the time of the first attempts to systematize knowledge of mathematics—as witness Eudoxos' doctrine of proportions and the pre-Euclidean efforts to axiomatize the elements of geometry.

The cultural setting in which medieval Scholasticism flourished was very different. Mathematics and the study of nature were in low waters. The rational efforts of the time were turned toward elucidating and interpreting the *logos* of the Christian scriptures. In its deteriorated forms this activity acquired a reputation for hair-splitting. But it should be remembered that the 'hairs' split were *concepts* and that their 'splitting', when skilfully done, was conceptual analysis of an acuteness which rivals the best achievements of our century.

With the calamities which befell Europe in the 14th century, the intellectual culture of the Christian Middle Ages also declined. Gradually, a new picture of the world and of man's place in it took shape. It was based on the study of natural phenomena and the use of mathematical tools for theorizing about them. Scholasticism fell in disrepute, and on logic dawned the half-millennial slumber to which we have already alluded.

What was the cause for the revival of logic in the late 19th century? One might see it in the fact that Western science had by then reached a maturity which made it ripe to reflect critically on its own rational foundations. The organ of the new scientific world-picture being mathematics, it was but natural that the reflexion should start with people who were themselves primarily mathematicians like the two founding fathers of modern logic: Boole and Frege.

Their respective approaches to the subject, however, were rather different.[11] Boole, like his contemporary Augustus de Morgan, was concerned with the application of mathematical tools to traditional logic. Their trend was continued, among others, by Peirce and

[11] The difference is interestingly reflected in the titles of the works with which they embarked on their respective tasks. Boole's was called *The Mathematical Analysis of Logic, Being an Essay towards a Calculus of Deductive Reasoning*. Frege's pioneering work had the title *Begriffsschrift, eine der arithmetischen nachgebildete Formelsprache des reinen Denkens*.

Schröder. Frege's objective was different. He wanted to secure for mathematics a foundation in pure logic. To this end he had not only to revive but also to reshape it.

5

The revitalization of logic thus took its origin from foundation research in mathematics.

The line first taken by Frege and then continued by Russell was, however, but one of a number. In the light of later developments, Frege's and Russell's approach is perhaps better characterized as an attempt to give to mathematics a set-theoretic foundation rather than to derive mathematics from a basis in pure logic. Cantor's figure looms heavily in the background of the logicists' efforts.

Another approach to the foundation problems was Hilbert's conception of mathematics as a family of axiomatized formal calculi to be investigated for consistency, completeness, independence, and other 'perfection properties' in a *meta-mathematics*. Hilbert's program is in certain ways a revival of Leibniz's conception of a *calculus ratiocinator*, operating within a *characteristica universalis*.

A third venture into the foundations of mathematics, finally, was Brouwer's intuitionism. It had forerunners in Kronecker's constructivism and the 'semi-intuitionism' of Borel and Poincaré. Brouwer's view of the rôle of logic was very different both from that of Frege and Russell and from that of Hilbert.[12] The bitter polemics between 'intuitionists' and 'formalists' bear witness to this. By raising doubts about one of the cornerstones of traditional logic, viz. the Law of Excluded Third (or Middle), Brouwer and his followers were also pioneers of what is nowadays known as Deviant or Non-Standard or Non-Classical Logic(s).

Logicism, formalism, and intuitionism were the three main schools which, rivals among themselves, dominated the stage during what I propose to call 'the heroic age' in the reborn study of logic. It lasted about half a century, from Frege's *Begriffsschrift* (1879) and *Grundlagen der Arithmetik* (1884) to the appearance of the first volume of Hilbert's and Bernay's monumental *Grundlagen der Mathematik* in 1934. As one who was brought up in the aftermath of this era, I cannot but look back on it with a certain amount of nostalgia. It came to an end in a dramatic climax. I shall shortly

[12] A contemporary account of the state of foundation research in mathematics, still very worth reading is A. Heyting's *Mathematische Grundlagenforschung, Intuitionismus, Beweistheorie*, Julius Springer, Berlin 1934.

return to this. But first, we must take a look at the more immediate repercussions on philosophy which the new logic had had.

6

In earlier days it used to be said that logic studies 'the laws of thought'. This had been the title of Boole's *magnum opus*. But it was also said that logic was not concerned with (the laws of) psychological thought processes. So what aspect of thought did logic study then? One could answer: *the articulation of thought in language*. Language is, so to speak, the raw material with which logic works. (The Greek *logos* means, ambiguously, both speech and ratiocination.) A time when logic holds a place in the foreground of philosophy is also one in whose intellectual culture language is bound to be prominent.

This is eminently true of the Golden Age of logic in antiquity. The Sophist movement had been an outburst of exuberant delight in the discovery of language as *logos*, i.e. as an instrument of argument, persuasion, and proof. The disciplines of logic and of grammar were the twin offsprings of this attitude.

The logic of the School, too, has been described as a *Sprachlogik* or logic of language.[13] An excessive interest in the linguistic leg-pulling known as 'sophismata' seems to have been a contributory cause of the disrepute into which Scholasticism fell in its later days.

The 'linguistic turn',[14] which philosophy has taken in our century, has become commonplace. So much so that one may feel tempted to view logic as one offshoot among many of the study of language, other branches being theoretical linguistics, computer science, and the study of artificial intelligence and information processing. But this would be a distortion of the historical perspective. Unlike what was the case with the Ancients, with whom logic grew out of an interest in language, it was the revival of logic which, with us, made language central to philosophy. Here Frege's work became a seminal influence. But it is noteworthy that Frege the philosopher of language was 'discovered' very much later than Frege the philosopher of logic. This renaissance of Frege's influence and of Fregean studies took place only with 'the turn to semantics' in logic in the mid-century.

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[13] The term presumably first used by Martin Grabmann in his renowned work *Geschichte der scholastischen Methode* I–II, Freiburg i B. 1909–1911.

[14] The phrase borrowed from the title of Richard Rorty's book *The Linguistic Turn*, Chicago 1967. Rorty attributes the invention of the phrase to Gustav Bergmann.

Hilbert's concern with the language fragments we call calculi did not much influence developments in the philosophy of language.[15] Nor did Brouwer's work do this directly. But Brouwer's attack on formalism is, interestingly, also a critique of language as an articulation of the intuitions underlying mathematical thinking. With his thoughts on the limits of language as well as with some other ideas of his, Brouwer is a precursor of the philosopher who, more than anybody else, has contributed to making language a major concern of contemporary thinking.

7

Even though Wittgenstein never adhered to the logicist position in the philosophy of mathematics, he stands in the *Tractatus* firmly on the shoulders of Frege and Russell. The place of this book in the picture we are here drawing is peculiar.

It would be quite wrong to think of Wittgenstein's contribution to logic as limited to the discovery of the truth-table method for propositional logic and the conception of logical truths as truth-functional tautologies. (The truth-table idea has a long tradition going back way before Wittgenstein.)

Foremostly, *Tractatus* is an inquiry into the possibility of language. How can signs mean? The answer Wittgenstein gave was his picture theory about the isomorphic reflection of the configurations of things in the world, in the configurations of names (words) in the sentence. The essence of language is the essence of the world—their common logical form. This, however, is veiled by the grammatical surface structure of actual speech. The logical deep structure of language is a postulated ideal which shows itself in meaningful discourse but which, since presupposed, cannot be itself described in language.

If we abstract from the peculiarities, not to say eccentricities, of the picture theory and the mysticism of the saying-showing distinction, the *Tractatus* view of logic reflects what I think are common and deep-rooted conceptions of the nature of logical form, necessity, and truth. Indirect confirmation of this may be seen in the

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[15] I would conjecture, however, that Wittgenstein's notion of 'language game' and his ideas from the early 1930's of language as calculus have a remote source of inspiration in the influence of Hilbertian formalism on the discussions about logic and the philosophy of mathematics among members of the Vienna Circle. Cf. *Ludwig Wittgenstein und der Wiener Kreis. Gespräche, aufgezeichnet von Friedrich Waismann.* Aus dem Nachlass herausgegeben von B.F. McGuinness. In: *Ludwig Wittgenstein, Schriften* 3, Suhrkamp Verlag, Frankfurt am Main 1967.

coolness, and even hostility, with which logicians and mathematicians, until recently, have received the partly devastating criticism to which Wittgenstein later submitted, not only his own earlier views of logic, but foundation research in general.

The 'metaphysics of logic'—as I would like to call it—of the *Tractatus* has survived and, moreover, experienced revivals in more recent times. I am thinking of developments in linguistic theory and in the partly computer-inspired philosophy of mind represented by cognitive science and the study of artificial intelligence.

The 'never-never language'[16] which Wittgenstein had postulated in order to explain how language, as we have it, is possible, has been resurrected in equally speculative ideas about innate grammatical structures or about an ineffable language of thought ('mentalese'), deemed necessary for explaining the child's ability to assimilate with the language community where it belongs. Chomsky's revived *grammaire universelle* or 'Cartesian linguistics' is another 'crystalline structure' of the kind Wittgenstein in the *Tractatus* had postulated for logic.[17]

For these reasons alone, I think that Wittgenstein's criticism has a message worthy of attention also for contemporary philosophy of language and philosophy of mind. The similarity between the *Tractatus* views and these latter day phenomena has not escaped notice.[18] But it has, so far, hardly been deservedly evaluated from a critical point of view.[19] The present situation in cognitive and linguistic research offers interesting parallels to the search for 'foundations' which earlier in the century made logic central to the philosophy of mathematics, and which reached what I would call its self-defeating climax in Wittgenstein's *Tractatus*.

8

'Every philosophical problem', Russell wrote on the eve of the First World War, 'when it is subjected to the necessary analysis and purification, is found either to be not really philosophical at all, or

[16] The phrase was invented by the late Professor Max Black. See his *A Companion to Wittgenstein's Tractatus*, p. 11. Cambridge University Press, Cambridge 1964.

[17] Wittgenstein, *Philosophische Untersuchungen* (1953), § 107: 'Die Kristallenreinheit de Logik hatte sich mir ja nicht *ergeben*, sondern sie war eine *Forderung*.'

[18] See R.M. McDonough, *The Argument of the 'Tractatus'. Its Relevance to Contemporary Theories of Logic, Language, Mind, and Philosophical Truth*. State University of New York Press, Albany, N.Y. 1986. Particularly pp. 172–183.

[19] The best attempt known to me of such critical evaluation is that of Norman Malcolm. See in particular his book *Nothing is Hidden, Wittgenstein's Criticism of His Early Thought*, Basil Blackwell, Oxford 1986.

else to be—logical.'[20] But he also said that the type of philosophy he was advocating and which had 'crept into philosophy through the critical scrutiny of mathematics' had 'not as yet many whole-hearted adherents'.[21] In this respect a great change was brought about in the post-war decades by the movement known as logical positivism, stemming from the activities of the Wiener Kreis and some kindred groups of science-oriented philosophers and philosophy-oriented scientists in Central Europe. One saw a new era dawning in the intellectual history of man when philosophy too, at long last, had attained *den sicheren Gang einer Wissenschaft*.

According to an influential formulation by Carnap, philosophy was to become the logical syntax of the language of science. This was an extreme position and was in origin associated with views, inherited from earlier positivist and sensualist philosophy, of how a logical constitution of reality, a *logischer Aufbau der Welt*, was to be accomplished.

It is nowadays commonplace to declare logical positivism dead and gone. It should be remembered, however, that the movement was conquered and superseded largely thanks to self-criticism generated in its own circle. This combination of self-destruction with self-development is perhaps unique in the history of thought. At least I know no comparable case. As a result, a narrow conception of philosophy as the logic of science gradually gave place to a conception of it as logical analysis of all forms of discourse. For a just assessment of logical positivism, it is necessary to see the movement as the fountain-head which eventually grew into the broad current of analytic philosophy with its multifarious bifurcations. No one would deny that *this* has been a mainstream—I should even say *the* mainstream—of philosophy in our century. It is in these facts about its origins: first with foundation research in mathematics, and then with the extension of the use of logical tools to the conceptual analysis of scientific and, eventually, also everyday language, that I found my claim that logic has been the distinctive hallmark of philosophy in our era.

9

What I called the heroic age in the history of modern logic came to an end in the 1930's. The turn to a new era[22] was marked by two

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[20] Russell, *Our Knowledge of the External World, As a Field for Scientific Method in Philosophy* (1914), p. 42. Quoted from the edition by Allen & Unwin, London, 1949.

[21] Russell, op. cit., p. 14.

[22] On this turn and its repercussions on foundation research in mathematics,

events, themselves of 'heroic' magnitude. The one was Gödel's discovery of the incompleteness properties of formalized calculi; the second Tarski's semantic theory of truth. There is, moreover, an intrinsic connection between the two achievements.[23]

Gödel's incompleteness theorem had serious repercussions on the formalist program of axiomatization, consistency proof, and decidability. It set limits to the idea, ultimately of Leibnizian origin, of the formalization of all ratiocinative thought in syntactic structures and of reasoning as a *jeu de charactères*, a game of signs ignoring their meaning. The related achievement of Tarski meant a transcendence of the syntactic point of view and its supplementation by a semantic one. Therewith it made the relation of language *structure* to language *meaning* amenable to exact treatment. The immensely fertile field of model theory is an outgrowth of this opening up of the semantic dimension of logic. For its further investigation, Tarski's later work was also of decisive, seminal importance. His pioneering rôle is in no way minimized by the fact that, seen in the perspective of history, basic ideas in model theory go back to the earlier work of Skolem and Löwenheim.

Gödel's impact on the formalist program, although devastating for the more ambitious, philosophic aspirations of the Hilbert school, also greatly furthered its less ambitious aims. Proof-theory crystallized in the arithmetization of metamathematics and in the theory of computable and recursive functions.

Something similar happened to the line in logic stemming from Frege and Russell and continued through the 1930's, most conspicuously in the work of the young Quine. The antinomies turned out to be a more serious stumbling block than it had seemed after the early efforts of Russell's to conquer the difficulties which had threatened to wreck Frege's system. The semantic antinomies, like the Liar, required extensions beyond type-theory which in none of their suggested forms can be said to have gained universal recognition. The sought for basis of mathematics in pure logic gradually took the shape of a foundation in set-theory. Set-theory, being itself a controversial branch of mathematics, gave prominence to another challenge, viz. that of clarifying the axiomatic and conceptual foundations of Cantor's paradise. Even though the difficulties which the logicist approach encountered can be said to have ruined

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see the excellent account by Andrzej Mostowski, *Thirty Years of Foundation Studies, Lectures on the Development of Mathematical Logic and the Study of the Foundations of Mathematics in 1930–1964*. Basil Blackwell, Oxford 1966.

[23] Tarski, *'Der Wahrheitsbegriff in den formalisierten Sprachen', Studia Philosophica I*, 1935. Postscript (Nachwort), p. 404f.

the original aspirations of its initiators, this heir to their program remains, in my opinion, the philosophically most challenging aspect of foundation research in mathematics today. Not surprisingly Gödel, the perhaps most philosophic-minded mathematical logician of the century, devoted his later efforts mainly to work in this area.

The third mainstream in the early foundation research, intuitionism, also changed its course. In 1930 Heyting codified, in a formal system, the logical rules which were thought acceptable from the intuitionist point of view. Thereby he created an instrument which has turned out to be very useful in the mathematical study of proof, and thus for vindicating that part of Hilbert's program which remained unaffected by Gödel's discoveries. In view of the acrimony which once embittered the fight between formalists and intuitionists and not least the relations between the founders of the two schools,[24] their reconciliation in the later developments of proof-theoretic study may even appear a little ironic.

Brouwer himself was of the opinion that no system of formal rules can encompass the entire range of mathematically sound intuitions. He could therefore not attach great importance to Heyting's achievement. Of Gödel's results he is reported to have said that their gist had been obvious to him long before Gödel presented his proofs.[25]

In his rebuttal of the idea that logic could provide a foundation for mathematics, Brouwer can be said to anticipate the attitude of the later Wittgenstein. Wittgenstein also shared the constructivist leanings of the intuitionists and their critical reflection on some basic principles of classical logic.

The change of climate in logic after the 1930's I would describe as a 'disenchantment' (*Entzauberung*) in Max Weber's sense. When the grand dreams and visions of the formalist, intuitionist, and logicist schools had lost their philosophic fascination, what remained and grew out of them was sober, solid science. The discipline which had been the mother of the new logic, viz. mathematics, took back its offspring to its sheltered home.

The homecoming did not fail to raise suspicions among the settled members of the family, however. Early in the century, Poincaré had objected to the *logisticiens*, that they pretended to give

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[24] Cf. Heyting, op. cit., p. 53f. Also D. van Dalen, 'The War of the Frogs and the Mice, or the Crisis of the *Mathematische Annalen*,' *The Mathematical Intelligence 12*, 1990.

[25] Hao Wang, *Reflections on Kurt Gödel*, p. 57 and p. 88. The MIT Press; Cambridge, Mass. 1987.

'wings' (*ailes*) to mathematics but had in fact provided it only with a 'hand-rail' (*lisière*) and, moreover, not a very reliable one.[26] On my first encounter with Tarski a few years after the war, Tarski told me of the difficulties and frustrations he had experienced trying to make mathematical logic respected in the mathematics department at Berkeley. I recall something similar from the mathematical establishment in my own country in the form of complaints that some of the most promising students had left the subject and migrated to philosophy. Now, forty years or more later, this attitude no longer prevails in the mathematical profession, except maybe in corners of the world not yet much touched by modern developments.

10

When viewing the history of modern logic as a process of 'rational disenchantment' in areas of conceptual crisis or confusion, one is entitled to the judgement that the most exciting development in logical theory after the second world war has been the rebirth of modal logic. The study of modal concepts had flourished in the Aristotelian tradition—not only with its founder, but also with its medieval continuation. In the renaissance starting with Boole and Frege, this study, however, long remained neglected. When eventually it was revived in the work of Łukasiewicz and C.I. Lewis, its rebirth was something of a miscarriage. This was so because it took the form of a critique of Russellian logic. Modal logic was thought of as a 'non-classical' alternative or even rival to it.

It was only with the conception of modal logic, not as an alternative to Russell's but rather as a 'superstructure' standing on its basis, that the logical study of modalities got a good start in modern times. This conception did not gain ground until after the second world war, although it had had precursors in the 1930's with Gödel and Feys.

A result of the new start was something that could be called a General Theory of Modality. Instead of 'General Theory' one could also speak of a *family* of related 'logics' of a similar formal structure. These offshoots of an old stem of traditional modal logic have become known as epistemic, doxastic, prohairetic, deontic, and interrogative logic. Historical research has revealed ancestors of many of them either in ancient and medieval logic or with

[26] Poincaré, *Science et Méthode* (1909), p. 193f. The references are to the Edition Flamarion, Paris 1924, Cf. also Russell, op. cit., p. 68.

Leibniz, this prodigious logical genius, whose seeds mainly fell in the barren soil of his own time.

One thing which has made the study of modal concepts controversial is that it problematized one of the basic principles of logic—it too of Leibnizian ancestry—known as the law of intersubstitutivity *salva veritate* of identities. Such substitutivity in sentential contexts is the hallmark of what is known as *extensionality* in logic. A system of logic which disputes or limits the validity of Leibniz's principle is called *intensional*. Modal logic may therefore be regarded as a province within the broader study of *intensional logic*.

Already Frege had drawn attention to limits of extensionality in doxastic and epistemic contexts. Formal operations in intensional contexts, particularly the use in them of quantifiers, have seemed doubtful and unsound to many logicians of a conservative bent of mind. Above all, Quine has been an acute and staunch critic of modal and other forms of intensional logic. But his criticism has also been a challenge and source of inspiration for a younger generation of logicians, partly following in Quine's footsteps, to clear the jungle of modal and intensional concepts and make their study respectable. To this has contributed the invention of the very powerful techniques known as possible worlds semantics. The Leibnizian echo in the name is not mere accident.

With these later developments the study of modal and intensional logic has become progressively less 'philosophical' and technically more refined. Another process of 'disenchantment' is taking place, an initially controversial subject being handed over by philosophically-minded logicians to logically-minded mathematicians.

11

Modal logic, also intensional logic in general, is still in some quarters called 'non-classical'. There is no received view of what should count as 'classical', or not, in logic. As long as modal logic was regarded as an *alternative* to some already canonized structure, the name might have been justified. But modal logic is *not* an 'alternative' to the logic systematized by Frege and Russell—at least not to that part of it which is known as first order logic and which consists of the two layers of the propositional and the predicate calculus.

A way of distinguishing classical from non-classical logic, which cuts deeper both historically and systematically, is the following: Classical logic accepts as unrestrictedly valid the two basic principles, first stated by Aristotle and subsequently known as the Law of

(Excluded) Contradiction and Law of Excluded Middle (or Third). Both are also fundamental in the logic of Frege and Russell. To question the one or the other is tantamount to doubting the division of what is sometimes called *logical space* in two jointly exhaustive and mutually exclusive parts.

Doubts about the exhaustive nature of the partition were already entertained by the founding father of logic himself. (Yet I do not think it right to interpret Aristotle's discussion of the 'Sea-Battle Problem' in the ninth chapter of *Peri Hermeneias* as a denial of the universal validity of the *tertium non datur*.) The same doubts reappeared in the Middle Ages—together with groping attempts to construct a many-valued logic for coping with them. Within modern logic these efforts were renewed by Łukasiewicz. His grand vision of polyvalent logic as a generalization of classical logic did not turn out as fertile as its originator had imagined it to be. The idea of polyvalence has useful technical applications. But the conception of it as a grating of logical space finer than the true-false dichotomy encounters interpretational difficulties. It is therefore doubtful whether many-valued logic should even count as non-classical in the sense which I have in mind here.

A more consequential onslaught on the Law of Excluded Third and some other 'classical' ideas associated with it, such as the Principle of Double Negation, came from Brouwer and the intuitionists. As already noted, formalized intuitionist logic has turned out to be a useful conceptual tool for proof-theoretic study. It provides the logical backbone for a constructivist approach to the notion of existence in mathematics and is also helpful for efforts to clarify the concept of the actual infinite. To count with truth-value 'gaps' has become standard in many fields of formal study where one deals with concepts of restricted definability or of an open texture. The Law of Excluded Middle can hardly any longer be regarded as a controversial topic in the philosophy of logic.

More firm and less assailed, until recently, has been the second pillar of classical logic, the Law of Contradiction, which prohibits truth-value 'overlaps'. Therefore, doubts about it, once they are raised, cut much deeper into the foundations of logic than doubts relating to the *tertium non datur*.

In fact, already Aristotle realized that there might be problems here. First among the moderns to see the possibility of a non-classical opening were Łukasiewicz and the Russian Vasiliev.[27]

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[27] N.A. Vasiliev, *Voobrezaemaja Logika, Izbrannye Trudy*, Ed. by V.A. Smirnov. Nauka, Moscow 1989.

Throughout the history of thought, antinomies have been a headache of philosophers—and since the origin of set-theory also of mathematicians. Antinomies exemplify seemingly impeccable logical inference terminating in conclusions contradicting each other. If this is thought unacceptable, one has to look for some error in the reasoning—and lay down rules for how to avoid the calamity. This was what Russell did with his Type-Theory and Vicious Circle Principle.

Moreover, the appearance of a contradiction in a context of reasoning, such as for example an axiomatic system, seems to have the vitiating consequence of making everything derivable within the system, thus trivializing or, as one also says, 'exploding' it. Hilbert's efforts were partly aimed at proving that sound systems are immune to such disasters. This presupposed that the logic of the meta-proofs has the required immunity. Hilbert saw a warrant of this in what he called the *finite Einstellung* ('finitist stand'), allowing only *finite Schlussweisen*.

Another way of meeting the challenge presented by contradictions is to scrutinize the idea of logical consequence itself. Contradictions may have to be rejected as false, but must they have the catastrophic consequences which 'classical' logic seems to allow by virtue of what is sometimes referred to as Duns Scotus' Law after the *doctor subtilis* of the School? Efforts to modify the classical view of logical consequence or entailment have been the motivating force behind the venture called Relevance Logic. A more recent and more radical step in the same direction is known as Paraconsistent Logic. One of its aims is to show how contradictions can be 'accommodated' within contexts of reasoning without fear of trivialization or collapse.

These non-classical developments in logic, of the past decades, have found an unexpected, but I think not very trustworthy, ally in Dialectical Logic, ultimately of Hegelian inspiration. The best one can hope for is that the treatment of dialectics with the formal tools of paraconsistent and related 'deviant' logics will contribute to a demystification of those features of it which have made it little palatable to rational understanding. A similar service which these new tools may render is that of reducing to its right proportions what Wittgenstein called 'the superstitious dread and veneration by mathematicians in face of contradiction'.[28]

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[28] Wittgenstein, *Remarks on the Foundations of Mathematics*, Third Edition, Basil Blackwell, Oxford 1978, p. 122. In German: 'Die abergläubige Angst und Verehrung der Mathematiker vor dem Widerspruch.'

Just as classical logic, i.e. the logic of Frege and Russell, can be called the sub-structure on which stand the several branches of modal and intensional logic—in a similar way the two main varieties of non-classical logic: the intuitionist-like ones which admit truth-value gaps and the paraconsistent-like ones which admit truth-value overlaps, will serve as sub-structures from which a variety of alternative epistemic, deontic and other logics will grow out and be further cultivated. But these developments are still in early infancy.

12

I have tried to review the development of logic in this century as a gradual progress *from* the philosophic fascination of a foundation crisis in mathematics and the confusions excited by the rediscovery of fields of study long lying fallow *to* increased clarity, exactness, and conceptual sobriety. But logic thus transformed ceases to be philosophy and becomes science. It either melts into one of the old sciences or contributes to the formation of a new one. What happened to logic was that it fused with the multifarious study of mathematics, but also with newcomers on the scientific stage such as computer science and cognitive study, cybernetics and information theory, general linguistics—all being fields with a strong mathematical slant.

Transformations of parts of philosophy into independent branches of scientific study are well known from history. The phenomenon has gained for philosophy the name 'mother of the sciences'. Physics was born of natural philosophy; in some English and Scottish universities it still bears that name. The second half of the 19th century witnessed the birth of psychology and sociology through a transformation of predominantly speculative thinking into experimental and empirical research. In our century something similar happened with logic.[29]

Already in the early days of the developments which we have here been following, Russell wrote: 'Mathematical logic—is not *directly* of philosophical importance except in its beginnings. After the beginnings, it belongs rather to mathematics than to

[29] In a well-known simile, John Langshaw Austin compared this process to philosophy perpetually being 'kicked upstairs'—and he envisaged that his own endeavours would result in the birth of an independent descriptive study of conceptual features of linguistic uses, in a 'linguistic phenomenology'. J.L. Austin, 'Ifs and Cans', *Proceedings of the British Academy*, Vol. XLII, Oxford University Press, Oxford 1956.

philosophy.'[30] And in an unpublished typescript of Wittgenstein's we read: 'Die formale Logik—ein Teil der Mathematik.'[31]

Philosophy, I would say, thrives in the twilight of unclarity, confusion and crisis in fields which in their 'normal' state do not bewilder those who cultivate them or cause excitement in their intellectual surroundings. From time to time, however, philosophic storms will occur even in the seemingly calmest of waters. We can be certain that there will always remain obscure corners in logic too, thus assuring for it a permanent place among the concerns of philosophers. And I can well imagine that individual thinkers will find in logic the raw material for bold metaphysical constructions. As an example might be cited Gödel's conceptual realism with echos of Plato and Leibniz. But it seems to me unlikely that logic will continue to play the prominent rôle in the overall picture of an epoch's philosophy which it has held in the century now approaching its end. This will be so partly because of logic's own success in integrating itself into the neighbouring sciences just mentioned. But it will also be due to the rise on the philosophical horizon of new clouds calling for the philosophers' attention and craving for clarification.

Big shifts in the centre of philosophy signalize changes in the general cultural atmosphere which in their turn reflect changes in political, economic and social conditions. The optimistic mood and belief in progress, fostered by scientific and technological developments, which has been our inheritance from the time of the Enlightenment, is giving way to a sombre mood of self-critical scrutiny of the achievements and foundation of our civilization. No attempt to survey the overall situation in contemporary philosophy can fail to notice this and to ponder over its significance.

I shall not try to predict what will be the leading trends in the philosophy of the first century of the 2000's. But I think they will be markedly different from what they have been in this century, and that logic will *not* be one of them. If I am right, the twentieth century will even clearer than now stand out as another Golden Age of Logic in the history of those protean forms of human spirituality we call Philosophy.

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[30] Russell, op. cit., p. 50.

[31] Wittgenstein, TS 219. Wittgenstein's relegation of formal logic to mathematics is not in conflict with the fact that he calls his own investigations in philosophy 'logical'. The adjective then means roughly the same as *conceptual* or, in Wittgenstein's somewhat excentric terminology, *grammatical*.

II

ANALYTICAL PHILOSOPHY
A HISTORICO-CRITICAL SURVEY

1

Of the main trends in the philosophy of our century the one named 'analytical' is the most typical of the spiritual climate of the time. It is also the current which has spread most widely over the globe. This is due to its alliance with the two forces which more than any other have stamped contemporary civilization: science and technology.

I am aware of an element of subjectivity in my evaluation. It is no doubt tainted both by my experiences and by my personal taste. In what follows I shall try to give it a rational justification. This will be done by means of an examination of the historical origin of the trend and the development of some conflicting tendencies inherent in it from the beginning.

Seen in a longer perspective, analytic philosophy continues the tradition of the European Enlightenment. Not without reason has its perhaps greatest representative, Bertrand Russell, been compared to Voltaire. When it first appeared on the philosophical stage, however, it was in opposition to another current of thought which also stemmed from the Enlightenment. This was the idealist tradition in philosophy. A landmark in the break with the past was G.E. Moore's paper 'The Refutation of Idealism' which appeared in 1903.

When the new philosophy, in the decades between the two World Wars, made its breakthrough on a broad front, it professed to be a great upheaval, a profound revolution in thinking. This time is now long past. In the second half of the century, analytic philosophy has acquired features typical of an established or received tradition of thought. Its characteristic profile has faded; it has become increasingly eclectic. Its identity threatens to go astray.

Simultaneously with this, the climate of opinion has changed. The form of rationality represented by science and technology has become problematic due to its repercussions on society and the living conditions of men. Analytic philosophy, itself an offspring of belief in progress through science, appears inherently incapable of coping with these problems. The task lies rather with other types of philosophy, different from and often critical of the analytic current.

2

In the confusing situation of its identity crisis, it is befitting to subject analytic philosophy to a historico-critical scrutiny. The history of the movement has not yet been written in full. With its increased diversification, it becomes pertinent to try to identify its most essential features and distinguish them from later additions which are alien to its origins.

In the last volume of the pre-war mouthpiece of logical positivism, the periodical *Erkenntnis*, there are two papers which are important for our present undertaking. The first is by Friedrich Waismann and is called 'Was ist logische Analyse?' (What is logical analysis?) The author writes:

'Philosophie und Wissenschaft sind zwei grundverschiedene Typen menschlicher Geisteshaltung.—Der wissenschaftliche Geist sucht nach Erkenntnis, d.h. nach Sätzen, die wahr sind, die mit der Wirklichkeit übereinstimmen. Auf einer höheren Stufe erhebt er sich zur Bildung von Theorien.—Was man durch die Philosophie gewinnen kann, ist ein Zuwachs innerer Klarheit. Das Resultat einer philosophischen Überlegung sind nicht Sätze, sondern das Klarwerden von Sätzen'.[1]

Behind these words lies a view according to which there is a clear and sharp difference between philosophy on the one hand and science on the other. It is a view which Wittgenstein had expressed in the *Tractatus*, and to which he stuck throughout the changes which his philosophy later underwent. This conception has also from the beginning stamped *my* way of thinking about philosophy. The same, however, is by no means the case with all those who call themselves analytic philosophers—whether in the past or at the present time. Among philosophers of this denomination both types of intellectual attitude, as distinguished by Waismann, have been represented—sometimes in open opposition to one another, sometimes in a non-reflective alliance. For this reason, analytic philosophy has, almost from the beginning, been loaded with latent contradictions which in the end had to become manifest, thus destroying the unity of the movement. How this happened, we shall see presently.

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[1] Waismann, p. 265. In English: 'Philosophy and Science are two fundamentally different attitudes of the human mind. — The scientific mind seeks knowledge, i.e. propositions which are true, agree with reality. On a higher level it ascends to the formation of theories. — Through philosophy one can gain increased inner clarity. The result of philosophic reasoning is not propositions, but the clarification of propositions'. (Transl. by GHvW.)

The second of the two papers in the last pre-war volume of *Erkenntnis* is entitled 'Relations between Logical Positivism and the Cambridge School of Analysis'. Its author is Max Black. It is a meritorious first attempt to draw attention to the two-fold roots of the new philosophy and their peculiar characteristics, the root in Vienna and the one in Cambridge. The author is also aware of the contrast between the two attitudes to the nature of philosophy which have prevailed among analytic philosophers.

3

Important currents in the history of thought have often originated from roughly contemporary beginnings in different corners of the learned world. We have already indicated that this holds good of the analytic current in philosophy. For purposes of characterization it is useful, however, to localize the actual birth of the movement to a definite place and time: Cambridge at the turn of the century, and to regard as its founders two men of outstanding stature: Bertrand Russell and George Edward Moore. The two philosophers influenced and inspired each other. It was Moore, younger by one year, who incited Russell to revolt against Kantian and Hegelian idealism and who paved the way to a new platform in philosophy. At the same time, the two were very different. A good deal of the tensions inherent in the movement can be traced to the difference between these two men—including the tension between the two 'grundverschiedene Typen menschlicher Geisteshaltung' distinguished by Waismann.

Russell's search in philosophy, one could say, was for unshakeable knowledge of truth. This holds true both for his early occupations with logic and mathematics *and* for his late efforts to deal with Hume's doubts about induction. In this regard he can aptly be compared to Descartes. Like the French philosopher, Russell first saw the paragon of indubitable knowledge in mathematics. But proof in mathematics proceeded from axioms, and *they* could be doubted. This insight took Russell to logic. As he testifies in one of his several autobiographies, his participation in the international congress of philosophy in Paris in the year 1900 was of decisive importance to his development.[2] There he met Peano and became

[2] Russell 1944, p. 12: 'The most important year in my intellectual life was the year 1900, and the most important event in this year was my visit to the International Congress of Philosophy in Paris.'

acquainted with the Italian school of foundation research in mathematics. As we know, the long term fruits of this meeting were contributions to logic—first in *The Principles of Mathematics* and then, together with Whitehead, in *Principia Mathematica*—which rank with the highest in the history of this discipline.

It is perhaps futile, but at the same time inviting, to speculate whether logic would have come to occupy the central place which it has undoubtedly held in the philosophy of our century, had it not been for Russell's contributions to it and his view of logic as the essence of philosophy.[3] The new logic had been, in the first place, a concern of mathematicians rather than of professional philosophers. Would one, for example, ever had come to realize that one of the greatest philosophers of the 19th century was a professor of mathematics in Jena? Russell generously says[4] that Frege was the first to use the method of logical analysis for dealing with problems of philosophy. In the light of developments which really got under way only in the second half of this century, it would not be inappropriate to see in Frege the actual 'founding father' of analytic philosophy—and to regard Russell as a follower of Frege, rather than Frege as a forerunner of Russell. But it is doubtful whether, without Russell, one would ever have been tempted to accord this position to Frege.

Russell's search for sure knowledge had taken him to logic. As providing a foundation for mathematics, logic was the most unassailable of sciences. And as constituting the core of philosophy, it promised to give to philosophy too, at long last, the certainty and exactitude of a science. In the book of his which perhaps better than any other reflects this attitude, *Our Knowledge of the External World as a Field for Scientific Method in Philosophy*, Russell wrote: 'Philosophy, from the earliest times, has made greater claims, and achieved fewer results than any other branch of learning—I believe that the time has now arrived when this unsatisfactory state of things can be brought to an end.'[5] And in an essay from the 1920's he said that philosophy is 'essentially one with science, differing from the special sciences only by the generality of its problems'.[6] From the standpoint of the distinction made by Waismann, Russell represents the scientific rather than the philosophic attitude of

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[3] Russell 1914, p. 42.
[4] Ibid., p. 7.
[5] Ibid., p. 13.
[6] Russell 1928, p. 71. He continues: 'The new Philosophy conceives that all knowledge is scientific knowledge, to be ascertained and proved by the methods of science.'

mind (*Geisteshaltung*). The same is true—or so I believe—of the great majority of those philosophers who still think of themselves as 'analytic'. Many of them would probably wish to dismiss Waismann's distinction as unduly simplifying or even as altogether misconceived.

4

Russell's quest had been for certainty. Moore thought he already possessed it. In his famous paper 'A Defense of Common Sense' he listed a number of things which he maintained that he knew for sure. For example, that he was a human being, that he had a body, that he had never been on the moon, that the world had existed a long, long time before he was born, etc., etc.

Knowledge of these truths was not the fruit of philosophic reflection, nor of scientific investigation. The truths in question were 'common knowledge'. But they entailed important philosophic consequences. That Moore has a body implies that there are material things. With this Moore thought he could prove the existence of an external world independent of his consciousness. In another famous paper of his, the British Academy lecture of the year 1939, he gave the proof in the form of a pathetic gesture, holding up his two hands and assuring his audience that they exemplified two things belonging to the external world. As Wittgenstein once observed, only a philosopher of Moore's seriousness and intellectual stature could have presented this 'proof' to a learned assembly without thereby making himself ridiculous.

Moore's 'proof' is, of course, no proof. But one could say that it expresses a certain attitude to the problems of philosophy, an attitude with which I sympathize myself and which also, though in a different guise, is known from Wittgenstein's way of thinking. One could try to describe it as follows:

Philosophical views which deny things we all take for granted—also the philosophers when they do not philosophize—must be rejected as absurd or senseless. Examples of such views are that there does not exist an external world independent of our mind, or that everything which exists is material, or that, strictly speaking, one cannot know anything with certainty, or that no man could ever have acted differently from the way he did. These are the theses advocated by the philosophical idealists, materialists, sceptics, and determinists. Since they conflict with things we are sure about in daily life and ordinary discourse, they are preposterous.

As they stand, they have to be rejected, even without argument. That there are material objects, but also things other than material ones, that we 'really know' a good many truths, or that we often, if not always, could have acted differently—all that, and many other things which some philosophers have disputed, must be accepted as fact.

With this, however, philosophizing about such matters has not come to an end. Of that Moore was completely clear. The problem, however, is not with the *truth* of the common sense opinions and statements, but with their *meaning*. What does it mean that there is an external world independent of my consciousness, or that I have a free will? To answer such questions is the task of *analysis*.

It is tempting here to parody one of Moore's examples. Moore said he knew that hens lay eggs.[7] He had not the slightest doubt that this was not so. But what it *means* that hens lay eggs, he had not been able to figure out. A considerable part of Moore's analytical work in philosophy consists in efforts to clarify how things and events in the material (physical) world—such as the laying of eggs by hens—are related to our perceptions of them (the sense data). These aspects of his thinking, however, do not concern us here.

The distinction between questions of truth and questions of meaning is of crucial importance for understanding what is specific not only to Moore's philosophy but to the whole analytic movement. The set task of analysis in philosophy is to clarify the meaning of sentences (statements). However, even though the truth or falsehood of the statements analysed is not at stake for the philosopher, one is entitled to ask whether his analysis of them is correct or not. What decides this? The nature of and criteria for correctness of the results of analysis is itself a philosophic problem. I do not know the solution to it, and I shall not try to penetrate it myself in this paper.[8]

5

Both Russell and Moore were emphatic about the 'analytic' nature of their philosophy.[9] Russell seems to have been the first to speak of

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[7] Moore 1905, pp. 65ff. (Reference to reprint in *Philosophical Studies*, 1922.)

[8] I have made an effort to do so in my 'Intellectual Autobiography' in von Wright 1989, pp. 42–54. But I am little satisfied with my endeavours to reach clarity in the matter.

[9] This is also true of their younger contemporary, Frank Ramsey, as witnessed

logical analysis as a 'method'.[10] In one of his later autobiographies he wrote: 'Ever since I abandoned the philosophy of Kant and Hegel, I have sought solutions to philosophical problems by means of analysis; and I remain firmly persuaded—that only by analyzing is progress possible.'[11] The progress thus attained, he says, is 'the same kind of advance as was introduced into physics by Galileo'.[12]

Russell, however, did not have much to say about the nature and peculiarities of the new method. He did not contribute to its problematization. Moore was more aware of problems here.[13] But what he had to say about them is not very illuminating. His well-known example 'a brother is a male sibling' is a good illustration of analysis, i.e. the splitting up of a concept into components, but completely void of philosophical interest.

In the paper by Waismann, already mentioned, we read: 'Analyse bedeutet Zerlegung, Zergliederung. Logische Analyse scheint also zu bedeuten: Zerlegung eines Gedankens bis in seine letzten logischen Elemente. Und hier schweben uns nun allzu leicht Analogien aus verschiedenen anderen Gebieten vor: Sowie der Physiker das weisse Licht durch ein Prisma zerlegt—wie der Chemiker eine Substanz analysiert—ungefähr so stellt man sich das Geschäft eines Philosophen vor: er soll die Struktur eines Gedankens, seinen logischen Bau bloss legen.'[14]

Russell's celebrated theory of definite descriptions is often cited as a prototype of a philosophically significant analysis.[15] Let us take a look at it here:

According to Russell's theory, as is well-known, the sentence 'Scott is the author of Waverley' means the same as 'There is an x such that x is author of Waverley and, for all y it is true that, if y is author of Waverley, then y is identical with Scott'.

What can we learn from this? First of all, that a sentence of the simple subject-predicate *grammatical* form can have a much more

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by numerous passages in Ramsey 1991.

[10] See Russell 1914, p. 7 and *passim*.

[11] Russell 1959, p. 14.

[12] Russell 1914, p. 14.

[13] See the two papers 'What is Analysis?' and 'The Justification of Analysis' in Moore 1966.

[14] 'Analysis means decomposing, dismembering. 'Logical analysis' thus seems to mean: splitting up a thought into its ultimate logical components. And here we all too easily come to think of analogies from other fields: Just as the physicist decomposes white light through a prism—as the chemist analyses a stuff—roughly like this does one imagine the business of a philosopher: his task is to disclose the structure of a thought, lay bare its logical build.'

[15] Ramsey 1931, p. 263: '—that paradigm of philosophy, Russell's theory of descriptions'.

complex *logical* form. The grammatical build of a sentence does not necessarily reflect its logical structure. And secondly, that logically important concepts may be implicit in a sentence without appearing as words of the sentence. Thus in the sentence 'Scott is the author of Waverley' are concealed the notions of existence ('there is'), of universality ('all'), of conditionality ('if-then'), and also of identity. Analysis makes these latent ingredients manifest.

We are not here interested in the philosophical problems which Russell's theory was designed to solve, nor with the question whether his suggested analysis is correct. There are rival theories about the same topic. Russell's analysis interests us here only as a maximally impressive example of what could be called the *logical grammar* of a given linguistic expression. As such a paradigm it also deeply impressed *the* philosopher, who more than anybody else contributed to making the new way of philosophizing represented by Russell and Moore a world-wide movement.

6

No one could deny that Wittgenstein has been of decisive importance to the development of analytical philosophy, both as author of the *Tractatus* and as author of the *Investigations*. Whether Wittgenstein himself can be rightly called an analytical philosopher is quite another question. Of the *Investigations* one might say that its spirit is alien and even hostile to the typically 'analytic' approach. The *Tractatus*, on the other hand, may in some ways be regarded as a paragon of the analytic trend in philosophy, especially in the form this trend had assumed with Russell and was later carried forward by the members of the Vienna Circle. The later Wittgenstein exhibits some affinities to Moore.

The fundamental problem of Wittgenstein's *Tractatus* is, I would say, the following: How can linguistic signs stand in a meaning-relation to the world? Or shorter: How is language possible? The answer is Wittgenstein's view of language as a picture of reality. What Wittgenstein calls an elementary sentence (*Elementarsatz*) consists of *names* which represent *things* in the world and the mutual relations of which in the sentence picture the mutual relations or configurations of those things in a possible state of affairs. All meaningful sentences other than the elementary ones are so-called truth-functions of elementary sentences.

Things are the substance of the world. The possible relations of things in states of affairs and the corresponding possible relations of

names in meaningful sentences constitute the logical form, the essence, of the world. Thus the essence of language and the essence of the world are one.

Wittgenstein's view presupposes a two-fold analysis of the sentences of a language. First, one must be able to analyze, decompose the elementary sentences into names the concatenation of which in the sentence corresponds to a possible configuration of things in the world. Secondly, one must be able to exhibit all other meaningful sentences in the form of truth-functions of the elementary ones.

In writings immediately before and after the publication of the *Tractatus*, Russell expressed similar views of the logic of language and therewith the world. For his view he coined the telling name *logical atomism*. A logico-atomistic conception has been characteristic of much that goes under the name of analytic philosophy. One might even regard it as belonging *essentially* to this type of thinking. This does not entail acceptance of the picture theory of language. *It* has had relatively little influence on later developments.[16]

It is a peculiarity of Wittgenstein's philosophy of language in the *Tractatus* that one cannot give examples of elementary sentences and of names—and therewith also not of things in the world. This feature is connected with other peculiarities of this deeply 'metaphysical' work. Not only is the logical form often concealed by the grammatical forms of 'language as it is', as illustrated by Russell's theory of definite descriptions. It is also in principle impossible to describe this form in language itself. Wittgenstein's ideal language has therefore aptly been called a 'never-never-language'.[17] The 'crystalline structure' of the logic of language *shows* itself in meaningful speech, but it cannot be *said* to have this or that form.

In the Preface to his book Wittgenstein says that the problems of philosophy rest 'on the misunderstanding of the logic of our language'. When one has a clear grasp of this logic, as it *shows* itself in meaningful use of language, the philosophic problems will disappear. The problems of philosophy are thus pseudoproblems. They cannot be solved—only dissolved. In philosophy one cannot put forward theses for or against which one can argue. For example, that there exists an external world, is not, strictly speaking, a position which one can try to defend with the arguments of realists or to refute with the arguments of idealists.

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[16] An exception is the Finnish philosopher Erik Stenius who with interesting arguments defended a version of the picture theory of language. See Stenius 1960.

[17] Black 1964, p. 11. Black also calls it a *lingua abscondita* (ibid.).

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The author of the *Tractatus* thought that he had disposed with the problems of philosophy once and for all. Having completed his book, he withdrew into intellectual solitude. Philosophically, Cambridge was the place where the book was at home. This situation would probably have lasted for a much longer time, had the book not fallen in the hands of Moritz Schlick and some of his colleagues in Vienna.

Schlick had in 1922 been invited from Kiel to take the Viennese chair once held by Ernst Mach. Round Schlick soon gathered a circle of people. Towards the end of the decade it introduced itself to a broader public with a manifesto under the name 'Der Wiener Kreis der wissenschaftlichen Weltauffassung'. The members of the circle were not 'pure' philosophers, but had all been working also in one or other of the special sciences.[18] Common to them was a scientifically grounded, anti-metaphysical attitude in philosophy. In this they were not unique in Europe. Circles with a similar scientific-philosophic orientation existed in Prague, Lwow (Lemberg), Warsaw and other university towns in Central Europe, including Berlin. There was also lively contact between the circles.

In their fight against idealism, the Cambridge analysts saw themselves as allies of other neo-realist trends in philosophy round the turn of the centuries. The people of the Vienna Circle, on the other hand, viewed themselves as followers and continuators of the positivism of the 19th century particularly in the form it had assumed with Mach, and were thus 'idealistically' rather than 'realistically' tainted. The philosophic position of the circle, particularly in the beginning, could summarily be characterized as a positivism enriched with the instruments created by the new logic. The combination is reflected in the name 'logical positivism' which became the label for the movement, particularly in the English speaking world. The name was not an invention of the circle itself. Its origin seem to be the titles of two books appearing in Scandinavia: *Der logistische Neupositivismus* by Eino Kaila (1930) and *Logistischer Positivismus* by Åke Petzäll (1931).

The Cambridge variety of analytical philosophy had a two-fold root, one with Moore and another one with Russell. One can discern a similar dualism in the movement stemming from Vienna with its two most eminent representatives, Schlick and Carnap. The second is in many ways a follower and continuer of the work of

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[18] *Wissenschaftliche Weltauffassung*, p. 13.

Russell. He must himself have been very well aware of this. Schlick is more akin to Moore. But above all he was under the influence of Wittgenstein. 'The greatest genius of all times in logic' he called him.[19] Of *Tractatus* he said that he was firmly convinced it was by far the most important work in the philosophy of our era. He adds: 'Die Tragweite seiner Gedanken ist in Wahrheit unermässlich; wer sie wirklich verstehend in sich aufnimmt, muss in philosophischer Hinsicht sofort verwandelt sein. Die neuen Einsichten sind für das Schicksal der Philosophie schlechthin entscheidend.'[20]

What Schlick took over from Wittgenstein was, in the first place, the view of philosophy as an activity, the aim of which is to make clear the meaning of sentences. In his famous opening paper in the first issue of *Erkenntnis*, 'Die Wende der Philosophie' (The Turning Point in Philosophy) Schlick wrote: 'Durch die Philosophie werden Sätze geklärt, durch die Wissenschaft verifiziert. Bei dieser handelt es sich um die Wahrheit von Aussagen, bei jener aber darum, was die Aussagen eigentlich *meinen*.'[21] This separation of questions of truth from questions of meaning, which also marks a distinction between science and philosophy, is the same contrast as the one to which Waismann gave expression in his article from the eve of the second Great War when the circle had already ceased to exist and its members been scattered with the winds. The distinctions stem directly from Wittgenstein, but one can also discern in them a distant echo of the voice of Moore.

Philosophic activity attains its end when it makes the problem disappear, vanish. Since philosophy, unlike the sciences, has no specific subject matter of its own, the disappearance of its problems means the disappearance of philosophy itself. Thus the turn (*Wende*) in philosophy, as announced by Schlick in his paper, also signalized the end (*Ende*) of philosophy. This was said in so many words by Schlick himself. The often quoted concluding sentence of his paper runs: 'Dann wird es nicht mehr nötig sein, über "philosophische Fragen" zu sprechen, weil man über alle Fragen philosophisch sprechen wird, das heisst: sinnvoll und klar.'[22]

[19] Oral communication from Eino Kaila to the writer.

[20] In a Preface to the posthumously published Waismann 1976, p. 20f. Also in Schlick 1979, p. 136: 'This book, which in my firm conviction is the most significant philosophical work of our day—The scope of these ideas is in truth immeasurable: anyone who really adopts them with understanding must thereafter be a changed man from the philosophical point of view. The new insights are absolutely crucial to the destiny of philosophy.'

[21] Schlick 1929, p. 8. English in Schlick 1979, p. 157: 'Philosophy elucidates propositions, science verifies them. In the latter we are concerned with the truth of statements, but in the former with what they actually *mean*.'

[22] Schlick 1929, p. 11. English in Schlick 1979, p. 160: 'By then there will be no

Carnap too thought at a time that philosophy in the traditional sense was coming to an end. Its place was to be taken by a 'logic of science' which, he said, was the same as 'the logical syntax of the language of science'.[23] But he had also said, more in line with Schlick and Wittgenstein, that philosophy was not a system or a theory, but a *method*. This method is logical analysis.[24] It yields us sentences which speak about those sentences which are the objects of the analysis. The former belong to the meta-language, the latter to the object-language. The meta-language lays down rules to which sentences of the object-language have to conform in order to make sense. He thereby distanced himself from Wittgenstein's position in the *Tractatus* that one cannot talk meaningfully *about* language. He accepted a position which Russell had already tentatively embraced in his Introduction to Wittgenstein's book, viz. that there is a logical hierarchy of languages. This position is also related to the distinction made by Hilbert between mathematics and meta-mathematics.

The language-metalanguage distinction has played a great rôle in that branch of the analytic movement which might be termed logico-*constructivist* and distinguished from another for which the term logico-*analytic* is more appropriate. The beginnings of logical constructivism (outside logic proper) are found in several of Russell's works, among them *Analysis of Mind* and *Analysis of Matter*. In the former, incidentally, he comes very close to the position of Mach and the logical positivists. An early point of culmination of the constructivist line was Carnap's *Der logische Aufbau der Welt*. It appeared in 1928. It has struck me as strange that this highly meritorious work did not much influence further developments in philosophy.[25]

A 'negative use' of the analytic method, to borrow Carnap's phrase,[26] was for defeating metaphysics and banning it from philosophy. This crusading enterprize was particularly characteristic of the logical positivist phase of the movement and was in the

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further need to talk of 'philosophical problems', since *all* questions will be dealt with philosophically; that is, in a clear and meaningful way.'

[23] Carnap 1934, p. iii–iv: 'Philosophie wird durch Wissenschaftslogik—ersetzt; Wissenschaftslogik ist nichts anderes als logische Syntax der Wissenschaftssprache.'

[24] Carnap 1931, p. 237.

[25] Nearest to a continuation of Carnap's efforts in *Aufbau* comes perhaps Nelson Goodman 1951. Another approach, rather different from Carnap's, to the problems relating to a logical constitution of reality is by Kaila. See the essay 'Eino Kaila's Monism' in the present collection.

[26] Carnap 1931, p. 238.

opinion of its representatives of particular importance and urgency in the then prevailing situation in philosophy.[27] With time the zeal calmed down. Some later developments which can still be called offshoots of analytic philosophy have even come to support positions of a surprisingly speculative and in this sense 'metaphysical' character. I shall later return to this matter.

The activity of the *Wiener Kreis* and related circles of a logico-analytical orientation in Central Europe came to an abrupt and brutal end with the rise of Nazism and the eventual outbreak of the second World War. As campaigning a spirit of 'progressive modernity', this type of philosophy was a chosen target of persecution. Happily, a not insignificant number of its adherents in Austria, Germany, and Poland found refuge in the Anglo-Saxon part of the world. With time they came to play an important part in the philosophical life of their host countries. The return of analytic philosophy to the European continent after the war I find surprisingly slow. In Germany it was championed with great energy by an Austrian, Wolfgang Stegmüller. In his native country the legacy of the Circle seemed for a long time almost extinct.

In the time between its expulsion and its return, the analytic movement itself had undergone great changes.

8

The same year as the Vienna Circle published its manifesto, Wittgenstein returned to Cambridge. Here he developed a 'new philosophy' in the 1930's. I shall not try to describe it. What interests us is its influence on the analytic movement.

The thinking of the later Wittgenstein differs radically from Russell's. Also the personal relations between the two men cooled. Russell of the period after the second World War considered Wittgenstein's development a deterioration and his influence a disaster to philosophy.

The spirit of the *wissenschaftliche Weltauffassung* of the Vienna Circle had always been uncongenial and distasteful to Wittgenstein. But he had also, through his *Tractatus*, greatly fortified this same spirit. At the beginning of his new career as philosopher, too, his thinking was, as far as its thematic is concerned, closely related to what was going on in Vienna.[28] To clarify in detail these relations is an inviting task for the historian of philosophic ideas. Much

[27] Ibid., 'in der vorliegenden historischen Situation nötig und wichtig'.
[28] On this see Wittgenstein 1967.

of Wittgenstein's writings from what has been called his 'middle period' is still awaiting publication.

The disagreement in spirit notwithstanding, there is also a similarity worth noticing in the *ethos* of both the Vienna Circle and the Wittgenstein of the early 1930's. According to an account by Moore, who then attended Wittgenstein's lectures, Wittgenstein was anxious to stress the novelty of his *method*. He said it was going to effect a change in philosophy, comparable to the change brought about in physics by Galileo or to the change in chemistry with the abandonment of pre-scientific alchemy.[29] A similar feeling of having arrived at a turning point in the history of thought was also characteristic of the second upheaval effected by Wittgenstein. It is known as 'the philosophy of ordinary language'. A booklet issued by adherents of this new movement had the title *Revolution in Philosophy*. It can in certain respects be seen as a parallel to the manifesto of the *Wiener Kreis* a quarter of a century earlier.

Although this second revolution had been kindled by sparks from Cambridge, it came to full eruption at Oxford. I have myself strong recollections of this. I had visited Oxford shortly before the war, when the tradition of idealism was still strong there. Alfred Ayer, whom I met for the first time, seemed an unfamiliar local bird. Wittgenstein was next to a mythical figure; Russell and Moore had made but little impact at Oxford. When I returned to the place eight years later, I was confronted with a completely changed situation. Wittgenstein's name was on everybody's lips. Not as author of the *Tractatus*, however, but of the Blue and Brown Books and as an influential teacher whose lectures at Cambridge some privileged people had attended.

The philosopher at Oxford who more than anybody else contributed to this change in the atmosphere was, no doubt, Gilbert Ryle. Ayer's *Language, Truth, and Logic*, perhaps the best semi-popular presentation ever written of the logical positivist and empiricist movement in philosophy, had appeared some years before the war, but its influence in England, as far as I can judge, had not been strong. After the war, Ayer moved to London.

As the name 'ordinary language philosophy' indicates, the new variety of analytic thinking was not much dedicated to logic or to the philosophy of science. In this it was strikingly unlike the type of thought which Russell and the logical positivists had represented. It was more akin to the thinking of the second founding father of

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[29] Moore 1954–55, p. 322. (Ref. to Moore 1959.)

the Cambridge School of Analysis, Moore.[30] Like Moore, the Oxford analysts were interested in clarifying the surface structure of linguistic expressions in common use and not in 'formalizing' with the instruments of logic the deep-structures of mathematical and scientific thinking.

How can such concern with ordinary language be philosophically important or even interesting? Critics of the new movement denied that it could be this and mocked the pretensions of the new trend as leading to a complete trivialization of philosophy. Among them was Russell.

It is in fact not easy to answer the charge of irrelevance. One could perhaps say as follows: In order to be of philosophic interest, concern with ordinary language must aim at solving some difficulty or puzzlement already acknowledged to constitute a *philosophical* problem. This condition is eminently satisfied by Gilbert Ryle's justly celebrated and influential work *The Concept of Mind*. Its topic is, if anything, 'philosophical'. It deals with the nature of the mental and is a critique of what the author calls the Cartesian myth of 'the ghost in the machine'. The new method or way of attacking the problem is described in the Preface to the book, as follows: 'The philosophical arguments which constitute this book are intended not to increase what we know about minds, but to rectify the logical geography of the knowledge we already possess.' Not to discover new truths, but to clarify (old) meanings is the task of philosophy.

The case of the philosopher who will probably stand out for posterity as the most original representative of post-war Oxford Philosophy, John Langshaw Austin, is more complex. He died relatively young in 1960. I would call him the *doctor subtilis* of this new form of scholasticism, thus comparing him *mutatis mutandis* to another Oxford philosopher six and a half centuries earlier. Austin was the unrivalled master in detecting conceptual shades of linguistic usage—superior in this art even to Wittgenstein, I would say.

With Austin, however, it is not always clear whether his conceptual observations on language are also philosophically relevant. Austin himself spoke of his analytic activity as the beginnings of a *linguistic phenomenology*. This is not itself philosophy, but one of philosophy's many off-springs, 'a true and comprehensive science of language'.[31] Its origin is similar to that of many other sciences,

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[30] There are of course also differences. Moore was never influential at Oxford. Perhaps one could say that the influence which he might have had there became eclipsed by the fascination exerted by Wittgenstein on the Oxonian climate of thought.

[31] Austin 1956,p.132.

for example of physics in the 17th or of psychology and sociology in the 19th century. In his paper with the characteristic and witty title, 'Ifs and Cans', Austin wrote: 'Then we shall have rid ourselves of one more part of philosophy (there will still be plenty left) in the only way we can ever get rid of philosophy, by kicking it upstairs.'[32]—One should compare this with the concluding words of Schlick's paper about the turning point in philosophy. (Above p. 35.)

9

Ordinary language philosophy flourished in Oxford from the late 1940's to the early 1960's. The untimely death of Austin certainly contributed to its decline. Of importance was also the ferocious, partly grossly unjust, criticism by Ernest Gellner.[33] But long after this philosophy had lost its greater vigour, Oxford continued to be a Mecca to which philosophers from all over the world made pilgrimage in order to acquaint themselves with the new form of analytic philosophy which ultimately stemmed from the later Wittgenstein.

Independently of Oxford, this philosophy had also begun to invade the United States. Thanks to Max Black and, in particular, Norman Malcolm, Cornell University became a centre of Wittgensteinian philosophy, the influence of which soon extended over the whole continent. Both philosophers had studied at Cambridge before the war. Malcolm has, perhaps better than anybody else, succeeded in fusing influences from Wittgenstein and Moore in an original contribution to philosophy.

In the meantime analytical philosophy also of the logical positivist and empiricist variety had taken root in the USA. A not insignificant share in this process must be attributed to philosophers and logicians from Central Europe who had escaped the physical and spiritual devastation in their home countries. Suffice to mention here only a few of the most prominent names: Rudolf Carnap, Hans Reichenbach, Carl Gustav Hempel, Gustav Bergmann, Herbert Feigl, Kurt Gödel, and Alfred Tarski.

In the United States, however, there already existed an indigenous tradition, akin to the analytical one represented by Russell and the logical empiricists. Its centre was Harvard, and its two leading figures were C.I. Lewis and the 25 years younger Willard

[32] Ibid.
[33] Gellner 1959. The book has an Introduction by Bertrand Russell.

Van Orman Quine. Both were connected to the Harvard tradition of American pragmatism. Of its two classics, William James and Charles Peirce, the second may in fact be counted another founding father of analytic philosophy—alongside Russell and Moore and the figure in their background, Frege. The influence of Peirce is still growing.

When surveying the contemporary state of analytical philosophy, two things are striking.

One is this: Although the movement, having become world-wide, is by no means cultivated only in the English speaking countries, it is yet by and large connected with Anglo-American cultural influence. The movement's first big wave, logical positivism and empiricism, had its original home in Central Europe. It was checked in its development by external forces. As already indicated, it took surprisingly long for it to re-establish itself on the European continent. An explanation for this may be seen in the existence in Germany and also in France of traditions in philosophy which were more fit for survival—such as Hegelianism and phenomenology. Another contributory cause may be the fact that the analytic orientation on the Continent had always been 'peripheral', geographically as well as spiritually. A great part of its original sphere of influence remained, until recently, under the suffocating pressure of marxist-leninist ideology. Now, when this parenthesis has come to a close, it is perhaps reasonable to expect a renaissance of analytic thinking in philosophy in some of the countries which had a share in the movement's early history. This would be in line with their search for 'roots' and for a 'national identity'.

The second thing which strikes one, when reviewing analytic philosophy of today, is a confusing heterogeneity. What is today 'analytic philosophy'? An acute and influential observer, Richard Rorty, writes in his well-known book *Philosophy and the Mirror of Nature*: 'I do not think that there any longer exists anything identifiable as 'analytic philosophy'.'[34] He relates this to the fact that philosophy which calls itself 'analytical' has in many academic surroundings acquired the status of a philosophical establishment.[35] Therewith the movement has lost its former revolutionary

[34] Rorty 1980, p. 172.

[35] Ibid. It has struck me that the *name* 'analytic philosophy', as far as I know, became current relatively late in the history of the movement. It only gradually supplanted the label 'logical positivism' which lingered on long after it had become obsolete. To the change in terminology contributed, I should think, significantly the works of Arthur Pap (1949 and 1955). The early Cambridge analysts and the members of the Vienna Circle insisted on their method being (logical and conceptual) analysis. But they did not use the term 'analytical

ethos. It is no longer a philosophy fighting prejudice and superstition—as logical positivism once saw itself doing. It has, to some extent, itself become an idol, enthroned in self-satisfaction and thus inviting new iconoclasts.

I shall now try to make the rather confusing picture a little more perspicuous.

10

'I hold that logic is what is fundamental to philosophy', Russell wrote in an autobiographical piece from the 1920's.[36] Russell's share in the rebirth and development of logic had been epoch making. Of the members of the Vienna Circle, Carnap contributed greatly to logic—not to speak of Gödel who can be counted as half belonging to the circle.

Is logic a sub-division of analytic philosophy? It would certainly not be right to say so. Should logic any longer be counted as belonging to philosophy at all? This is not an idle question. The new 'exact' logic had one of its main sources in research into the foundations of mathematics and tends now, after some decades of 'philosophical turbulence', to return to its mathematical origins. This can be seen as another example of how a part of philosophy turns into a science—philosophy being kicked another storey upstairs. (Cf. above p. 23.)

Even though logic cannot count as a branch of analytic philosophy, it is right to label the activities of analytical philosophers logical study. By *philosophical logic* I would understand the analysis of concepts which are peculiar to logic proper—such as, for example, consistency and entailment—*and* the application of the formal apparatus of logic for clarifying clusters of concepts generally which attract the attention of philosophers.

In his paper 'Logical Atomism' Russell had said that among the most important tasks of philosophy is the analysis of such concepts as mind, matter, consciousness, knowledge, experience, causality, will, and time.[37] These concepts are not exclusively scientific. They play a rôle also in everyday discourse and thinking. Their clarification does not necessarily call for 'formalization' involving use of symbolic logic. However, formal methods have proved very useful

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philosophy' for their new type of thinking. The (new) name can be said to reflect a beginning syncretism within the movement.

[36] Russell 1924, p. 359.

[37] Ibid., p. 379f.

for the task. The same holds true of the analysis of conceptual structures relating to human action and to norms and valuations. In these uses of philosophical logic I would myself see the core of what still deserves the name of 'analytical philosophy'. It can be said to continue and combine the three traditions of the Cambridge School of Analysis, the Vienna Circle, and the post-war Ordinary Language Philosophy.

In spite of its synthetizing character philosophical logic does not have an exclusive claim to continue the tradition of analytical philosophy. There are also other notable varieties of a movement which has with time assumed a very protean character.

11

A second branch of analytic philosophy, related to and sometimes indistinguishably fused with what I have called philosophical logic, goes under name philosophy of science. Its roots go back to Russell, the logical positivists, and the young Wittgenstein—but also to various older science oriented traditions and trends in philosophy.

The sciences in which the Vienna Circle and related groups in pre-war Central Europe had been chiefly interested were mathematics and physics. In those sciences there had been, round the turn of the century, spectacular progress, but problems had also arisen which puzzled philosophers and scientists alike. To some extent the problems are still there. But in the meantime other sciences have, also thanks to spectacular new developments, come to the foreground of attention and challenged critical reflection. This is true, for example, of the life sciences. Furthermore, new sciences have sprung up and attained prominence. To this group belong computer science, theoretical linguistics, brain research, and cognitive study. Many of them carry a heavy philosophical load because of their relations to logic and the traditional philosophy of mind.

Two features in contemporary philosophy of science should be noted here. The first is the shortcoming of formal logical means for the purposes of clarifying some key ideas common to all the sciences. (This is a reason why I wish to distinguish philosophy of science from philosophical logic.) Examples are the ideas of a law of nature and of scientific explanation. In the early days of analytic philosophy one thought one could 'formalize' the first using the notion of a universal implication and the second using the hypothetico-deductive Covering Law pattern. These simplifying

schematisms have long since turned out insufficient. A faithful account of the logic of actual scientific practice will have to pay attention to various contextual and pragmatic constraints which are inherently incapable of formalization. This holds good also of the criteria of confirmation of scientific hypotheses and of the diachronic phenomena of theory change (in the sense of Kuhn, Sneed, and Stegmüller).

The abandonment of formal methods and the close attention to scientific practice make one wonder to which extent the insights thus attained have philosophical relevance. The answer hinges on a terminological decision. In German the term *Wissenschaftstheorie* has acquired currency. It has a different connotation from *Wissenschaftsphilosophie*. A good deal of that which in English goes under the name Philosophy of Science I incline to regard as belonging to an independent 'science or theory of science' rather than to philosophy—either of the analytic or of some more traditional type.

The second feature of science oriented philosophy which I wish to mention here is quite different from the first. I am thinking of a tendency to look for hidden deep-structures in order to explain or make intelligible manifest surface-structures. This tendency had reached an early climax in Wittgenstein's *Tractatus*. One can see a revival of it in Chomsky's 'cartesian linguistics' which postulates innate syntactic structures for the sake of understanding the child's acquisition of linguistic competence. In later philosophy of language, partly of Chomskyan inspiration, the idea reappears in the form of a postulated inborn universal language of the mind, also called 'mentalese', which one has to presuppose for explaining how man can learn a first natural language.[38] 'In order to learn to speak the child must already have a language' as one could put it pointedly. But this 'primeval' language, like Wittgenstein's ideal language of concatenated names in isomorphic relationship to concatenations of things, is surely a 'never-never-construction', an *a priori* requirement which eludes empirical test.

Similar ideas about other mental functions, for example perception, memory, and thinking, have been current in contemporary philosophy of mind. In view of the devastating criticism to which Wittgenstein subjected his own early efforts to unravel the transcendental presuppositions of language and thought, I find this 'relapse into speculation' surprising, even worrying. One sometimes has the impression that the philosophy which had set itself the task of a 'Überwindung der Metaphysik durch logische Analyse

[38] See Fodor 1975. See also above p. 15.

der Sprache' has become, in some of its late branchings, the perhaps most metaphysically loaded and speculative of all contemporary brands of philosophy worth being taken seriously.

12

Alongside philosophical logic and philosophy or theory of science, mention should also be made of trends in contemporary thought which because of their historical origin, if not for other reasons, can be regarded as variants of analytic philosophy. One sometimes refers to these trends speaking of a 'pragmatic turn' in philosophy. We already noted that pragmatism had been a sort of American parallel to the Cambridge and Vienna schools of analytic philosophy. The contemporary 'pragmatic turn' again might be characterized as a blend of influences from Peirce and the later Wittgenstein. The chief connecting force has been Quine in his later years, after the publication of *Words and Objects* in 1960. The young Quine had been responsible for important contributions both to mathematical and philosophical logic. Of contemporary philosophers he is, in my opinion, the greatest.

In the case of philosophical logic and theory of science one sometimes wonders whether they should still count as philosophy. With the new pragmatic orientation in the philosophy of language and of mind one is less tempted to raise the same question. The pragmatic trend within the analytic movement, if one is allowed that label for a mixed bunch of phenomena, is without doubt philosophy. What can be questioned, however, is whether this philosophy can be correctly characterized as *analytic*.

'Analysis' means division, the splitting up of a totality or whole into mutually separate parts. A view, according to which the characteristics of a whole have to be explained on the basis of features of its parts, is often called *meristic*, from the Greek word μέρος which means part. A view again which explains the features and functions of the parts with reference to the whole is called *holistic*, from the Greek ὅλος. The logical atomism of Russell and the early Wittgenstein is a typically meristic philosophy. The late philosophy of Wittgenstein, as has often been noted, is conspicuously holistic in character. It does not look for a *foundation* of knowledge or thought in conceptual 'atoms' not capable of further analysis, nor for an ultimate *justification* of all true beliefs. The possibility of language need not be *explained*; the facts of linguistic usage and the 'puzzles' arising from it have to be *described* as features of

forms of life characteristic of the 'natural history of man'. Against this changed background of the philosophic enterprise also Wittgenstein's view of philosophy as an activity, and not a doctrine, becomes, to me, more understandable.

The holistic approach to problems of philosophy encourages points of view which in a general sense can be called *relativistic.* Conceptual distinctions which to an older generation of analytic philosophers seemed sharp and univocal, appear blurred or become questionable. A case in point is the analytic-synthetic distinction which Quine problematized in an influential paper a long time ago.[39] Further steps on a road to relativism are Quine's theses on the Indeterminacy of Translation and various views of the contextual dependence of the references of linguistic expressions. This also has consequences for the concept of truth. The correspondence theory which of old had been a dogma of realist philosophers—and in the opinion of many was raised to a new dignity of exactness with Tarski's semantic theory—has begun to lose ground to revived forms of the coherence theory of truth, traditionally associated with idealist philosophy.[40] Russell's and Moore's refutation of idealism, which marked the very beginning of the analytic movement in philosophy, is no longer an accepted article of faith. Thought and the world are not as clearly separable as they seemed in Wittgenstein's *Tractatus*. The pros and cons of idealism are once again in the balance of philosophic debate.

As long as one sticks to the view that there *is* an objective reality, there is hope that differences of opinion will in the end be reconciled through a further approximation to the truth. The case is different if one concedes that opinions may be conceptually *incommensurable.* Then conflicting truth-claims do not necessarily relate to the same reality. This kind of relativity has given rise to lively debate in contemporary cultural anthropology. 'Understanding alien cultures' has become a *philosophical* problem—and with this also the concept of rationality.[41] Behind the new approaches to partly old controversies one can almost always discern the multifarious influences of the later Wittgenstein. But in these regions one is a far cry from anything that could aptly be called 'analytic philosophy'.

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[39] Quine 1953.
[40] See for example Rescher 1973.
[41] See the works *Rationality and Relativism* and *Cultural Relativism and Philosophy* listed among the References.

13

What has been said in the last four sections of this paper was meant to throw light on the 'identity crisis' of the analytic movement. The question of what should today count as analytical philosophy, is not easy to answer. In many cases a *genetic* relationship either to Cambridge or to Vienna is the only criterion to go by.

Since some thirty years there has been a remarkable upsurge in writings by philosophers trained in the analytic tradition on topics in the *history* of philosophy. This trend has, in the first place, concentrated on arguments and thoughts of individual philosophers who can be considered remote ancestors of analytic philosophy such as Aristotle, Descartes, Kant, and the British Empiricists of the 18th century. Hither may also be counted the marked revival among philosophically minded logicians of interest in the medieval scholastic tradition from Anselm to William Occam. The tools developed within the logico-analytic current in philosophy have thus turned out a very powerful instrument for a deepened understanding of the subject's past. At the same time one can in this 'retrospective turn' see a sign of tiredness and slackening of the enthusiasm for the conquest of virgin land which animated the protagonists of what was then 'a new philosophy'. There is no longer a sentiment of bringing the unsatisfactory state of traditional philosophy to an end—as Russell said in 1914. (Above p. 28). One can rather speak of a revived sentiment of veneration for the subject's great past.

The confused and syncretistic picture presented by contemporary global civilization also makes it difficult to distinguish in the present landscape currents of thought which are decidedly *not* 'analytical'. For the sake of marking a contrast, I shall, however, single out two trends in philosophy which seem to me to represent a *spirit* which is characteristically different from or even opposed to what *I* understand by 'analytic philosophy'. The two are mutually related and, moreover, also related to late trends of thought which one usually classifies as 'analytic'.

The first is hermeneutic philosophy. 'Hermeneutics' means interpretation, understanding of meaning. Phenomena which aim at or mean something we call *intentional*. To them belong all artefacts and expressions of human culture—in contrast to things and events in nature which do not, by themselves, mean anything.

The distinction between intentional and not-intentional phenomena answers to a corresponding distinction in the sciences. In German one refers to it with the terms *Geisteswissenschaften* and

Naturwissenschaften. The first is difficult to translate. The terms 'human sciences' and 'humanities' seem too broad. 'Sciences of culture' (*Kulturwissenschaften*) comes closer. Stressing the different nature of the two types of science runs counter to the idea of the *unity of science* which was proclaimed with great emphasis by the logical positivists and is still embraced, it seems, by a majority of science-oriented analytical philosophers. Differences in the views of the sciences reflect in their turn differences in the philosophic orientation generally.

The hermeneutic movement in contemporary philosophy can be seen as a revival of the neo-Kantianism of the Badener School of Rickert and Windelband, but above all of the position held by Dilthey. Hermeneutics was given a new profile by its most eminent modern protagonist, Hans-Georg Gadamer. His influence is noticable also in the Anglo-Saxon and Latin countries. With its diffusion to new surroundings, however, the trend has lost some of its original distinctiveness. Who should be counted as 'analyst' and who as 'hermeneuticist' is not always clear.[42] This applies, for example, to a group of philosophers with whom I feel kinship and who are often labelled 'neo-Wittgensteinians'. Among them should be mentioned Charles Taylor and Peter Winch.

Hermeneutics is a holistic type of philosophy. The holism of hermeneuticists differs, however, from the holism of philosophers of a pragmatist orientation such as Quine or Sellars or Davidson. The philosophy of the former bears a *humanist*, that of the latter a *naturalist* stamp.

Hermeneutic philosophy tries to understand man as a being of culture, a socio-historical creature. It shares this aim with another type of philosophy which is intent on enhancing, through philosophic reflection, the self-awareness of man and therewith also on reviewing critically the societal circumstances under which he lives. The classic example of such a 'praxis-relevant' philosophy is, of

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[42] In von Wright 1971 I proposed a distinction within the hermeneutic current between a hermeneutic dialectical and a hermeneutic analytical branch. Op. cit., p. 182f. 'Perhaps one could, with due caution, distinguish between hermeneutic philosophers of a *dialectic* and those of an *analytic* orientation. The term "hermeneutic philosophy" might then be used as a generic name for both trends. This would serve the purpose of marking a sharper divide than has up to now been thought appropriate between analytic philosophy stemming from the later Wittgenstein and analytic philosophy of the logical positivist or logical empiricist mainstream. With time, such a regrouping will probably do more justice to the morphology of trends in contemporary thought than placing Wittgensteinian philosophy under the heading analytic and regarding continental hermeneutic philosophy as basically a variant of phenomenology.'

course, Marxism. As an off-shoot of its stem one may regard the Critical Theory of the Frankfurt School. Its foremost living representative is Jürgen Habermas. His philosophy is a critique of the civilization characteristic of the industrial societies of the West and its influence on the rest of the world. The ethos of this civilization has been belief in progress through science and technology. Analytic philosophy in its beginnings embraced and strongly affirmed this 'spirit of modernity'. On the whole it has remained faithful to it. Thanks to this it has also been accused—not entirely unjustly—of contributing to the cementation of an established socio-political order. This accusation is not contradicted by the fact that typical representatives of analytic philosophy have been, as individuals, critically engaged in social and political issues of the time. But this engagement of theirs is but loosely connected with their philosophy. I know this self-division from personal experience. Also of Wittgenstein it can be maintained that his severe censure of contemporary Western civilization and doomsday view of the world has little to do with his contributions to philosophy.

14

The picture of analytic philosophy which I have tried to draw becomes increasingly confused and unsurveyable as we move closer to the present moment. In the end it becomes inseparably integrated in the overall picture of contemporary philosophy. Of some of the branches which have grown out of the analytic stem, it holds good that they have attained 'the secure path of science'—but sometimes at the price of losing philosophic relevance. Of some other branches again, no one would question their being 'philosophy', but some might wish to sever them from the analytic tradition altogether in spite of their origins. And among these latter branches there is much heterogeneity.

There are critical observers of the tides of the time who think that the two and a half thousand years history of Western philosophy has come to an even more radical breach with its past than the one proclaimed by representatives of analytic philosophy in the movement's early days. We are, it is said, at the end of a tortuous search for an unshakeable foundation of knowledge and beliefs, for a world-picture which faithfully mirrors 'true reality'. The search has failed in its objective, and the failure leads to a 'decomposition' of the entire past tradition of philosophy. If this is true, analytic philosophy has been one of the contributory factors to it. I am

thinking both of those, who like Russell and the Vienna Circle wanted to make philosophy 'scientific' and of those who in the spirit of Wittgenstein have conceived of philosophy as an activity which aims at making itself superfluous. In both these quarters one has been working to make the turning-point (*Wende*) in philosophy also the terminal point (*Ende*) of the subject—though not exactly in the way envisaged by Schlick who thought that philosophy may no longer be needed because one has become able to speak 'meaningfully and clearly' about all things.

I am myself, presumably, too deeply rooted in the enlightenment tradition of modernity to be able to embrace these 'post-modern' perspectives. But I am also of the opinion that one cannot lightheartedly brush them aside. Because I am convinced of the following:

We live in a time of unprecedented changes in the cultural and social life of man. The turbulence in the spiritual climate makes people feel lost in the world and in desperate need of landmarks for their orientation. Support is offered them from many sources: in the form of spurious claims to 'ancient wisdom' and superstitious teachings of salvation, not infrequently in a treacherous scientistic disguise. Wolfgang Stegmüller, the indefatigable champion of the return of analytic philosophy to Europe after the deluge of irrationality had passed, at least temporarily, speaks in a Preface to his *Hauptströmungen der Gegenwartsphilosophie* of the 'semantic pollution of the spiritual environment of man'. He saw in it a parallel to the destruction and pollution of the physical environment which has become a threat even to the survival of our species.[43] His warning is worth taking seriously. To fight against all forms of the obscuring effects of words on the minds of men is, as I see it, the supreme task of philosophy—not least in the darkness peculiar to our times.

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[43] Stegmüller 1979, Band II, Einleitung zur 5. Auflage, p. xx. 'die semantische Verschmutzung der geistigen Umwelt des Menschen'.

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III

MUSIL AND MACH

1

In 1903 Musil gave up his job as assistant at the Technische Hochschule in Stuttgart, moved to Berlin and began to study philosophy and psychology at the Friedrich Wilhelm University. Five years later he completed his studies and got his doctorate with a published dissertation on the philosophy of science of Ernst Mach.[1]

Musil's main teacher in Berlin was Carl Stumpf, a former pupil of Brentano and Lotze. Stumpf was also a renowned psychologist and author of a two-volume work on the sensation of musical sound, *Tonpsychologie*. Part of Musil's work in Berlin seems to have been done in Stumpf's institute for experimental psychology. His talent as engineer proved itself in the invention and construction of a machine (*Variationskreisel*) for rotating monocoloured discs so as to produce, to the eye, impressions of mixed colours. Musil's appreciation of Stumpf as a teacher is interestingly reflected in an entry in his diary of the mid-1930's when he was living in Vienna. An assistant of Schlick's, he writes,[2] had been talking to him about the then current ideas of 'physicalism' in the Vienna Circle and their application to psychology. To this Musil remarks: 'Wieviel genauer ist es doch in der Stumpfschule zugegangen. Diese nüchterne und wissenschaftliche Atmosphäre war doch ein Verdienst dieses Lehrers'. It is not surprising that the philosophical psychology of the *Wiener Kreis* should have seemed to Musil artificial and barren. A contemporary school in psychology which impressed him more favourably and probably has also left an imprint on his writings as

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[1] *Beitrag zur Beurteilung der Lehren Machs*. Inaugural-Dissertation zur Erlangung der Doktorwürde, genehmigt von der philosophischen Fakultät der Friedrich-Wilhelms-Universität zu Berlin. Berlin-Wilmersdorf: Dissertationsverlag Carl Arnold, 1908. Page references are to this edition.

[2] Robert Musil, *Tagebücher, Aphorismen, Essays und Reden*. Herausgegeben von Adolf Frisé. Hamburg: Rowohlt Verlag, 1955, p. 451f.

an author of fiction was *Gestalt*-psychology, associated chiefly with the names of Wertheimer and Köhler.[3]

Musil, however, did not find work in experimental psychology congenial.[4] The subject matter of his dissertation is pure philosophy. We have no reason to think that the choice of topic was not Musil's own. We know from his diaries that he was already acquainted with and impressed by the work of Mach before he went to Berlin to study philosophy.[5] There was certainly an element of personal concern involved in his choice of a theme. Musil wanted to know whether Mach's claim was correct that the methods and results of exact natural science, when properly interpreted, would give decisive support to the positivistic philosophy which Mach was professing. Musil's answer to the question is No. Mach had not been able to defend his claim consistently. An examination of his arguments revealed inner contradictions.[6] Maybe the answer was a disappointment to Musil—and a contributory cause to his decision to give up continued academic work.

There were external complications too. Stumpf was not too pleased with the work of his student. His own opposition to Mach was deeper and stronger than Musil's. He was hesitant about letting the dissertation pass, and we are told that there were controversies[7] between the two men before Musil eventually, on 14 March 1908, was promoted to the doctorate.

For some years after his promotion, Musil continued to live in Berlin. He was offered a *Dozentur* in philosophy in the university of Graz in Austria, where Meinong was Professor. Musil, however, declined the offer. He moved to Vienna early in 1911 and took up employment in the Library of the *Technische Hochschule*.

After the dissertation, Musil did not publish anything strictly 'philosophical' of his own. There are a few reviews of philosophical and psychological books, and a long—at the same time critical and understanding—essay from the year 1921 on Spengler's *Untergang des Abendlandes*.[8] It is hardly any longer possible to tell in detail

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[3] See *Tagebücher*, on a meeting in Vienna in 1911 with von Hornbostel and Wertheimer, and p. 291 and p. 631f. on Köhler.

[4] *Tagebücher*, p. 445: 'Wenig Freude am psychologischen Experiment'.

[5] Cf. *Tagebücher*, p. 37.

[6] *Dissertation*, p. 78.

[7] Karl Dinklage, 'Musils Herkunft und Lebensgeschichte' in *Robert Musil, Leben, Werk, Wirkung*, herausgegeben von Karl Dinklage, Zürich: Amalthea Verlag, 1960, p. 217. The information is from the psychologist J. von Allesch who knew Musil in Berlin. Details of these 'wissenschaftliche Auseinandersetzungen' are not known.

[8] 'Geist und Erfahrung, Anmerkungen für Leser, welche dem Untergang des Abendlandes entronnen sind', *Der neue Merkur*, March 1921.

to what extent Musil followed the changes in philosophy and psychology[9] in the decades between the two wars. I do not know that he participated in the activities of the *Verein Ernst Mach* or associated much with members of the *Wiener Kreis* when he was living in Vienna in the 1920's and 30's. But he is known to have been a frequent visitor to the house of the mathematician-philosopher Richard von Mises, when he again resided in Berlin in the years before Hitler came to power. Von Mises was a prominent member of the circle of empiricist philosophers in the German capital who closely cooperated with their Viennese colleagues. It can hardly be doubted that Musil was informed about what was going on in these circles. (Cf. above on his reaction to 'physicalism'.)

It would be particularly interesting to know whether Musil had read Wittgenstein and what his reaction was to the author of *Tractatus Logico-Philosophicus*. There seems to me to exist a great kinship between these two most remarkable men. Also, their life-curves show a striking resemblance. What Musil writes about feeling (Gefühl) and related psychological concepts in the unfinished parts of *Der Mann ohne Eigenschaften* is often astonishingly like the 'later' Wittgenstein's writings on these topics. I have seen one brief mention[10] that Musil had taken interest in the changes in Wittgenstein after the *Tractatus*—but I should regard it as practically excluded that he had seen or read any of the dictations or manuscripts by Wittgenstein which were in circulation in the 1930's. (Nor do I know that Wittgenstein had ever read Musil.)

2

The two philosophers who had most strongly impressed Musil were Nietzsche and Mach. If we had to mention a third, it would probably be Ralph Waldo Emerson. Musil's reading of Nietzsche goes back to 1898. His first acquaintance with Mach seems to have been in 1902 when he was living in Brünn in Moravia where a year earlier he had matriculated as engineer from the *Technische Hochschule*.

It would be tempting to see in Mach the source of inspiration for Musil's abortive venture into academic philosophy, and in Nietzsche

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[9] Cf. *Tagebücher*, p. 445: 'Geistiges Miterleben der Wendung in der Psychologie und Philosophie'.

[10] By Ervin P. Hexner in 'Musils Interessenkreis' in *Robert Musil, Leben, Werk, Wirkung*, p. 143. It is not clear from this reference, however, whether Musil's interest concerned the changes in Wittgenstein's style of life or style of thinking.

the philosopher-poet who kindled the spark in Musil the novelist.

This judgement would not be entirely wrong. Certainly the influence of Nietzsche was much longer lasting and can be clearly seen also in the mature writings of Musil. Traces of Musil's reading of Mach may be discernible too—but at least to me they seem accidental and without deeper significance to the content of Musil's later thoughts.

When set in the proper perspective of the time, however, the combination Mach-Nietzsche is more significant than many a modern reader might suspect. The philosophy of Nietzsche can be associated with such attributes as 'subjectivist' and 'voluntarist', that of Mach with 'phenomenalist' and 'positivist'. Both pairs of attributes have an affinity with something which is sometimes also labelled 'idealism'. Mach and Nietzsche were further exponents of a *Zeitgeist* which can be characterized as post-Darwinian 'evolutionism'.

Nietzsche made no systematic effort to develop an epistemology or theory of knowledge. The scattered remarks on epistemological matters which are found in his writings show similarity with the 'phenomenalism' or 'sensualism' of Mach. The parallelism was noted in a work of the time, viz. Hans Kleinpeter's *Phänomenalismus.*[11] Kleinpeter also wrote studies on Mach's philosophy of science.[12] He is, incidentally, one of the very few authors, beside Mach himself, to whom Musil refers in his dissertation.

One sometimes talks of a Hume-Mach tradition in epistemology —represented also by Bertrand Russell in some of his writings, and later by the logical positivists. As far as theory of knowledge is concerned, Nietzsche too belongs in this tradition.

Round the turn of the century philosophy witnessed a reaction against the positivist epistemology in the spirit of Hume and Mach, as well as against various forms of 'idealism'. In the German-speaking world this reaction can be said to stem from the philosophy of psychology professed by Brentano. Meinong in Austria, Husserl and Stumpf in Germany, and the Pole Twardowski were outstanding pupils of this remarkable teacher. In the English-speaking world Moore and the early Russell represented a similar trend. The first part of Husserl's *Logische Untersuchungen* had

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[11] *Der Phänomenalismus, eine naturwissenschaftliche Weltanschauung.* Leipzig: Barth, 1913.

[12] *Die Erkenntnistheorie der Naturforschung der Gegenwart.* Leipzig: Barth, 1905. (Dedicated to Ernst Mach.)

appeared in 1900. Moore's celebrated 'Refutation of Idealism' was published in 1903. In neither is Mach directly a target of attack but the kind of sensualist epistemology which he represents certainly is. A most violent attack on Mach's 'idealism' was Lenin's *Materializm i empiriokritizizm* published the year after Musil's dissertation. In the philosophy of physics Boltzmann, Mach's colleague in Vienna, defended a 'realist' position in conscious opposition to Mach. Of the two great innovators in physics in the early years of the century, Planck followed Boltzmann, whereas the young Einstein was more a follower of Mach.

It is in the setting of these philosophical issues of the time: 'realism' *versus* 'idealism', 'phenomenology' *versus* 'phenomenalism' that one also has to place Musil against Mach. Like Boltzmann and Planck, Musil can be said to defend a realist position in the philosophy of physics. He criticizes, in particular, the 'fictionalist' and 'subjectivist' aspects of Mach's thinking. A crucial issue concerns the status of natural laws and whether there is a *physical* necessity ('in nature') or only a *logical* necessity ('in thought'). Musil argues against Mach in favour of the notion of natural necessity. But, as we shall see, his argument is not convincing and contains an obvious *non sequitur*.

Basic questions in the general theory of knowledge are, on the whole, set aside in the dissertation. There are some very trenchant critical remarks on Mach's phenomenalism and on his efforts to overcome the mind-body dualism. But there is hardly a trace of defence of the act-object analysis of states of consciousness which is so central to Brentano and his pupils or, for that matter, to Moore. This is in line with Musil's aim as set forth in the concluding paragraph of the Introduction to the book. His statement is worth quoting here in full:

> The only aim of the present work is to get as exact a view as possible of the inner consistency of what Mach says. If one wanted to take into account the truth of Mach's results rather than the rigour of the arguments for his views, a much more broadly based work of epistemology would be needed. The present work is intended only as a contribution to such a broader work. It avoids, as far as possible, taking up positions which would require justification by reference to any personal opinions and limits itself to the attempt to demonstrate, by way of immanent critique, that Mach's account contains, besides numerous positive features, so many contradictions or at least obscurities, that it is impossible to accord it any decisive significance.

One gets from these lines the impression that Musil was anxious to stress his unwillingness to commit himself to any *alternative* to

Mach's philosophy. Considering this and also the fact that Musil's 'immanent criticism' of Mach is not always very convincing, one can well understand the reserved attitude of Stumpf to the dissertation. The merits of the work, it seems to me, lie in the concise and lucid presentation rather than in the criticism or attempted refutation of Mach's philosophy of science.

3

After having stated in the Introduction the aim of his investigation and summarized some of the main tenets of Mach's philosophy, Musil proceeds to examine Mach's 'biological' view of science as a process for acquiring and systematizing knowledge. This scrutiny is undertaken in the second chapter of the book. It leads to an important distinction (p. 24) between what Musil calls an 'indifferent' and a 'sceptical' interpretation of Mach's standpoint. On the first interpretation, roughly speaking, Mach's emphasis on economy, idealization, and search for invariance and permanence is only a description of the way science progresses and scientific knowledge accumulates. On the second, Mach's position is also thought to warrant far-reaching epistemological and ontological conclusions of a 'sceptical' nature about the foundation of knowledge and the criteria of truth in science. Under the 'indifference'-interpretation one can, on the whole, agree with the account Mach gives. An important aspect of the *Werdegang* of the exact sciences is thereby described in biological and psychological terms.[13] The 'sceptical' interpretation, however, Musil is inclined to reject: in no case does it follow logically from Mach's 'denkökonomische Betrachtungsweise'.

Mach himself is not very clear about his own pretensions. But that he, by and large, saw his position as a sensualist (phenomenalist, positivist) philosophy of knowledge with the 'sceptical' implications traditionally associated with such a position is all too obvious from many of his utterances. It is of some interest in the context to note Musil's reference to Kleinpeter (p. 26), who not only gave to Mach's view the 'sceptical' interpretation which Musil criticizes but also interpreted Nietzsche in a similar vein (above p. 56).

In the third chapter Musil gives an account of Mach's criticism of the 'mechanistic' world-picture of classical physics and of some

[13] Cf. Husserl's judgement on Mach in *Logische Untersuchungen*, Vol. I, Ch. ix. This comes very near to Musil's opinion. There is no mention of Husserl in the dissertation, however.

of its key concepts—mass, energy, inertia, space, time, movement, temperature, etc. The account given of Mach's 'antimechanism' seems to me extremely good and Musil's own, on the whole positive evaluation of it (p. 36) agrees, I think, fairly well with the present standpoint in the philosophy of science. Of Mach's criticism of the key concepts Musil says, rightly I think, that it perhaps constitutes the most important part of Mach's achievement (p. 40).

The fourth chapter deals with Mach's criticism of causality. The idea that causality is obsolete in science and has to be replaced by the notion of functional dependence or relationship can be said to have been in the air at the time. To English readers it is probably best known from Bertrand Russell's famous paper 'On the Notion of Cause', published in the Proceedings of the Aristotelian Society for 1912–1913. The ideas of Mach and (at that time) also of Russell may be characterized as a consistent development of the criticism of causality by David Hume.

Mach's criticism is trenchant and still today of great interest. Musil concedes that from the point of view of the working scientist Mach's position contains much truth. But from the point of view of the epistemologist it leaves open crucial questions. In what way and in what sense do the functional relationships between the scientist's conceptual idealizations correspond to relationships between 'real' phenomena? In particular: Does Mach's criticism show that the idea of necessary connections in nature must be banished from scientific thinking and regarded as an atavistic remainder from a more primitive stage in man's intellectual history?

The discussion of these questions is pursued in the fifth and concluding chapter of the dissertation. The gist of Musil's argument against Mach seems to be that Mach, by denying the existence of necessary connections in nature, is unable to account for the obvious fact—rightly emphasized by Musil—that 'eine logische Verknüpfung nur dann einen Erkenntnisgrund abgeben kann, wenn sie durch eine sachliche Grundlage gerechtfertigt ist' (p. 57). I do not think that Musil's argument holds water, however. He thinks he can accuse Mach of inconsistency. Mach had agreed that science can be successful in its pursuit of laws only if there exist regularities in nature and that the predictability of phenomena on the basis of laws is proof of the uniformity of the world. Now Musil thought that if it is agreed that the equations or functional relationships which are the laws of nature have to correspond to regularities among the phenomena, then there must exist necessary connections in nature. At first (p. 67) he does not say this expressly. He says that 'solange die Gleichungen tatsächliche gesetzliche Beziehungen

ausdrücken—weisen sie auf reale notwendige Verknüpfungen'. This, presumably, only means that there is an 'Anschein von Notwendigkeit' in nature (p. 67). But later he goes a step further and says (p. 79) that Mach, by postulating lawlike connections between natural phenomena, is thereby also postulating necessary connections in nature. Musil is here identifying 'lawlike connection' with 'necessary connection'.[14] Before he had only said that the first 'hinted at' the second. For the step from this to an identification of the two he produced no argument. Yet the question whether the notion of natural law involves the notion of natural necessitation is the very question at stake in the discussion. Mach denied this involvement. Musil simply assumes it. But thereby he also begs the question—and his conclusion against Mach is a *non sequitur*.

Before his final return to the question of law and necessity, Musil had made a digression (pp. 70–75) into a related, yet clearly distinct topic, viz. Mach's sensualism (phenomenalism) and Theory of Elements. Some of Musil's observations in this context are in my opinion very well taken. Mach thought that the laws of nature ultimately describe relations between constituents of reality which he calls 'Elements'. What these 'Elements' are is, however, not made very clear. As examples, Mach mentions colours, tastes, tones, odours, (sensed) temperatures, etc. He calls them 'sensations'—but he also insists upon their character as a 'neutral stuff' out of which both the mental (psychical) and the material (physical) aspect of reality may be constituted. (The position is also known as 'neutral monism'.)

Musil acutely observes (p. 71) that the 'elements' which are related to each other through the equations of physics are not sensory but conceptual units. Even if the 'raw material' of concept formation has to be given in sensory experience, the concepts themselves cannot be identified with 'bundles of sensations'. This is true of colours and tastes as well as of the more 'abstract', quantified concepts which occur in the functional relationships of natural laws.

Musil's criticism of the sensationalism of Mach stands somewhat apart from the rest of the content of the dissertation. In Mach's philosophy it occupies a central position. A few decades after Musil had criticized it in his dissertation, it experienced a revival, first in Russell's *Analysis of Mind* (1921) and later in the doctrines of some of the logical positivists. Its historical importance notwithstanding one has, however, the impression that it has now receded into

[14] *Dissertation*, p. 79: 'feste, gesetzliche, das sind aber notwendige Beziehungen in der Natur'.

obsolescence. This, however, is not true of Mach's philosophy of science in the more restricted sense, i.e. of what he has to say about the character and status of laws of nature, about the categories of causality and substance, and about the fundamental concepts of mechanics, optics, and the theory of heat. What makes Musil's dissertation interesting to a modern reader is that it concentrates on those aspects of Mach's thoughts which seem most challenging and fresh today and probably will in the long run be regarded as those of most lasting importance. Musil is, I think, far from always successful in his efforts to criticize Mach, but his exposition of Mach's thought is fair and lucid and the dissertation still makes good philosophical reading.

4

Of all the great writers of this century Musil is perhaps the one who is most deeply 'philosophical' in the true sense of this word. But what is fertile and original in his thinking is not found, not even in germ, in his dissertation on Mach. Musil's digression into philosophy after he gave up the career of an engineer for which he had been trained turned out to be a blind alley for his genius. It was on the other road which he entered at about the same time with the publication of *Törless* (1906) and the early plans for what eventually became *Der Mann ohne Eigenschaften* that his creative talent and genius found fulfilment. This is true, also, of the philosopher in him.

IV

EINO KAILA'S MONISM

1

In several works from his later years Kaila describes an episode which he calls his 'philosophic awakening'. As far as I know, the description first occurs in the most personal of Kaila's writings, the book *Tankens oro* (the Swedish title could be rendered in English as 'The Disquietude of Thought') of the year 1944.[1] With some variations it recurs in a paper published nine years later[2] and then, once again, in a posthumously published chapter of his unfinished book with the next to untranslatable Finnish title *Hahmottuva maailma*[3]—*roughly* 'The World as a Structured Whole'. The episode is located to a beautiful summer day when he was sixteen years of age[4] and lay floating in a rowboat on a Finnish lake watching the clouds drifting in the sky.

Then it seemed to him suddenly—these are his words—'that everything which there is is in some very deep sense a unified whole, so to say an 'all-unity', a self-structuring totality'.[5] This self-structuring whole he calls in another of the descriptions, with a reference to Spinoza, *natura naturans*. It exists to the exclusion of everything super-natural from the world.[6] It also entails the rejection of 'all kind of dualism'.[7] There is no unbridgeable gap separating the so-called material from the so-called spiritual, the lifeless from the living, the bodily from the mental.[8] With a note reminiscent of Leibniz he says[9] that the difference between all these contrasts is only one of degree, not one of kind, and that there are

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[1] Kaila 1944(1), p. 104f.
[2] Kaila 1953, p. 261f.
[3] Kaila 1979(1), p. 436ff.
[4] Probably 1907, but might be one year earlier.
[5] Kaila 1953, p. 261.
[6] Kaila 1979(1), p. 436.
[7] Kaila 1953, p. 261.
[8] Ibid.
[9] Ibid.

between them hidden bonds which connect them to inseparable wholes.

The task, Kaila says[10] of 'clarifying, supporting and proving true this monistic or unitarian conception' is the *one* task which has kept him engaged through all the years which passed after his awakening to become a philosopher.

2

Before following Kaila on his lifelong journey to clarify the meaning and nature of his early monistic vision, let us stop for a moment to consider what might have been its roots. It is obvious that a monistic view of the world such as Spinoza's—also with its pantheistic tenor—had a strong resonance in Kaila's personality. This was a rare combination of critical and visionary powers—the ideal intellectual equipment for a philosopher, one might say. But it is also obvious that both early reading and influence of a prevailing 'climate of opinion' contributed to the way in which he was going to make use of his gifts.

The only book which is mentioned in the descriptions of his 'awakening' is Friedrich Paulsen's *Einleitung in die Philosophie*, which was at the time in common use as a university text-book.[11] But he also says that he received his strongest impressions from Spinoza, Leibniz, and Kant.[12] He saw in the joint achievement of these three great thinkers that which in the posthumous fragment already mentioned, he called the 'classical view' of the mind—body problem and which, in substance, he identified with his own. One is struck by the fact that he does not mention Descartes, who gave to the problem its modern form. But by being a dualist Descartes also created the difficulties which his successors through the centuries tried to overcome in what might be called, vaguely, a 'monistic synthesis'.

This view of our 'classic' philosophic inheritance is in tune with the general cultural atmosphere which prevailed, particularly in the arts, in Finland and Scandinavia during the decades round the turn of the century. It is sometimes referred to with the name

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[10] Ibid.

[11] Kaila 1944(1), p. 105. I like to think that this book played a similar role as a guide to philosophy for Kaila as another well-known text of roughly the same time, viz. Wilhelm Jerusalem's *Einleitung in die Philosophie*, played for me. Kaila's very first published philosophic writing was, incidentally, a review of Jerusalem's book in the daily paper *Uusi Suometar* for October 1st, 1910.

[12] Kaila 1979(1), p. 437.

neo-romanticism and contrasted with the preceding period of naturalism which had culminated in the 1880s. In Finland it is also known as the era of national romanticism. It was the time when the 'classics' in Finnish literature, painting, music, and architecture were active. Young Kaila's great artistic sensibilities could not fail to be deeply touched by what was going on; he was also personally associated with the galaxy of artists whose brightest star was Jean Sibelius. No person has made a deeper impact on Kaila than the master of Finnish music.

The *Weltanschauung* which looms in the background of this cultural situation—most strongly reflected in the literature of the time—is a pantheistic feeling of man as a member of a world in which the naturalistic and the spiritual elements are inseparably knit together.[13]

These sentiments are widely reflected also in the philosophical literature of the period. A writer who was much read in Finland was the Danish philosopher Harald Høffding. He defended a neo-spinozist psycho-physical parallel-theory. He certainly had a formative influence on young Kaila's way of thinking. One of Kaila's first published papers was a presentation of Høffding for the Finnish reading public.

Since the late 1880s a lively debate had been going on in the Philosophical Society of Finland between supporters of Cartesian dualism and supporters of the then fashionable parallel- or identity-theory of the mind—body relationship. The chief combatants had been the Society's founder and chairman Thiodolf Rein and our renowned moral philosopher Edvard Westermarck. Both defended in turn the one and then the other position, much to each others' consternation.[14] It is actually in the context of this debate that we see Kaila first enter the philosophic arena. On 4 November 1910 he read in the Society a paper about Hugo Münsterberg's work *Philosophie der Werte*. In the ensuing discussion, according to the minutes, he defended, with a reference to Mach, the empirio-criticist view that the immediate experience does not make a distinction between the physical and the psychical. Rein and Westermarck were both present and seemed to have regarded the views of the young speaker with some scepticism.

Mach was, with Avenarius, the most prominent defender of a monistic philosophy known as empirio-criticism in the early days of

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[13] The peculiar *Zeitgeist* of Finnish neo-romanticism round the turn of the century is perceptively described in Sarajas 1961.

[14] For details see von Wright 1983.

the century. How deep its impact was on Kaila we cannot exactly tell. I have found only a passing, though approving, reference to Avenarius in his writings.[15] Mach, on the other hand, is a writer with whose thoughts Kaila throughout his mature career confronted his own. This confrontation, however, was also polemical. Kaila was always critical of Mach's phenomenalism which in Finland had an eloquent defender in the philosopher Rolf Lagerborg. Particularly in the much later work *Über den physikalischen Realitätsbegriff* which is perhaps the most accomplished of his contributions to the philosophy of the natural sciences Kaila criticizes Mach's positivist and phenomenalist approach to physics as running 'counter to some of the deep tendencies of physical research over the last four centuries'.[16] These tendencies, as Kaila understood them, were decidedly monistic or unitarian—but not necessarily in agreement with the empirio-criticism of Mach. Still, he never concealed and often professed his high admiration for Mach.[17]

Another monistic philosophy of the time which young Kaila emphatically rejected was the one whose chief proponents were Haeckel and Ostwald.[18] It flourished in the form of a movement with a strong—as one would say nowadays—'scientistic' ethos and also with marked anti-clerical and reformist social tendencies. In one of his earlier printed papers,[19] Kaila criticized the 'scientific world-view' of the Haeckel/Ostwald type of monism as being 'philistine and superficial natural science' bordering on vulgar materialism. A few years later he wrote polemically against Lagerborg,[20] who took a not uncritical but still decidedly favourable view of the program of the monistic movement. Kaila expresses astonishment that anyone could take seriously the, as he calls it, 'conceptual chaos' of Haeckel.

3

As we have seen, even before Kaila had tried to articulate clearly his *own* monistic philosophy, he had criticized the monism most *en vogue* during his years as a young student. He was always acutely

[15] Kaila 1928, p. 78.
[16] Kaila 1941, p. 49; here quoted from the English translation in Kaila 1979(2), p. 155.
[17] E.g. ibid.
[18] On Kaila's rejection of this type of monism and on his early position generally on issues in the philosophy of science, see Niiniluoto 1979, pp. 370–409.
[19] Kaila 1911.
[20] Kaila 1915.

aware of the difficulties of stating his monism in a clear and convincing way—and it is probably right to say that he never succeeded in this completely.

Kaila's monism can be said to rest on two pillars which, however, stand apart from each other and do not necessarily support the same edifice of thought. *One* is psycho-physical parallelism or the conviction, in Spinoza's words, that *ordo et connexio idearum idem est ac ordo et connexio rerum*. The other is the unity, at the level of concepts and theories, of the *scientific* picture of the world.[21] The first is, so to say, a metaphysical oneness of the 'stuff of which the world is made'. The second again is a oneness of that which, in Goethe's words 'die Welt im innersten zusammenhält', i.e. the laws and principles governing the *Weltgeschehen* or world process.

A metaphysical monism has to be on its guard against certain charges or dangers.

One is the charge of not being able to overcome metaphysical dualism. If the order of things and that of ideas answer to or reflect one another—for example neural events and sense impressions—how can they be correlated except by mutual causal connection? This problem seems never seriously to have worried Kaila. To him dualism was 'out', once and for all. This attitude is, I think, a reflection of the situation in the philosophy when he grew up—and also long after. He did not live to see the revival of interest in Cartesian dualism and the problems connected with it which we have witnessed in the second half of our century. Kaila would presumably have regarded it an aberration and relapse into already conquered positions.

A danger with monism of which he was acutely aware, however, is that of *reductionism*. If mind and matter are, somehow, *one*, does it not mean that the mind is material as the materialists would have it? This was the charge notoriously directed against Spinoza. But on the other hand, does not monism equally mean that matter is at bottom mental, as the idealists and phenomenalists maintain. This was the accusation which Lenin levelled against the empirio-criticists. Materialism (physicalism) and idealism (phenomenalism), one could say, are the Scylla and Charybdis of a monistic philosophy. Kaila tried to steer his way clear of the two. His monism is emphatically anti-reductionist. As we have already noted, he criticized Mach's phenomenalism. And he certainly was never in danger of the materialistic pit-falls of Haeckel's and Ostwald's philosophy of nature.

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[21] Cf. Kaila 1953, p. 268f.

Even though Kaila's monism can be said to have been in origin a 'metaphysical' vision of psycho-physical parallelism and the unity of mind and matter, his own both earliest and latest efforts to support it with arguments relies on the second of the above mentioned 'pillars' or the idea of the unity of the scientific world-picture. In the 1953 paper where he describes his awakening to philosophy he says in so many words that 'a unitarian or monistic philosophy is—in essence intimately connected with one of the life-nerves of the natural sciences, viz. the tendency to unification of scientific theory formation'.[22] As an example he there gives the Danish physicist Christian Ørsted's discoveries of the connection between 'galvanism', as it was called in former days, and electricity. Ørsted's (and Faraday's) discoveries were the basis of the unified electro-magnetic field-theory later developed by Maxwell. This was one of the greatest achievements of 19th century theoretical physics. Kaila finds the example impressive because Ørsted's research had been guided by a firm conviction of the fundamental unity of all forces in nature—including those governing the mind. Ørsted's work *Aanden i Naturen*—in German *Der Geist in der Natur*—was at the time one of the most influential specimens of the early 19th century tradition of *Naturphilosophie*. Kaila thought of his own work as a latter-day revival of that same tradition.

4

Kaila's earliest attempt to state his philosophic position is a little book of the year 1920 called *Sielunelämä biologisena ilmiönä*, in English 'Mental Life as a Biological Phenomenon'. Kaila was then 30. His earlier published work had been in experimental psychology or else of a belletristic and semi-journalistic nature.

The professed aim of *Sielunelämä* is an attack on the position known as vitalism in biology and psychology. Kaila argues for something he calls 'the mechanistic principle'. It says that the state of a material system at time t depends in a lawful manner solely on the state of the system and its environment at the immediately preceding time-differential.[23] This principle governs *all* phenomena. There is no special causation operating in the realm of the mental or psychic.

The idea of mechanistic causation which Kaila here defends must not be confused with that form of mechanism which maintains

[22] Ibid.
[23] Kaila 1920, p. 10.

that all natural phenomena are 'reducible to the movements of bodies and all natural laws to laws governing those movements'.[24] Kaila is decidedly against this reductionist view.[25] Moreover, he thinks that the laws of chemistry are not reducible to the laws of physics, nor the laws of biology to those of physics and chemistry.[26] But the laws governing psychological phenomena, he thought, are but special cases of laws of biology. On the mental level they manifest themselves as laws of association and reproduction.[27] They reflect underlying physiological principles.[28] This is so because of the strict parallelism which, he assumes, obtains between mental and bodily phenomena.[29] With this Kaila gives to his position in the philosophy of science a metaphysical underpinning. The alternative conception, which he rejects,[30] is that body and mind causally interact.

It is interesting to note here that Kaila later came to abandon the peculiar form of anti-reductivism in the philosophy of science which he defends in *Sielunelämä*. Under the impact of more recent developments in microphysics and molecular chemistry, he rejected the view that the laws of chemistry are 'autonomous' in relation to the laws of physics. For a long time, however, he insisted on the autonomy of biology in relation to the physico-chemical basis of life phenomena.[31] In the end, however, he abandoned this position too—in view of later advances in biophysical science.[32] But these moves of his in a reductionist direction did not mean that he had accepted a mechanistic view either in the classic sense of reducing all natural phenomena to bodies in motion or in the sense of the determinism of his early principle of mechanistic or initial causation. What made the reductivist concessions acceptable for Kaila was his growing conviction that the field-theoretic laws of micro-physics offered a possibility for a unified non-mechanistic natural science. In a polemical paper of the year 1952, directed against what he saw as a revival of mechanistic ideas in the study of self-regulating mechanisms in the then new science of cybernetics, he expresses his conviction that life for its explanation requires a

[24] Ibid., p. 88.
[25] Ibid., p. 90ff.
[26] Ibid., p. 77f. and p. 90.
[27] Ibid., p. 50.
[28] Ibid., pp. 36, 48.
[29] Ibid., p. 137.
[30] Ibid., pp. 10f., 42ff., and passim.
[31] Kaila 1948. For some early doubts, see Kaila 1944(1), p. 135.
[32] Kaila 1952(1)

quantum biology.[33] It is in quantum theory that physics, chemistry, and biology meet and become unified. This rejection of 'mechanism' is equally a rejection of 'vitalism' which had been Kaila's polemical target in the 1920 publication.

5

The mechanism which Kaila professed in *Sielunelämä* reflects the theoretical background of his early work in experimental psychology. He was an adherent of the then current associationist psychology. But soon after, a change took place with him. He became, first acquainted with and then deeply influenced by the new current of *Gestalt*-psychology the leading figures of which were Wertheimer, Köhler, and Koffka. In the most voluminous of all his writings, the synoptic work *Sielunelämän rakenne* ('The Structure of Mind') of 1923, he gave a sympathetic presentation of their views, without yet completely rejecting his earlier associationist position. But a few years later he is fully 'converted' to the *Gestalt*-view. It dominates his second systematic attempt to articulate a monistic philosophy. This is the book *Beiträge zu einer synthetischen Philosophie* of the year 1928. The title is characteristic. *Synthesis*, along with *monism* and *unification*, is what Kaila aimed at.

Gestalt-theory was for Kaila much more than a position in psychology.[34] It is a monistic philosophy *in nuce* which embraces inorganic nature as well as life and mental phenomena. Kaila calls this a 'monism from above'.[35] This is an allusion to the non-additive character of the *Gestalten*. They are wholes governing their parts in the sense that the law for the whole cannot be derived from laws about the parts considered in isolation. The whole, therefore, is not a mere 'sum' of its parts. It has features peculiar to *it*. This point is related to the *theory of emergence*, entertained by Lloyd Morgan and others, to which Kaila makes sympathetic reference in the book.[36]

Kaila's concern in *Beiträge* is basically with the metaphysical and not with the unification of science aspect of monism. And here he also encounters grave philosophical difficulties. They are caused by the anti-reductivist stand which he is anxious to maintain.

Though a professed adherent of psycho-physical parallelism,

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[33] Kaila 1952(2) and Kaila 1952(3), pp. 91–97.
[34] Kaila, 1928, p. 91.
[35] Ibid.
[36] Ibid., p. 115.

Kaila neither wanted to say that mind and matter are 'identical' nor that mental and physical phenomena were of different nature. He approvingly refers to the 'neutral stuff' monism of Avenarius and Bertrand Russell (of that period). He is looking for a conceptual standpoint 'beyond the cleavage in 'mind' and 'matter'' ('jenseits des Gegensatzes von 'Geist' und 'Materie''), he says.[38] But in which sense can the neutrality or unity of the world-stuff be maintained? An idea which he entertains in *Beiträge* is that from the point of view of *quality* everything is mental (*Geist*), but from the point of view of *relation* (or *structure*) everything is material (*Materie*).[39] So in a sense everything that there is is both matter and mind. The thought recurs often in his writing and is even the title of the much later paper in which he criticizes cybernetics.[40] It would be good, he says, to eliminate these two heavily loaded concepts ('diese schwerbelasteten Begriffe') from philosophy.[41] But therewith he has not solved his problem.

As just noted, the mind-matter duality is for Kaila closely tied to the quality-relation or quality-structure distinction. Physical science deals with relations or structures only.[42] This idea resembles thoughts of Carnap and Schlick. But there is no indication that Kaila at this stage of his development had got his inspiration from them.[43] To the extent that one can speak of an influence, it is rather Russell who seems a source, particularly through his Analysis of Matter.[44] The terms of the relations which science clarifies, however, are ultimately things or phenomena of qualitative nature, Kaila thinks.[45] Thus if relation presupposes quality, there is also a sense in which matter can be said to presuppose mind—and the phenomenalistic ghost which Kaila in defense of realism is anxious to exorcize[46] is still lurking in the background.

The problem of the qualities and the possibility of eliminating them from the scientific world-picture remains a *Leitmotiv* throughout Kaila's thinking—and we shall, after a detour in partly other directions, later return to it. In *Beiträge* he proposes, somewhat

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[37] Ibid., p. 78.
[38] Ibid.
[39] Ibid., p. 207.
[40] Kaila 1952.
[41] Kaila 1928, p. 207.
[42] Ibid., p. 15.
[43] There are, however, occasional references to both authors also in Kaila's publications in the 1920s.
[44] Ibid., p. 16 and passim.
[45] Ibid., p. 18.
[46] Ibid., p. 49ff.

tentatively, a solution according to which the qualitative or phenomenal is a field-state (*Feldzustand*) co-ordinated with processes in the living brain.[47] The phenomenal and the physical are, as it were, two modes in which this field-state exists. With this idea we touch the core of psycho-physical parallelism.

If there is parallelism between the phenomenal and the physical then it would seem that there ought to exist non-additivity also on the physical side. Kaila was deeply convinced that this was, in fact, the case.[48] Köhler's theory of 'physical *Gestalten*' in the brain had been an attempt to vindicate this idea. Kaila was fascinated by Köhler's views. But he was also critical of them—in *Beiträge* and later. There is a detailed exposition and criticism in *Beiträge*, terminating in the conclusion that Köhler's supposed neural equivalents of the *Gestalts* were, after all, additive, and not 'holistic', wholes.[49] Non-additivity on the neural side had to be sought 'deeper', in a field-theoretic conception of the microstructures of the brain. Psychology, *pace* Köhler, is still awaiting its Faraday and Maxwell, who, says Kaila,[50] were the '*Gestalt*-theorists' of physics. (A good comparison.)

6

One year after *Beiträge* Kaila published a book with the title *Nykyinen maailmankäsitys*, (in English 'The Contemporary World-View'). It is one of his several semi-popular, synoptic works for a broader academic public. In the Preface Kaila tells the reader that the book is an attempt to present the view of the world at which he had arrived after a decade of research in 'logic, psychology, and philosophy of nature'. For two reasons, he says, he calls this view 'contemporary'. One is that it is based on recent findings in physics, biology, and psychology. The other is that it has affinities with 'some important trends of thought in contemporary philosophy'. He mentions, in addition to Russell and the *Gestalt*-psychologists, also Reichenbach's philosophy of space and time and Carnap's *Der logische Aufbau der Welt*. This last appeared the same year as Kaila's *Beiträge*, in 1928. Kaila immediately studied it. It seems that Kaila

[47] Ibid., p. 79f.
[48] Ibid., Ch. III.
[49] Ibid., pp. 93ff.
[50] Ibid., p. 108. '—die Physik hatte ihre "Gestalttheoretiker" in Faraday und Maxwell,—entsprechend musste es einmal auch in der Psychologie—zu einem radikalen Bruch mit solchen Vorstellungen, denengemäss die konkreten Stücke der phänomenalen "Felder" die Elemente der Psychologie seien kommen.'

had received a copy from the author in return for *Beiträge* and another one of his writings.[51] Later in the year he wrote to Schlick, asking Schlick's assistance with the publication of comments he had written on Carnap's book—possibly together with a reply by Carnap himself. This plan did not materialize, but Kaila's *Der logistische Neupositivismus* which appeared 1930 is presumably an extended version of the comments mentioned in the letter to Schlick.

With these events begins a new era in Kaila's philosophical development. Simultaneous with them is his appointment to the chair in theoretical philosophy in Helsinki, after ten intellectually lonely years as professor of philosophy in the Finnish university at Turku. In 1929 he paid a first visit to Vienna, and he returned there, on Rockefeller grants, 1932 and 1934. He got to know several members of the Vienna Circle and took part in its meetings.

It is surely remarkable that a professor working in what nowadays would be regarded as deadening isolation in a Finnish provincial university[52] could have reached for himself and on his own a position which was on a level with a revolutionary breakthrough in one of the great centres of the intellectual and scientific life of Europe. But it should also be remembered that Kaila always preserved a critical attitude to the movement initiated by the *Wiener Kreis*. He never called himself a logical positivist. For his own position in philosophy he had as early as in the mid-1920's coined the name 'logical empiricism'.[53] This was later adopted also by others who worked in the tradition of the Vienna Circle, but who perhaps thought, with Kaila, that the label 'positivism' was too strongly suggestive of a trend in nineteenth-century philosophy and of reductionist tendencies from which they wanted to dissociate their own position. Nor did Kaila accept for himself the term 'analytical philosophy' when after the war it became current for the several outgrowths of what was originally known as logical positivism. He insisted that his philosophy was *synthetic*, not analytic.

It should also be noted that the idea of 'unity of science', which became another label for the movement starting in Vienna, is rather different from Kaila's idea of a unified scientific view of the world. Kaila's idea was not so much one of a conceptual and methodological unity of the sciences as of their unification through scientific theories—primarily those of physics—of very general

[51] Letter from Carnap to Kaila of 5 June 1928.

[52] Kaila in a letter to Schlick of 28 September 1928: 'In meiner fernen Heimat lebe ich aber in einer ziemlich vollständigen geistigen Isolierung'.

[53] Kaila 1926, p. 35.

scope and applicability. He was looking forward, one could say, to a modern version of the *mathesis universalis* or *scientia generalis* envisaged of yonder by such great scientist-philosophers as Descartes and Leibniz. He was, therefore, as can be expected, also critical of the claims of the Baden-school and of Dilthey of methodological autonomy for the *Geisteswissenschaften* in relation to the *Naturwissenschaften*.[54]

7

In Kaila's literary output the beginning of the new period in his creative life is marked by his monograph *Der logistische Neupositivismus* of the year 1930. Its title contains the earliest occurrence known to me of the term 'neo-positivism' which soon gained currency as a name of the new movement in philosophy. But contrary to what the title may let us expect, Kaila's book is not a presentation of the message of the Vienna Circle. It is an exposition and critique of some main ideas in Carnap's *Aufbau*. (Cf. above p. 71f.). Kaila was convinced of the importance of Carnap's book. He goes as far as to say that it bears a relation to exact thinking in our time somewhat analogous to that of Kant's Critique of Pure Reason to Newtonian science of nature.[55] But he also finds several details of Carnap's conceptual constructions debatable. His criticisms called forth some friendly polemics in correspondence with Carnap and Hempel.[56]

Kaila's own later contributions to the new trend centre almost exclusively round the problem of a 'logical constitution' of reality. They culminate in two books, the maturest I would say in his entire output. The first, from the year 1936, is called *Über das System der Wirklichkeitsbegriffe, ein Beitrag zum logischen Empirismus*; the second from 1941, is entitled *Über den physikalischen Realitätsbegriff, zweiter Beitrag zum logischen Empirismus*. Between and very much in tune with them is another of Kaila's synoptic works, *Inhimillinen tieto, mitä se on ja mitä se ei ole* (in English 'Human Knowledge, What It Is and What It Is Not'). It appeared simultaneously with a Swedish translation in 1939 and was for a number of years used as an advanced text in Finnish and Swedish universities.

Kaila's own constitution theory is original and rather different

[54] Kaila's nearly only contribution to questions of scientific method is Kaila 1930(2).

[55] Kaila 1930(1), p. 9.

[56] Letters from Carnap to Kaila of 28 January 1929 and 12 December 1930. Letter from Hempel to Kaila of 3 January 1931.

from Carnap's. It is much to be regretted that it never attracted the attention internationally which, in my opinion, it amply deserves. To this contributed no doubt the intervention of the war and the 'emigration' of a whole tradition in philosophy from the German to the English-speaking world. The only noteworthy trace which Kaila's contributions have left are with Alfred Ayer, who in his *Foundations of Empirical Knowledge* acknowledged indebtedness to Kaila.[57] Ayer's book was published in 1940.

Carnap's effort in *Aufbau* can with full right be said to aim at a monistic philosophy.[58] But it is a monism of a rather different kind both from what I have here called the metaphysical monism centering round the idea of psycho-physical parallelism *and* from the scientific monism of a unified theory covering all natural phenomena. The Carnapian version of monism could be called conceptual or epistemological, or why not simply, *logical* monism. It entertains an idea of a common ancestral tree for all concepts concerning what is real and of some form of logical interconnectedness of all types of discourse about empirical reality.

Kaila's contributions to constitution-theory are also a facet of his craving for a monistic philosophy. But, as far as I can see, he never uses the name 'monism' for it. Instead another term now becomes prominent in his writings. This is the term *invariance.*

An invariance, roughly speaking, is a lawful order, a regularity or stability, which subsumes different phenomena under a common concept or heading and which enables us to anticipate or predict new phenomena under that same heading. All human knowledge aims at finding invariances, says the opening sentence of *Inhimillinen tieto.*[59] Along with this goes a tendency to smooth out minor deviations from the rule, make the invariance even more perfect than it is in reality. This 'smoothening out' Kaila calls *idealization* or *rationalization.* 'Invariance' and 'rationalization' are two key-terms of his philosophy from the mid-1930's on.

Kaila distinguishes three levels or segments of reality: the phenomenal or φ-level of sensory experience, the physical or f-level of macroscopic things, and the physico-scientific or physicalist level of micro-phenomena and other entities of physical theory. One can also speak of the three layers as three *levels of discourse* about reality.

The relation between the three levels is roughly as follows: the entities of a higher level are conceptualizations of invariances (invariant relations) among phenomena of the next lower level. Thus,

[57] Ayer 1940, p. 248 and *passim.*
[58] Carnap 1928, § 162.
[59] Kaila 1939, p. 13.

to quote his words 'the entire physical theory is nothing more than a precise representation of the more general "higher" invariances of the physical everyday world.'[60] Similarly, the physical objects of our 'everyday world' are conceptual or logical constructs of invariances in the world of perceptions and sensations. Of the way in which the physical world is 'constituted' on the bases of invariances in the flux of sensory experiences Kaila presents an interesting and original theory, the details of which, however, we cannot digress upon here.

In the original logical positivist conception of an *Aufbau* was contained an idea to the effect that all concepts of a higher level of discourse should be, in principle, eliminable in terms of concepts of a lower level and in the last resort of what Kaila calls the φ-level. This entails the translatability of all 'higher type' discourse into the language of sense-experience, the basis of all knowledge.

Kaila's idea, as I understand it, of constituting the higher levels of reality in the terms of invariances among lower level phenomena is not necessarily tied to these views about eliminability and translatability. Kaila, however, initially embraced them too. It therefore came to him—indeed to us in Helsinki, I vividly remember—as something of a shock when Carnap in 'Testability and Meaning' came up with the since notorious difficulties to eliminability caused by disposition concepts. Kaila in *Inhimillinen tieto* tried to overcome Carnap's difficulties—but without success, as Anders Wedberg showed in a review in *The Journal of Symbolic Logic*. As for the related idea of translatability, Kaila accepts it in the 1936, 1939, and 1941 publications although with the obvious limitations imposed by the 'smoothing out' process of rationalization which is characteristic of theory formation in the more advanced sciences.

In the posthumously published *The Perceptual and Conceptual Components of Everyday Experience* which was originally a chapter in his unfinished synoptic work *Hahmottuva maailma*, previously mentioned, Kaila once again returns to the translatability problem. With arguments, somewhat reminiscent actually of those of Carnap in 'Testability and Meaning' he now tries to show that translatability fails between the f-language and the φ-language. It fails, roughly speaking, because the antecedents in conditional sentences which are supposed to give the perceptual meaning of a sentence about physical objects, necessarily will have to be themselves (a kind of) physical sentences.[61]

[60] Kaila 1941, p. 13. Quoted from the English translation in Kaila 1979(2), p. 132.

[61] Kaila 1979(2), pp. 294ff.

8

A problem which has presented notorious difficulties to a monistic constitution-theory is the problem of *the reality of other minds*. According to logical empiricism, Kaila says,[62] 'the objective meaning of statements about the other-mental consists in statements about the behaviour (in the broadest sense of the word) of other persons.' A statement about another person's mind—about what he senses or feels or thinks, etc.—is, somehow, equivalent with a statement about (what is going on in) his body. This may be true; but it immediately also gives rise to an intriguing problem. Kaila posed it in clear terms already in his examination in *Neupositivismus* of Carnap's position in *Aufbau*. Here he says:[63]

> The question now is whether this equivalence is *analytic*, i.e. whether that equivalence is a *definition*, namely the only possible definition of the 'other-mental states'. If the answer is affirmative the statements about the mental states of others have the same meaning as the statements about certain expressive processes;—This would amount to an epistemological foundation of an extreme 'behaviourism'. Yet, according to customary theory of knowledge, this question is certainly *not* to be answered affirmatively.

In *Neupositivismus* Kaila makes a somewhat half-hearted attempt to criticize the 'customary theory' and rests content with the fact that from the point of view of constitution-theory the equivalences in question *have to be analytic*. In *System der Wirklichkeitsbegriffe* six years later the difficulty is somehow slurred over.[64] He suggests, vaguely, an alternative to the analytic equivalences of logical behaviorism. This alternative is to regard the experienced other-mental—for example the pain we see in a contorted face or the contempt which we recognize in another person's glance—as an *Urphänomen* or primitive phenomenon, belonging to our sensory experience or φ-world.[65] For Kaila the psychologist the reductivist step involved in radical behaviourism always seemed an illicit and unrealistic simplification.

In *Inhimillinen tieto* the problem of other minds is dealt with at greater length. Here, for the first time, he considers the equivalents as obtaining between mental phenomena and *brain-states*. The question whether these equivalences are analytic or synthetic is, however, not raised. But the problem tormented him—and in two

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[62] Kaila 1936. Also in Kaila 1979(2), p. 120.
[63] Kaila 1930(1), p. 33. (Quoted from Kaila 1979(2), p. 17).
[64] Kaila 1936, p. 96ff., (Kaila 1979(2), p. 118ff.)
[65] Ibid., p. 100. (Kaila 1979(2), p. 121.)

papers from the year 1942 he made a serious attack on it. One paper is called 'Physikalismus und Phänomenalismus', the other 'Reaalitiedon logiikka' which in English means the logic of our knowledge of reality.

In these papers Kaila accepts what might be called a two-language solution—hinted at already by Carnap in *Aufbau* and later becoming current under the impact of 'physicalism' as an alternative to the 'phenomenalism' of early logical positivism. Whereas the latter locates the basis of knowledge, i.e. the Constitution-System, in Kaila's φ-world, the former locates it in the f-world. From the point of view of physicalism, Kaila says,[66] the behavioural equivalences are definitional, analytic; from the point of view of phenomenalism, however, they are empirical, synthetic. Physicalism may be said to have the advantage of overcoming the asymmetry between what in German is named with the terms 'Eigen-psychisch' and 'Fremd-psychisch' which gives to a phenomenalist constitution of the world its solipsistic flavour. But this advantage is gained at the expense of an incompleteness, viz. of having a language 'in der man aber das eigentliche Fundament unserer gesamten Wirklichkeitsauffassung nicht beschreiben kann, nämlich die—phänomenologische "Erlebniswelt" in ihrer qualitativen Eigenart'.[67]

9

The two papers mentioned mark the end of an era in Kaila's search for a monistic philosophy. It is the era of his wrestling with the Constitution-Problem. It is also the time of his closest alliance with the movement in philosophy which had its origin in the Vienna Circle and continued in various forms of 'analytic philosophy'. Later Kaila is again the lonely wolf he was before his encounter with the logical positivists.

I think, although this must remain a conjecture, that when Kaila in his 1953 description of his philosophic awakening speaks[68] of a 'detour'—this is how I translate the Finnish 'syrjätaipale'—which lasted some ten years in his life-long efforts to articulate his monistic vision he has in mind the period from roughly 1930 to the early 1940s. The impression of a 'detour' gains force from the fact that with the two papers mentioned of the year 1942 he is back at

[66] Kaila 1942(2), p. 82ff.
[67] Kaila 1942(1), p. 123.
[68] Kaila 1953, p. 261.

substantially the same problems with which he was wrestling in *Beiträge*, i.e. the problem of monism both in its 'metaphysical' and its 'scientific' variant.[69]

Kaila clearly noted and emphasized that the middle one of the three layers of reality he had distinguished, viz. the physical level, enjoys a certain 'privileged position' in relation to the two extreme ones, the phenomenal and the physicalistic level. Our 'natural language' is predominantly an f-language, the predicates and relations of which apply to physical things and events. Yet the basis of our knowledge is sensory experience which is described in the φ-language. This means 'dass die natürliche Sprache auf einer verhältnismässig hohen Stufe des "logischen Aufbau der Welt" *erst einsätzt*; die unterhalb dieser Stufe gelegenen Daten—bleiben dabei unberücksichtigt; die natürliche Sprache ist zu einer Beschreibung derselben von Natur aus ungeeignet.'[70]

It is a merit of Kaila's to have seen that the problem of the relationship between the f-level and the φ-level is not just a question whether physical concepts can be 'constituted' on the basis of phenomenological concepts or physical language 'translated' into phenomenological language. The question is rather whether there is such a thing as a 'phenomenological language' at all. When wrestling with this Kaila comes close to the thoughts which made Wittgenstein, after his return to philosophy in the late 1920's, abandon the idea of a basic phenomenological language. There is some resemblance also with the shift from a phenomenalist to a physicalist position which took place among logical positivists in the early 1930s. But Kaila's critical doubts concerning the φ-world went deeper than theirs. They are foreboded in the two 1942-papers and further developed in two papers from the year 1944. As in the case of the twin-papers of 1942, one is in German, the other in Finnish. The first is called 'Logik und Psychophysik', the title of the second would be in English 'The Problem of the *Gestalt*'. The concluding pages of *Tankens oro*, also published in 1944, summarize the position then reached by Kaila.

The contrast phenomenal-physical is for Kaila related to the dualism quality-structure or quality-relation which had intrigued him in *Beiträge*. The φ-language is the language of (sensible) qualities, the f-language a language of structures. But any effort to give a phenomenological analysis or description of what we really

[69] An alternative interpretation is that Kaila had in mind the roughly ten years of his tenure of the professorship in Turku. The Finnish word mentioned in the text gives some support also to this interpretation.

[70] Kaila 1944(2), p. 108.

'sense' seems to fall back on a language of structure. This is best illustrated by the *Gestalt*-qualities:

Gestalt-qualities are, for example, the seen straightness of a line or flatness of a surface, or the separation and grouping of lines in a complex drawing. Any attempt to 'analyse' the quality will refer to some relational invariances in the physical material—line, surface, drawing—in which the *Gestalt* is perceived. There simply *is* no 'pure' phenomenological language available in which the quality can be described. This means, Kaila says,[71] that the very notion of '*Gestalt*-quality' is self-contradictory, a 'hybrid' between φ- and f-reality, and therefore something which, in a sense, does not even 'exist'. What the attempted phenomenological analysis gives us is what Kaila calls[72] a 'semantic description' referring to the 'meaning' which the qualitatively experienced has in physical reality,—for example the impression of flatness of a surface as a sign of the fact that any line which has at least two points common with the surface falls entirely in the surface.

What we call a *Gestalt*-quality is, in Kaila's view, the experienced equivalent of a neural reaction on the relational invariances in a given sensational manifold. 'Die "Gestaltqualitäten"', he says,[73] 'sind die Korrelate jener Reaktion; in ihnen haben wir die betreffenden Invarianten als "unmittelbar erlebte" Phänomene.'

In still later writings from the 1950s[74] and a posthumously published fragment from the unfinished *Hahmottuva maailma*,[75] Kaila extends these observations on *Gestalt*-phenomena to qualities generally. An experienced colour-quality, for example, is a diffuse, unanalyzed sign referring to a place in a relational system of, say, degrees of luminosity, saturation, and shade. Its phenomenological analysis is a 'semantic description' of this place in the f-world. Kaila supports his view with a reference to the defective verbal reactions to colours of people who suffer from so-called 'colour amnesia'. This shows, he thinks, that the normal use of colour-words makes latent reference to the relational structure of colours as physical phenomena.

Kaila's efforts in the last 16 years of his life to deal with the relation between the phenomenal and the physical, quality and structure, the perceptual and the conceptual, seem to me a very important but sadly neglected contribution of his to the philosophy

[71] Ibid., p. 107.
[72] Ibid., p. 109.
[73] Ibid., p. 99.
[74] Kaila 1953, p. 274.
[75] Kaila 1979(1), p. 451ff.

of psychology. Philosophers who write about these matters usually have but little schooling in empirical and experimental psychology. Psychologists again seem too often to be blind to the conceptual, i.e. philosophical, dimension of their subject. Specialization in the fields has made the combination which Kaila represented almost unique in our time.

I shall not try to pass verdict on Kaila's metaphysics of the body-mind or of the quality-structure relation. I do not feel in every respect competent for the task. Many of his thoughts remain for me unclear. But even if he did not succeed in giving a precise sense to the thought that 'everything is matter and everything is mind' he certainly succeeded in showing that the body-mind *separation* is an unfortunate instance of what he in later writings calls 'the schematism of dichotomies'[76] and that the two Cartesian substances are *conceptually* inseparably bound together. It does not seem to me certain that a monistic philosophy can go much farther to their unification.

10

Towards the end of his Kaila tended more and more to view his own work in philosophy as a continuation and revival of the Romantic tradition of *Naturphilosophie*. (Cf. above p. 67). This is already apparent from the title of the great work in three volumes which he began to plan in the mid-1950s. It was to be called *Terminalkausalität als die Grundlage eines unitarischen Naturbegriffs, eine naturphilosophische Untersuchung*. Only the first volume, *Terminalkausalität in der Atomdynamik* materialized (1956). For the second, *Terminalkausalität in der Biodynamik*, he had already prepared a vast material of notes. The third, uncommenced, volume he would presumably have called *Terminalkausalität in der Neurodynamik*.

'Terminalkausalität' is Kaila's name for a unifying explanatory principle. Its precise meaning is difficult to gather from his writings. There is a touch of finality or teleology with the notion of 'terminal causation'—but it should certainly not be associated with ideas of purposiveness or striving for a goal in natural processes. The principle is in some way an 'holistic opposite' of the mechanistic principle or determination through initial causation which Kaila in his early work of 1920 had thought of as a unifying explanatory principle valid for all nature. Initial causation may still be important for explaining and predicting macrophenomena. But

[76] Ibid., p. 455.

in the micro-world of atoms, living cells, and neurons terminal causation reigns. And it is in this world that, according to Kaila, the innermost secrets of a unitary conception of nature are hidden.

The source of inspiration of Kaila's striving for a 'unified theory' was, of course, the grand achievements of relativity and quantum physics. In 1950 he had published *Zur Metatheorie der Quantenmechanik* and the title of his last complete book, which he did not live to see in print, would be in English 'The Einstein-Minkowski Theory of Invariance. Investigations into its Logico-Epistemological Nature and its Significance for a Philosophy of Nature'.

It almost goes without saying that Kaila's program was too ambitious for a single man's efforts to be crowned with success. But we can appreciate it as a grandiose vision of the goal to which Western exact science has been striving for the past four or five hundred years.

As a motto for his first effort to state his philosophic position, the *Sielunelämä biologisena ilmiönä* of 1920, Kaila used the following quotation from Mach's *Mechanics*: 'Die höchste Philosophie des Naturforschers besteht darin eine unvollendete Weltanschauung zu ertragen'. To endure an unfinished world-view may be the plight of all deep and serious thinking. To accept this is doubly difficult for one whose craving for a 'unified theory' never yields to compromise with recalcitrant facts.

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V

WITTGENSTEIN AND THE TWENTIETH CENTURY

I have called this essay 'Wittgenstein and the Twentieth Century'. It is not my intention, however, to discuss how Wittgenstein has impressed and changed thinking in our century; nor shall I discuss the influences and impulses which he may have received from other philosophers. What I wanted to do is something which is more hazardous and indefinite—and in the opinion of many perhaps not very important either. I wanted to relate Wittgenstein to a prevailing climate of opinion or cultural situation, to something which may also be called the 'moods' or *Stimmung* of a time. I have made an effort in this direction once before.[1] Here I wanted to follow it up with thoughts on how Wittgenstein's rejection of the civilization of contemporary Western society reflects a basic attitude of his to life and on how this attitude carries both his earlier and his later work in philosophy.

1

A dominant feature in the spiritual physiognomy of the twentieth century is Modernity. It has become recognized under that name largely in retrospect and in contrast to tendencies which either are critical of it or champion a new, 'post-modern' mood of the time.

Modernity, thus conceived, is our legacy of the Enlightenment and the French Revolution. It is the Age of Reason matured to become an age of science and technology, of an industrial mode of production, and of democratic forms of government. In origin it was an optimistic mood. It cherished a vision of linear and unlimited perfection and progress towards a *regnum hominis* of free and equal men. The yoke of superstitious beliefs being lifted, also that of despotic government would never again be allowed to oppress man.

This original mood was partly reflected in but partly also reinforced by the ideas of evolution which were characteristic of 19th

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[1] In von Wright 1978.

Thinking in the Human and in the Natural Sciences'). In *Juhlakirja Yrjö Hirnin kuusikymmenvuotispäiväksi 7.12.1930*. Otava, Helsinki 1930 (2).
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——. 'Introduction'. In Kaila 1979 (2). A few passages from this paper have been incorporated, more or less verbatim, in the present essay.

V

WITTGENSTEIN AND THE TWENTIETH CENTURY

I have called this essay 'Wittgenstein and the Twentieth Century'. It is not my intention, however, to discuss how Wittgenstein has impressed and changed thinking in our century; nor shall I discuss the influences and impulses which he may have received from other philosophers. What I wanted to do is something which is more hazardous and indefinite—and in the opinion of many perhaps not very important either. I wanted to relate Wittgenstein to a prevailing climate of opinion or cultural situation, to something which may also be called the 'moods' or *Stimmung* of a time. I have made an effort in this direction once before.[1] Here I wanted to follow it up with thoughts on how Wittgenstein's rejection of the civilization of contemporary Western society reflects a basic attitude of his to life and on how this attitude carries both his earlier and his later work in philosophy.

1

A dominant feature in the spiritual physiognomy of the twentieth century is Modernity. It has become recognized under that name largely in retrospect and in contrast to tendencies which either are critical of it or champion a new, 'post-modern' mood of the time.

Modernity, thus conceived, is our legacy of the Enlightenment and the French Revolution. It is the Age of Reason matured to become an age of science and technology, of an industrial mode of production, and of democratic forms of government. In origin it was an optimistic mood. It cherished a vision of linear and unlimited perfection and progress towards a *regnum hominis* of free and equal men. The yoke of superstitious beliefs being lifted, also that of despotic government would never again be allowed to oppress man.

This original mood was partly reflected in but partly also reinforced by the ideas of evolution which were characteristic of 19th

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[1] In von Wright 1978.

century scientific thought. They range from the historical linguistics of a Rasmus Rask and Jacob Grimm, through Charles Lyell's biography of the earth, to Darwin's theory of the origin of species and descent of man. These scientific achievements encouraged the beliefs and sentiments, epitomized in the positivist philosophy of Auguste Comte and his followers, the evolutionist progressivism of Herbert Spencer, and also, though with more ambiguous and sophisticated overtones, in Hegel's phenomenology of the spirit.

This climate of opinion, here briefly characterized, prevailed not least in late Victorian and Edwardian England. It enjoyed an exceptionally intense 'Indian Summer' of creative intellectual talent in pre-first-war Cambridge where the young Wittgenstein came to study logic with Bertrand Russell.

The First World War gave a shock to this mood but it by no means crushed it. The war could also be viewed as a great convulsion needed for breaking the fetters of unreason in which reactionary forces of the past had tried to hold back humanity on its way to Modernity. To many the revolution in Russia seemed the continuation and final breakthrough of the spiritual forces first let loose in France more than a century earlier.

The so-called modernistic movements in architecture, art and literature testify to this renewed optimism of the post-first-war period. And so do the efforts to create a global international organization to secure peace and progress for a world made—as said a slogan of the time—'safe for democracy'.

This rejuvenated Modernity had one of its most consequential and serene reflections in the philosophic trend known as logical positivism. I say 'consequential', thinking of the repercussions which this trend has had on philosophy throughout the century. And I say 'serene', thinking of the rationalist ethos and consciousness of a message which animated many of its early protagonists. This feeling of unisonity with a tune of the times is perhaps nowhere reflected as movingly as in Carnap's Foreword to *Der logische Aufbau der Welt*.[2]

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[2] Carnap 1928, p.v.f.: Wir spüren eine innere Verwandtschaft der Haltung, die unserer philosophischen Arbeit zugrunde liegt, mit der geistigen Haltung, die sich gegenwärtig auf ganz anderen Lebensgebieten auswirkt; wir spüren diese Haltung in Strömungen der Kunst, besonders der Architektur, und in den Bewegungen, die sich um eine sinnvolle Gestaltung des menschlichen Lebens bemühen: des persönlichen und gemeinschaftlichen Lebens, der Erziehung, der äusseren Ordnungen im Grossen. Hier überall spüren wir dieselbe Grundhaltung, denselben Stil des Denkens und Schaffens.—Der Glaube, dass dieser Gesinnung die Zukunft gehört, trägt unsere Arbeit.' (See also below, the essay 'The Myth of Progess', p. 208)

I vividly remember how his words moved me as a young student in Helsinki in the mid-1930's—and I think we were fortunate in my country to have received our inspiration in philosophy from a charismatic teacher, Eino Kaila, who saw himself in the vanguard of a radically new way of thinking.

The optimistic mood apart, what was new about this thinking were above all two things. One was the strong emphasis on logic as the core and center of philosophy. The other was the alignment with science, the feeling that philosophy too had, at long last, attained the status of a *Wissenschaft*.[3] 'Wissenschaft' should then be understood in the traditional English sense of the word 'science', comprising mathematics and the natural sciences, rather than in the broader German sense.

It is worth noting here that the idea of the natural sciences setting the pattern also for philosophic thinking has deeper roots in Austrian than in German or even in French or English philosophy. Schlick was successor to the chair once held by Mach in Vienna, and the Wiener Kreis could be called an inner circle of the Ernst Mach Society which introduced the *Kreis* to the world in its manifesto *Wissenchaftliche Weltauffassung*. But already long before that, Brentano had proclaimed in his *Habilitationsschrift* of 1866 that 'vera philosophiae methodus nulla alia nisi scientiae naturalis est'.[4] The key position of Brentano and his several pupils in the development of philosophy in our century has with time become increasingly obvious when the ties of the 'new philosophy' to the phenomenalistic sensualism of Mach have gradually loosened, and the current originating as logical positivism has broadened into the mighty stream of analytic philosophy.

In spite of the many tributaries which have, in the course of the years, emptied their waters into this river, I think it is right and illuminating to call analytic philosophy the mainstream of philosophic thinking in this century. In all its heterogeneity it retains the two features which I already mentioned as typical of its origin: the emphasis on logic and the alignment with science. It is, in short, the philosophy most characteristic of a culture dominated by scientific rationality.

As is well attested, the influence of Wittgenstein's *Tractatus* on the Vienna Circle was profound. The authors—Carnap, Hahn, and Neurath—of the 'manifesto' hailed Wittgenstein, together with

[3] An early forceful expression of this view of 'the new philosophy' is Russell 1914. It is interesting to read it in conjunction with the writings from the years of the flowering of the Vienna Circle.

[4] Quoted from Haller 1981.

Einstein and Russell, as the leading representative of a 'scientific view of the world' or, with its more telling German name, 'eine wissenschaftliche Weltauffassung'.[5]

That this characterization is profoundly untrue of Wittgenstein's *Denkart* is obvious to every serious student of his philosophy. Yet it is even today quite common to label Wittgenstein, if not a 'logical positivist' so at least an 'analytic philosopher'. There are deeper reasons for this misunderstanding than just the difficulties of getting rid of a label once attached. If Wittgenstein is not an analytic philosopher, what *kind* of philosopher is he then? This question certainly cannot be answered in the terms of current classifications. He is not a phenomenologist or hermeneuticist, nor an existentialist or hegelian, least of all is he a marxist.

It is, moreover, not too difficult to reinterpret Wittgenstein's thinking so as to fit the analytic mould. He said in the *Tractatus* that 'Philosophy is not one of the natural sciences' (4.111). But nor would the logical positivists have claimed *that* to be the case. He also said that philosophy is 'something which stands above or below, but not beside the natural sciences' (*ibid.*). How does this differ from Carnap's view that philosophy is the logical syntax of the language of science?[6] Is not the logic of science exactly something which stands 'above' or 'below' but not 'beside' the sciences themselves? And Wittgenstein said many more things about what philosophy is and what it is not which can without too much ado be reconciled with the opinions both of earlier and later so-called analytical philosophers. Yet there are, I think, *profound* differences.

2

There had existed throughout the 19th century undercurrents which did not share the optimistic belief in progress through modernity and did not vest hopes for the future of man in the further development of science and technology. Kierkegaard's opposition to Hegel and system-philosophy, particularly in his *Concluding Non-Scientific Postscript*, struck an early note of discord. Dostoyevsky's *Notes from the Underground* dug deep into those dark layers of the

[5] Hahn 1929, p. 54: 'Einstein, Russell und Wittgenstein seien hier als diejenigen unter den führenden Denkern der Gegenwart genannt, die die wissenschaftliche Weltauffassung am wirkungsvollsten in die Öffentlichkeit vertreten und auch stärksten Einfluss auf den Wiener Kreis ausüben.'

[6] Carnap 1934, pp. iii–v: "Philosophie wird durch Wissenshaftslogik—ersetzt; Wissenschaftslogik ist nichts anderes als logische Syntax der Wissenschaftssprache.'

human soul which might one day erupt in violent protest against a rationally organized, progressive society. The climax of 19th century critique of civilization is, of course, the 'Umwertung aller Werte' attempted by Nietzsche. Of Nietzsche Wittgenstein once said that he had perhaps touched on 'problems of the intellectual world of the West' which no other philosopher had 'tackled and wrestled with' and which could only be written about 'in the language of prophesy, comprehensible to the fewest'.[7]

The mood of these writers is not necessarily pessimistic. But it is a sombre mood of self-reflexion and questioning of dominant currents of their time, as they saw them. And these writers, we know, were more congenial to Wittgenstein than any 19th century philosopher of the established style. From his early years he distanced himself from and condemned modernity in all its philistine manifestations.

It is but natural that the cataclysm of the first War should have nourished this mood and added to it apocalyptic overtones—just as it is also understandable that the same disasters were hailed by others as having created a *tabula rasa* for the ground-work of a brave new world. The doomsday prophet *par excellence*, is, of course, Spengler.

Wittgenstein has mentioned Spengler as one of those who had influenced him. He says he took over from Spengler a line of thinking and seized on it with enthusiasm for his own work.[8] This, and the fact that Spengler's name occurs on the list—beginning with Boltzmann and ending with Sraffa—of persons, whom Wittgenstein recognized as influences, does not mean, however, that Spengler had deeply influenced the mood in which Wittgenstein viewed his times. It means, in the first place, that he had received from Spengler's *Untergang* the germ of one of the pervasive ideas of his later philosophical thinking. This is the notion of conceptual family resemblances. It is quite another thing that Wittgenstein *also* shared the apocalyptic view of Spengler's. With the years, this even deepened to a hatred of our decaying civilization and a wish for its destruction. 'Do you really think that Europe needs another great war?', I once asked him in the twilight of prewar sentiments in 1939. 'Not one, but two or three', was his reply. This shook his young interlocutor deeply and seemed to him *then* unintelligible.

The apocalyptic views of Wittgenstein are best reflected in some of the 'general remarks' he wrote in the late 1940s. But the best and

[7] Wittgenstein 1980, p. 9.

[8] Wittgenstein 1980, p. 19. In German 'Ich habe sie (sc. die Gedankenbewegung) nur sogleich leidenschaftlich zu meinem Klärungswerk aufgegriffen'.

fullest articulation of his attitude to Modernity is of much earlier date. I am thinking, in particular, of the sketches of a Foreword written in 1930 for a projected work. A version was printed with the *Philosophische Bemerkungen*, the earliest of Wittgenstein's prepared typescripts after his return to philosophy in the late 20s, published in 1953.[9] The book for which it was written cannot, however, have been *it*. More likely, the Foreword was meant for the great and externally more accomplished work to which Wittgenstein's literary executors used to refer as the 'Big Typescript' and which—most regrettably—to this day has not been published in its entirety.

Wittgenstein's early sketches for a Preface should be read in juxtaposition to Carnap's Preface to *Aufbau*. They afford an impressive and nice illustration to the contrast between the protagonists and the critics of the spirit of Modernity. Although we have no documentary evidence, the thought is close at hand that Wittgenstein wrote his words in reply to Carnap's. The way the two prefaces match seems to me too good to be a result of sheer coincidence.

3

The Hungarian philosopher and historian of ideas Christoph Nyíri sees in Wittgenstein a representative of the neo-conservative trend which rose to prominence in the 1920s, chiefly in the German speaking world.[10] It continues an earlier conservatism which had taken a critical view of the rationalist spirit of the Enlightenment and of the progressive democratization and secularization of 19th century society. An early exponent of this type of conservative thinking is the great Austrian poet Grillparzer. Nyíri points to the

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[9] Wittgenstein 1980, p. 6f. 'Dieser Geist ist—ein anderer als der des grossen Stromes der europäischen und amerikanischen Zivilisation. Der Geist dieser Zivilisation, dessen Ausdruck die Industrie, Architektur, Musik, der Faschismus und Sozialismus unserer Zeit ist, ist dem Verfasser fremd und unsympatisch.— Unsere Zivilisation ist durch das Wort 'Fortschritt' charakterisiert. Der Fortschritt ist ihre Form—. Ihre Tätigkeit ist es, ein immer komplizierteres Gebilde zu konstruieren.— Es interessiert mich nicht, ein Gebäude aufzuführen, sondern die Grundlagen der möglichen Gebäude durchsichtig vor mir zu haben. Mein Ziel ist also ein anderes als das der Wissenschaftler, und meine Denkbewegung von der ihrigen verschieden.' See also 'The Myth of Progress', below p. 208f.

[10] See in particular his essay 'Konservative Anthropologie: Der Sohn Wittgenstein' in J.C. Nyíri, 1988. The essay opens with the words (p. 91): 'Ludwig Wittgenstein begann um die Wende der zwanziger-dreissiger Jahre des 20. Jahrhunderts jenen Ideenkreis auszuarbeiten, den man heute, rückblickend, wahrscheinlich als die tiefste und umfassendste Grundlegung vom konsevativen Bild des Menschen bezeichnen kann.'

deep impression Grillparzer had made on Wittgenstein and which anybody knowledgeable in literature cannot fail to notice throughout his writings also in places where there is no mention of Grillparzer's name.

I have great respect for Nyíri's attempt to locate Wittgenstein on the cultural map. I think it in many ways illuminating of Wittgenstein's attitudes and thoughts. But I also have reservations.

The label 'conservatism' does not seem to me appropriate—*pace* Nyíri's own observations on its ambiguities.[11] Wittgenstein was much more anxious to combat and distance himself from a prevailing climate of opinion than to work for the restoration of one which was already fading. He is as little nostalgic in his thinking as are Dostoyevsky or Nietzsche. Moreover, the philosopher who wrote 'I destroy, I destroy, I destroy'[12] was not alien to the thought that something new could be built once the heap of rubble of a decaying culture had been cleared away. Not unlike some radicals of the left he appears to have seen something hopeful in the drastic sweeping away of an obsolete social order which had taken place in Russia. His plans of settling in the Soviet Union can be viewed in this light too. Among his Cambridge friends in the 1930's many had a pronouncedly marxist orientation. The only periodical which I have seen him reading and not frowning upon was 'The New Statesman and Nation'—much more in tune with the tastes of left intellectuals than with those of apolitical conservatives.

Just as Wittgenstein's philosophy defies classification in relation to movements and trends in 20th century thought, so also is his attitude to modernism and its critics far from univocal. It may even appear to us loaded with paradox and contradiction.

4

Allan Janik, co-author of the book *Wittgenstein's Vienna* and another writer who has tried to place Wittgenstein in a broader cultural setting, has criticized Nyíri's diagnosis. He objects above all to the way in which Nyíri exploits for his purposes two key notions in Wittgenstein's later philosophy. These are the notions of rule-following and form of life. Nyíri tries to link them to political and social conservatism. This does not seem to me right. Janik's critical points against Nyíri I find well taken here.

Janik suggests that it is characteristic of Wittgenstein that 'he

[11] Nyíri 1988, p. 104 ff.
[12] Wittgenstein 1980, p. 21.

wished to separate his philosophizing from his personal beliefs' and that, accordingly, he 'took great pains to separate his cultural pessimism from, say, his view of meaning and thinking.'[13] If this is right, it would be futile to look for a connection between Wittgenstein's philosophy and the mood in which he viewed his times.

One could go one step further and say that also the modernism and rationalist optimism, characteristic of many of the leading logical positivists, bears only a contingent relationship to *their* philosophy. It is true that neither Wittgenstein nor the positivists (with the sole exception of Neurath) elaborated their views of culture, history, politics, and society in the discursive form of philosophical or scientific writings. Their *Weltanschauung* shines forth only in various *obiter dicta*; in the case of the positivists the Vienna Circle manifesto or Carnap's Preface to *Aufbau*; in the case of Wittgenstein some 'aphorisms' in the *Tractatus*, the prefaces to works not published in his lifetime, and a good many 'general remarks' scattered throughout his writings. (Hither may also be counted the notes on Frazer's *The Golden Bough*.)

The truth of these observations notwithstanding, I disagree with Janik's suggestions above. Fichte's famous words 'Was für eine Philosophie man wählt, hängt davon ab, was für ein Mensch man ist', may not be interestingly applicable to the average, mediocre, academic philosopher. But for the great ones it is, I think, profoundly true. Their philosophy reflects their personality, and *vice versa*. And if personalities differ profoundly, so will the philosophies. Therefore it is not futile to look for the way in which Wittgenstein's thought can be said to reflect his view of life.

5

A different attempt from Janik's to resolve the puzzles here is made in Professor Stephen Hilmy's book *The Later Wittgenstein*. It is another one of those not too many writings which discuss Wittgenstein's thought in relation to intellectual currents of the time. (A virtue of Hilmy's work is that it bases its argumentation directly on Wittgenstein's *Nachlass* and does not confine it to the printed sources only.)

Hilmy's view is that Wittgenstein's later philosophical deliberations should be seen 'as a struggle against dominant intellectual trends in our modern civilization'[14] and *also* 'against this trend as it

[13] Janik 1985, p. 130.
[14] Hilmy 1987, p. 190.

manifested itself in his own earlier philosophy'.[15] Thus, according to Hilmy, Wittgenstein of the *Tractatus* was himself 'caught up in the scientific current of the times'[16] and had 'succumbed to the scientific intellectual trends of the day.[17] Simplifying a little, one could then say that the logical positivists were right when they saw in the *Tractatus* an ally to their own philosophy, and that it is only the later thinking of Wittgenstein which reflects his *Abstandnahme* from that intellectual mood of the times to which I have here alluded with the term 'modernity'.

There is certainly *some* truth in Hilmy's view. At least two arguments can be given in support of it. One is so to speak 'biographical'. It points to changes in Wittgenstein's life. The Wittgenstein of pre-war Cambridge, a student of Frege's and Russell's logic, was in many ways a different man from the Wittgenstein who returned to Cambridge in the late 1920s. His experiences from the years of the war had deeply affected his sentiments. After return from captivity he renounced his fortune and withdrew to a life of Tolstoyan simplicity in remote countryside villages. His life later at Cambridge and in his hut in Norway is stamped by the same austere frugality. The professor of philosophy refused to let himself be integrated in the academic establishment of one of the world's most distinguished universities. This was Wittgenstein's mood when he met the philosophers of the Vienna Circle,—but it was a different mood from the one in which he had first conceived the ideas for the work which meant so much to them. The Wittgenstein who had radically changed his ways of life was now also on the road to a new philosophy which was to become less and less congenial to most of his former admirers.

The other argument in support of Hilmy's view trades on the difference between the philosophy of the *Tractatus* and that of the *Philosophische Untersuchungen*, between the philosophies sometimes referred to simply with labels 'Wittgenstein I' and 'Wittgenstein II'. The first belongs in the atmosphere of logic and the science-oriented thinking of the positivists and later the analytic philosophers. The second is deeply infected by doubts about the influence of scientific rationalism on our thought and our lives.

What I should like to do now is the following: Against Janik I shall try to show that there is a close correspondence between Wittgenstein's thought and that which I have called his 'mood'. To

[15] Ibid., p. 192.
[16] Ibid., p. 194.
[17] Ibid., p. 210.

this end we must look towards features of his personality which lay deeper than those habitually referred to as his 'cultural pessimism' and which remained substantially unaffected by external changes in his way of life. Against Hilmy I shall try to show that there is a continuity in Wittgenstein's thought which links his 'two philosophies' in the very way which makes them correspond to a fundamentally unchanged attitude to life. This connecting link is found, not surprisingly, in Wittgenstein's conception of philosophy and his attitude to language.

6

Wittgenstein's intellectual and moral personality must be understood against the background of the society in which he grew up. He was a son of the late Habsburg Empire. This was a very peculiar socio-political construct. The multinational and multilingual state was in many ways an obsolete phenomenon in a Europe *then* on its road towards democracy and industrialization in the frames of consolidated national states. It was a reactionary bulwark against progressing modernization. At the same time it appears to us today strangely modern, a forecast of what may come in a Europe *now* in a process of integration with national borders breaking down and a new mixing of languages and nationalities in the offing.

Of this 'kaiserliche und königliche' construct—for which the author of *Der Mann ohne Eigenschaften* invented the name with ironic Greek overtones 'Kakanien'—was characteristic a hypocrisy and doubleness of morality which, though certainly not unique in history, was perhaps unique in the Europe of the 19th century. Or how else shall one understand that in this atmosphere of conventional half-truth and insincerity there arose such a strong reaction against it, a violent passion for truthfulness and purity, unsparing efforts to debunk the illusions and lay bare the underground of the human soul? We witness this reaction in the puristic architectural language of Adolf Loos, in the stern atonality of Schönberg's music, in the searching cultural criticism of authors like Hermann Broch and Robert Musil, and in the apocalyptic irony of Karl Kraus. In the same circle also belongs the greatest debunker of all, Sigmund Freud.

It is against this background in Austrian *Geistesgeschichte* that we have to understand Wittgenstein: his passion for truth and sincerity and his longing for pure and simple forms of life. Wittgenstein had a rare sense for detecting or, to use a favourite world of his,

'smelling' even the slightest trace of conventional lie, untruthfulness, artificiality and pretense in the people whom he met. This made relations with him strained, in some cases even unbearably difficult, for those who had the privilege of coming close to him personally. The statement holds true equally of the Wittgenstein who came to pre-war Cambridge to attend Russell's lectures and of the one who returned there in 1929 after ten years of voluntary withdrawal from the world. 'Are you thinking of logic or of your sins' Russell asked him in a memorable conversation.[18] 'Of both' was Wittgenstein's reply. Paraphrasing a word by Ibsen—certainly well known to Wittgenstein—one could say that philosophical thinking was to him a perpetual holding of doomsday with himself.

To the best of my knowledge, Wittgenstein is the only one among those twilight figures mentioned of Musil's 'Kakanien', whose craving for honesty prompted him to radical efforts to change his (outward) life. Here the influence of Tolstoy on Wittgenstein must be rated high. Tolstoy was at home in a society at least as morally depraved as 'Kakanien' but perhaps with greater resources of unconsumed vitality than the latter. Tolstoy's mature life was a relentless fight to free himself from the nets of bigotry and conventionality. He lured, moreover, a number of men and women all over the world to try to 'return' to a pure and simple life in truth. He was himself tragically incapable of this return; the last effort he made was a suicide of its kind. Also Wittgenstein's withdrawal to be a schoolmaster for peasant children was a failure. I think that both Wittgenstein and the great Russian were partly victims of an illusion about the actual existence of a country 'Erehwon' uncontaminated by the moral ills of the society we live in and where we can go to start a new life. Tolstoy went to Caucasus and to the Bashkirs in search of it. Wittgenstein sought it in remote villages in lower Austria, in the wilderness of the fjords of Norway or on the shore of the Ocean in Galway. His abortive plans of settling in the Soviet Union is also a chapter in this story. But the land he sought is really the land 'Nowhere'.

7

In a social atmosphere of bigotry and insincerity language also tends to become corrupted. It is infiltrated by euphemisms. Things

[18] Told and retold by Russell in many places. See, for example, Russell 1968, p. 99.

are no longer called by their blunt and simple names, but are wrapped up in evasive circumscriptions or referred to by invented technical terminology. Style becomes unperspicuous, meaning unclear. In modern society this distortion of language has assumed grotesque proportions in the jargon of public administration and the media. Austria under the late Habsburgs may have been the place where this 'illness of the times', now universal, first flared up. To fight it was the set task of that generation of Austrian 'purifiers' of which Wittgenstein was a member.

Fritz Mauthner's *Sprachkritik* was an early sample of this reaction to language. The fact that Wittgenstein in the *Tractatus* said (4.0031) that all philosophy is critique of language, though *not* in Mauthner's sense, has, I am afraid, long distracted modern philosophers from paying due attention to Mauthner's work. It belongs in the same tradition of which—not counting Wittgenstein—Karl Kraus is the supreme and most influential example.

Wittgenstein admired the work of Kraus. He counted Kraus and Loos among those who had influenced him. It is an interesting but perhaps unanswerable question, whether the Krausian moral attitude to language, which Wittgenstein shared, was perhaps a force which made him broaden his philosophy of logic of the early Cambridge years to the philosophy of language embodied in the *Tractatus*.

It is sometimes held that Wittgenstein's concerns in the *Tractatus* were the conditions which a logically ideal or perfect language has to fulfil. Thus, for example, Russell in his Introduction. This has also been disputed. I think those who dispute it are right, *if* the ideal language was to be a perfection of the *Begriffsschrift* first propounded by Frege and then further developed by the authors of *Principia Mathematica*. Wittgenstein's contribution to *their* project was in the first place the tabular theory of truth-functions and the notion of tautology. But although logic no doubt was the gate through which Wittgenstein entered philosophy, his work in the tradition of Frege and Russell was of short duration. It ended, I would say, when in the early part of the 1914–1918 war the thought of the proposition as a picture first dawned upon him and he wrote in his notebook in January 1915 'My *whole* task consists in explaining the nature of the proposition'.[19] This had not been the 'whole task' of Frege or of Russell.

Rather than saying that Wittgenstein in the *Tractatus* was concerned with the conditions of an ideal language we should, I think,

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[19] Wittgenstein 1979, p. 39: 'Meine *ganze* Aufgabe besteht darin, das Wesen des Satzes zu erklären.'

say that he was in search of *pure* language or of language in its pure and uncorrupted form. The language which would depict the world as it really is, absolutely 'true to fact'. It was to this end that, at a later stage of his work on the book, he conceived of the ontology of immutable and indestructible things to which there correspond names the configurations of which in language picture the contingent configurations of things in reality. There are some indications in the notebooks that Wittgenstein's position was initially wavering on the question whether such a language could actually be found, examples given of things and corresponding names. But in the end he realized that the form and content of the 'pure' language is ineffable. The language of which he was in search is, to use Max Black's happy phrase, a 'never-never language'.[20] It is as remote from the language we speak as is the nowhere land of pure and simple life from the contaminated societies in which we are destined to live.

Because of the way in which the pure language of the *Tractatus* is supposed to reach up to reality, one can also say that the world it is supposed to picture is a 'never-never-world', a postulated ideal which is nowhere to be found. It has occurred to me that the traits of relativism and opposition to realism which some interpreters see in Wittgenstein's later work have their root in the *impasse* of the *Tractatus* approach to language. Just as there is no 'pure' language there is also no 'pure' reality for language to depict.

8

17th and 18th century philosophers had entertained the fiction of 'man in a state of nature'. This fiction was thought useful in their search for the *raison d'être* of the state and the legitimation of societal institutions. Some fancied it to have been an existing state of affairs in the 'uncorrupted' infancy of prehistorical man. Even if this was an illusion, it does not necessarily ruin the philosophic value of the fiction.

In a somewhat similar sense Wittgenstein may be said to have been in search, throughout his reflective life, of a 'natural state of language'. In the *Tractatus* he thought it was hidden under the disfiguring veils of ordinary speech. It existed somewhere deep under the surface of language as used. But he did not find it there. He came to the conclusion that it was not there to be found either.

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[20] Black 1964, p. 11.

He had been looking for it in the wrong direction. It was not to be attained by diving under a surface but by looking at the surface itself. *There* was to be found the uncorrupted language of which he was in search. The difficulty was only to see it. 'Nothing is hidden.'

It is often said that one of his early ideas which Wittgenstein never gave up is his conception of philosophy. Basically this is true, I think. But it is not a truth without modifications. It holds for his conception of philosophy as an activity and not a doctrine (*Lehre*), and of philosophy as critique of language. But it does not hold for his specific view that philosophical problems are due to linguistic confusions, to what he later called the *bewitchment (Verhexung)* of our thinking by the means of language. There is no statement to this effect in the early writings. There he speaks of the philosophic problems resting on a misunderstanding of the ('true') logic of our language, on a confusion of the *grammatical* with the *logical* form of thought.[21]

The problems which arise through a 'linguistic bewitchment' of our thought are not questions in search of an answer, but 'bumps that the understanding has got by running its head up against the limits of language' (PU 119). A main reason why we get these 'bumps' is 'that we do not *command a clear view* of the use of our words' (PU 122). We miss the *übersichtliche Darstellung* ('perspicuous presentation') which will expose to us the undistorted use of language and 'bring words back from' what Wittgenstein calls 'their metaphysical to their everyday use' (PU 116). The clarity which the perspicuous presentation gives is an absolute. It makes the philosophical problem disappear completely (PU 133). The disquietude is gone and the philosopher attains his aim which is 'Friede in den Gedanken'.[22]

Philosophy which follows these lines is strictly *descriptive*. It does not *explain* anything—for example how it is possible for signs to mean. Nor does it answer questions of essence, for example what thinking, or truth, or logical necessity are. Unlike most philosophy after Kant it is neither transcendentalist nor essentialist.[23] It puts the 'how possible?'—and 'what is?'—questions aside by directing our attention to the rôle which the problematic words play in actual

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[21] See, for example, the *Tractatus*, the Preface (Vorwort) and *ibid.* 4.002, 4.003, and 4.0031.

[22] Wittgenstein 1980, p. 43.

[23] Both attributes, in my opinion, apply to the *Tractatus*. There Wittgenstein is in search of the essence of language (the proposition) and of the transcendental a priori conditions of the possibility of language. (The resemblance with Kant has often been noted.) The later philosophy of Wittgenstein is opposed to both

communication. In this sense 'the work of the philosophers' can be said to consist 'in assembling reminders for a particular purpose' (PU 127).

A philosophy which does not look for answers to questions, does not explain or theorize about the things which attract the philosopher's curiosity, and does not try to provide the foundations for our beliefs, is not a philosophy for which scientific thinking sets the pattern. It, on the contrary, fights the infiltration of this thinking into philosophy and makes it responsible for the confusions from which the philosopher tries to rid himself. It is not, need not be, hostile to science as such. But it may be said to take a critical or even hostile attitude to the influence of science outside its proper domain—and in particular on philosophic thought. In *this* it runs counter to an intellectual mainstream of the century.

9

There are a few points on which one might wish to challenge the consistency of Wittgenstein's (later) view of philosophy. On the one hand Wittgenstein says that the philosopher must 'in no way interfere with the actual use of language' and that philosophy 'leaves everything as it is' (PU 124). But he also says that he is 'engaged in a struggle with language'.[24] In a passage in the unpublished part of the 'Big Typescript' he describes this struggle as follows—I have here translated it into English—:[25]

> Human beings are deeply embedded in philosophical, *i.e.* grammatical confusions. Freeing them from these *presupposes* tearing them away from the enormous number of connecting links that hold them fast. A sort of rearrangement of the whole of their language is needed. ('Man muss sozusagen ihre ganze Sprache umgruppieren.')—But of course that language has developed the way it has because some human beings felt—and still feel—inclined to think that way. So the tearing away will succeed only with those in whose life there already is an instinctive revolt against the language in question and not with those whose instinct is for the very herd which created that language as its proper expression.

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tendencies. There is a profound change in this regard as compared with the *Tractatus*. Some attempts to 'transcendentalize' Wittgenstein's later philosophy of language therefore seem to me substantially mistaken. (Which does not prevent them from having some independent interest in themselves.)

[24] Wittgenstein 1980, p. 11. 'Wir kämpfen mit der Sprache. Wir stehen im Kampf mit der Sprache.'

[25] MS 213, p. 423.

This sounds almost like a cry for a 'cultural revolution' needed for putting the philosophic worries to rest. Because is not the 'Kampf mit der Sprache' also an interference with it? Particularly if it requires a 'rearrangement of the whole of language'? And a similar question can be raised about the attempt to 'bring back' (in German 'zurückführen') the words from their 'metaphysical' to their 'everyday' use.

Wittgenstein's talk about philosophy suggests to me the following picture:

There are in the large garden of language tidy plots of land where uncorrupted language-games are being played by human users. But this garden is also partly overgrown by metaphysical weeds which hide the plots from sight and blur their borders and thereby confuse those who play with language. The good philosopher should be a gardener who by clearing away the weeds displays the plots of linguistic ground in their purity and thereby helps communication to go on unimpeded by the metaphysical-philosophical confusions.

But is this picture not another vision of the pure and uncorrupted language of which Wittgenstein had been in search in the *Tractatus*? He could not find it then because he sought it under the surface of everyday language rather than on the surface itself. But if this surface is partly veiled, hidden, overgrown by metaphysical weed which must be removed before we command a perspicuous view of what things are like, may it then not be the case that this uncorrupted ordinary (use of) language too is a never-never thing and that the search for it must end in frustration? Does belief that this is not so perhaps rest on an illusory idealization of ordinary language?[26]

My impression sometimes is that Wittgenstein in the *Tractatus* had attained a position which, as it stood, was *unassailable*. As we know, he himself assailed it later. He even talked of 'grave errors' in his earlier writing.[27] His thinking took what may be called a 'philosophic *U*-turn': from the surface to the hidden depths, then from the depths back to the surface.[28] But I know from what Wittgenstein told me that there were moments when he doubted whether this was a turn in direction to final clarity or whether it too would

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[26] The phrase 'idealization of ordinary language' was suggested to me in conversation by Heikki Nyman.

[27] Wittgenstein 1953, Vorwort, p. x.

[28] Cf. Wittgenstein 1953, 108: 'Die Betrachtung muss gedreht werden, aber um unser eigentliches Bedürfnis als Angelpunkt.'

end in an impasse of obscurity. This is the radical, 'existential' doubt of one who cannot resolve the question whether all his efforts have been a failure. No outsider can resolve it for him either.

10

The bewitchment of our thinking through language happens when words take on what Wittgenstein calls a 'metaphysical' use. So one can say that Wittgenstein's fight with language was a fight with metaphysics. This was precisely what the logical positivists had been engaged in. 'Überwindung der Metaphysik durch logische Analyse der Sprache' was the title of one of Carnap's articles in *Erkenntnis*. So what difference, if any, was there in their respective attitudes to metaphysics?

For the positivists, questions were 'metaphysical' when they could not be decided by the methods of natural science or by logical deduction from scientifically acceptable premisses. As amply testified in the documents from the heyday of positivism, metaphysics was seen by the champions of the 'new philosophy' as an outgrowth and residue of religious beliefs of a pre-modern society, as a rationalized disguise of at bottom irrational attitudes. Metaphysics was philosophy which had helped reactionary forces in society to block and retard the progress of emancipated, rational, and secularized man.

Wittgenstein's fight against metaphysics was something very different. By a metaphysical use of language Wittgenstein means the 'free-wheeling' of language which occurs when words get detached from their actual use in the language-games of communicative discourse and are being used for constructing what Wittgenstein calls *Luftgebäude* (translated 'houses of cards') in the linguistic isolation of the philosopher's mind.[29] In past centuries of European history the thinking of metaphysicians was to a large extent nourished by the linguistic rituals of a religious culture. This was a culture in which language-games with words like 'God', 'sin', 'grace' and 'doom' and 'redemption' had an established everyday use. In a similar manner, the thinking Wittgenstein calls metaphysical is stamped by the linguistic patterns and thought habits of a predominantly scientific civilization.

The metaphysics which Wittgenstein is fighting is thus not one rooted in theology but one rooted in science. He is fighting the

[29] Wittgenstein 1953, p. 118.

obscuring influence on thinking, not of the relicts of a dead but of the habits of a living culture. Of this he gives clear warning in the *Blue Book* where he wrote:[30]

> Philosophers constantly see the methods of science before their eyes, and are irresistibly tempted to answer questions in the way science does. This tendency is the real source of metaphysics, and leads the philosopher into complete darkness.

He immediately gives examples: The craving for general theories, what he calls 'the contemptuous attitude to the particular case';[31] the tendency to explain the concept of number, to reduce the infinite to the finite, mathematics to logic, intentional behaviour to bodily movement. The most vulgar examples of these tendencies we find, it seems to me, in contemporary philosophy of mind, be it in the form of the physicalists' 'identification' of so-called mental states with brain processes or the eliminative materialists' rejection of our common sense psychological concepts—what they call 'folk-psychology'—as a 'radically false theory' eventually to be replaced by a perfected neuroscience. Farther into the jungle of metaphysics, as Wittgenstein saw it, philosophy can hardly lose itself than in these latter day phenomena of a philosophic culture gone 'scientist'.

Thus one can say—I am here quoting Stephen Hilmy's book on the later Wittgenstein—that Wittgenstein's 'conception of metaphysics was such that it encompassed not only traditional metaphysics, but also, and especially, the dominant mode of reflection of our own epoch; and it is primarily the latter,—that constituted the intellectual current against which he was struggling'.[32]

It is ironic that the metaphysics which Wittgenstein was fighting was exactly the one in the cobwebs of which the logical positivists and a good many of their followers among analytical philosophers according to him had been caught.

It is worth asking here how Wittgenstein himself viewed the great efforts of past thinkers who had tried to encompass the world intellectually in systems we call 'metaphysical'. The thing to say in response to the question is that he had no need to combat these systems and that he therefore also was, or would have been, able to bestow on them the respect and awe (*Erfurcht*) which he was disposed to feel towards *great* achievement in all spheres of human life. But he was also acutely aware that he was not *continuing* a

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[30] Wittgenstein 1958, p. 18.
[31] Ibid., p. 18.
[32] Hilmy 1987, p. 225.

tradition. What he did was as different from what a Leibniz or a Spinoza had been doing as is life in our times different from what it was in theirs. Yet there is also enough resemblance to make *his* philosophy, as he said himself, 'a legitimate heir' to those intellectual pursuits of the past which traditionally go under the name 'philosophy'.[33]

I hope to have made it clear in which sense Wittgenstein's efforts in philosophy were a fight against a dominant climate of opinion in our century. I have called this climate that of Modernity. It was in origin coupled with a euphoric belief in progress thanks to the managerial uses of reason in industrialized democratic societies. This optimism has largely faded in the woes of two global wars and under the load which man has imposed on nature, threatening the biosphere with breakdown. But also amidst the sombre or even apocalyptic mood of scared humanity, this rake's progress continues. 'Science and industry—', Wittgenstein wrote a few years before he died, 'might turn out to be the most enduring thing in the modern world'.[34] But he also wrote that there is nothing absurd in the belief 'that the age of science and technology is the beginning of the end of humanity' and that mankind in seeking to steer its course towards the future relying on scientific rationality 'is falling into a trap'.[35]

Wittgenstein's philosophy and also his life was a protest against these trends and an effort to set an example of 'a changed mode of thought and life' which, if followed might provide a cure for what he thought of as a sick time. But no rule can, I think, be laid down for how to imitate his path.

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[33] Wittgenstein 1958, p. 62. The fullest statement by Wittgenstein himself of his views of philosophy is the chapter 'Philosophie' in TS 213 (the 'Big Typescript'). This chapter has now been published. (Wittgenstein 1989.)—Of great interest are the pronouncements made by Wittgenstein on his philosophy recounted by G.E. Moore in Moore 1954–1955 (particularly the third article). In the early 1930's Wittgenstein too, *somewhat* in the style of the Vienna positivists, seems to have thought of his way of doing philosophy as a great break with tradition. Moore III, p. 26: 'He said that what he was doing was a "new subject", and not merely a stage in a "continuous development"; that there was now, in philosophy, a "kink" in the "development of human thought", comparable to that which occurred when Galileo and his contemporaries invented dynamics; that a "new method" had been discovered, as had happened when "chemistry was developed out of alchemy". It is perhaps significant that statements with this colouring are not found in Wittgenstein's own written work.

[34] Wittgenstein 1980, p. 63.

[35] Ibid., p. 56. 'Es ist z.B. nicht unsinnig, zu glauben, dass das wissenschaftliche und technische Zeitalter der Anfang vom Ende der Menschheit ist; dass die Idee vom grossen Fortschritt eine Verblendung ist, wie auch von der endlichen Erkenntnis der Wahrheit; dass an der wissenschaftlichen Erkenntnis nichts Gutes oder Wünschenswertes ist und dass die Menschheit, die nach ihr strebt, in eine Falle läuft. Es ist durchaus nicht klar, dass dies nicht so ist.'

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VI

A PILGRIM'S PROGRESS

1

It was not easy for me to think of a way of responding adequately to the kind invitation of the Editor of *Philosophers on Their Own Work* to contribute 'a realistic self-critical personal essay which should enable the reader to grasp your thoughts as a whole'. I am afraid that my contributions to philosophy do not form much of a unity, either as far as the development of my thinking or as far as my choice of research topics are concerned. I have reflected a good deal on the question what I, as a philosopher, am doing—about the aim and nature of philosophy, so to say. Perhaps the rambling character of my philosophic itinerary was one reason why I was never able to answer the question to my own satisfaction.

The best I can do here is therefore to try a brief account of *one* of my journeys through the philosophical landscape. It has lasted for nigh on thirty years, but I now think of it as essentially terminated. The topic I have in mind is 'deontic logic'.

2

I had my first training in philosophy in Helsinki in the mid-1930's under the guidance of a brilliant and impressive teacher, Eino Kaila. It was in the heyday of logical positivism and Kaila, who had himself taken part in the meetings of the *Wiener Kreis*, imported the 'new' philosophy to Finland thereby effecting a great change in the philosophic culture of the country. Its most lasting effect was a strong interest in logic which has prevailed now through four academic generations.

One of the opinions which I implicitly imbued as a student and never questioned was that there is a deep conceptual gulf separating the world of facts from that of norms and values, the *Sein* from the *Sollen*. This view was not only part of the 'positivist' legacy. It was also characteristic of an intellectual *Zeitgeist* which had found

manifestation in Hans Kelsen's 'pure theory' of law and Max Weber's gospel of a 'value-free science'. In Finland, Edvard Westermarck's ethical relativism and subjectivism loomed heavily over the spiritual landscape. He was one of the intellectual glories of the country and one was brought up to admire him. (Incidentally, I never met Westermarck.)

A radicalization of the view separating Is from Ought was the opinion that norms—and maybe value-judgments too—are neither true nor false. Normative discourse was considered 'a-theoretical', void of 'cognitive meaning'. This view had, already before the advent of logical positivism, been advocated with great acumen by the Swede Axel Hägerström and was, under the somewhat misleading name of 'value-nihilism' flourishing in Scandinavia in the years of my philosophic apprenticeship.

If norms lack truth-value, how could logical relations, such as e.g. contradiction and logical consequence, subsist between norms? Hägerström straightforwardly denied the possibility. The logical positivists, on the whole, inclined to the same opinion. But in their camp some groping efforts were also made to create a 'logic of imperatives'. The positivists were keen on logic—and *perhaps* logic need not be confined within the boundaries of the true and the false.

3

In those early years I did not take much interest in the philosophy of norms and values. My first research topics were induction and probability and they kept me busy, roughly, from 1938 to 1948. Then I turned to 'deductive logic'. Very soon I made an accidental discovery, viz. that the modal notions of necessity, possibility, etc. exhibited a striking formal analogy with the quantifiers 'all', 'some', etc. This led me to study modal logic, then still a rather neglected subject. I had hardly embarked on it when I was struck by an analogy between the modal notions and the normative notions of obligation, permission, etc. It happened in the course of a conversation about moral matters with some friends at Cambridge. It was easy to work the observation into a 'system'. I hurried to write a paper and sent it to *Mind* where it appeared shortly after receipt. This was in 1951 and the paper was called 'Deontic Logic'. The name was a suggestion of my senior friend C.D. Broad.

I did not realize at first that I had been acting as midwife of a new discipline. (Later I got to know that others too had been engaged in a similar enterprise, but I think it is right to say that my

share in the work had been decisive.) In the mid-1950's deontic logic became established, and has since been cultivated by philosophers, logicians, and philosophically minded jurists the world over. A bibliography of the subject compiled by Amedeo G. Conte and Giuliano Di Bernardo in 1977 lists 1460 contributions.[1] Since then developments have continued—as far as I can judge—with accelerated speed.

4

At the beginning I thought, naively, that deontic logic was a logic of norms. It did not occur to me that this might be in conflict with the view, which I have always continued to hold, that norms lack truth-value. A few years later when I republished my *Mind*-paper in *Logical Studies* (1957) I wrote in the Preface to the book that the possibility of a logic of norms simply showed that the province of logic transcends the borders of the true and the false; an opinion which is, I think, shared by a good many logicians and philosophers today.

I was never able comfortably to acquiesce to this view, however.—Some of the classics of a philosophy of norms, like Hägerström and Kelsen, had already noted that deontic (normative) sentences exhibit an interesting ambiguity. One and the same form of words may be used both for giving a norm *and* for stating, truly or falsely, that a norm has been given, e.g. belongs to a certain legal order. In the first case language is used *prescriptively*, in the second *descriptively*. Prescriptions, unlike descriptions, have no truth-value. This ambiguity of deontic sentences had, moreover, been exploited systematically by a Swedish philosopher of a younger generation, Ingemar Hedenius. He spoke of 'genuine' and 'spurious' legal sentences, the first being prescriptive and the second descriptive.

It then occurred to me that perhaps deontic logic was really a logic of normative sentences in their descriptive interpretation, expressing what I also called *norm-propositions*. This was the view I took in *Norm and Action* (1963)—and continued to entertain for a long time afterwards. In the end, some twenty years later, I came to reject this view, too. Does this mean that we have to throw overboard deontic logic as an empty game with logical symbols which cannot be given a meaningful interpretation? Fortunately, it does *not*

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[1] *Logica deontica e semantica*, a cura di Giuliano Di Bernardo, Mulino, Bologna 1977.

mean this. But before commenting on my present position I shall say a few words about things which took place in the meantime.

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We must introduce here a little bit of symbolism *OA* and *PA*, for '*A* is obligatory' and '*A* is permitted', respectively. What are the 'things' which norms pronounce obligatory or permitted? I had already raised the question in my 1951 paper and answered thus: these things are (human) actions. I was not then aware of the distinction, familiar in German philosophic literature under the names *Seinsollen* and *Tunsollen*, between that which ought to *be* and that which ought to be *done*. The answer which I had given to the above question indicated that I conceived of deontic logic primarily as a logic of the *Tunsollen* (*-Dürfen*). I then took it for granted that symbols for actions could be handled with the same symbolic tools as those traditionally used for handling sentences (propositions). This, however, was a questionable assumption and constituted a challenge for me to scrutinize in further detail the logical structure of actions and action discourse.

Actions normally manifest themselves in the production, sometimes also in the prevention, of changes 'in the world'. A study of the structure of action inevitably led to a study of change. Thus I arrived at the vision of a hitherto unexplored hierarchy of 'logics': a Logic of Norms ('deontic logic') based on a Logic of Action based on a Logic of Change. Action and change are *dynamic* categories and may as such be contrasted with the *static* categories of state, thing, property, and relation of traditional logic.

The departure from orthodoxy signalized by deontic logic was perhaps not as radical as I saw it then, at the time when I wrote *Norm and Action*. But it still seems to me that a further development of deontic logic cannot ignore the study of its 'sub-structure' in action discourse. This sub-structure is now better explored than it was twenty years ago—but still, I should say, undeservedly neglected. I hope, and believe, that it will not long remain so.

As far as the bottom stratum of the hierarchy was concerned, a logic of change, it soon turned out that it already existed in the more developed form of a 'tense-logic' or temporal logic. The pioneer in that field had been Arthur Prior (1915–1968). He, in his turn had been inspired partly by my work in modal logic.[2] Later I

[2] A.N. Prior, *Past, Present and Future*, Clarendon Press, Oxford 1967, p. 20.

joined work in tense-logic also independently of my interest in deontic logic. It has led me[3] to reflect on the logical scaffolding of a dynamic world which is implicit in Hegelian or Dialectical Logic. But this is another itinerary of mine, still in progress, and I shall not attempt to describe it here.

6

My efforts to build a logic of norms had thus taken me, first to a logical study of action and, eventually, to that of change and time. But this did not mean that I was, after *Norm and Action*, finished with deontic logic. In the first instance there were some problems of a formal logical rather than a 'philosophical' nature which continued to puzzle me.

One problem concerned permissions. Permissions are usually related to choice. If an agent has been permitted to do something he is usually not compelled to do this thing but may either do or abstain as he chooses. In particular, if he is allowed to do either one of two things, it is normally understood that he may do the one but also may do the other. A 'disjunctive permission' $P(A \vee B)$ is thus normally 'conjunctively distributable' into PA and PB. ('v' is the symbol for 'or'.) A permission of this kind I have called Free Choice Permission.[4] The 'formalization' in deontic logic of this notion is connected with difficulties to which I know no entirely satisfying solution. The problem cuts deep into the logic and philosophy of norms because it concerns the relation between permission and *freedom of choice*.

Another problem which is also awaiting an accepted solution concerns *conditional* (hypothetical) norms. This problem gets part of its urgency from the fact that conditional norms are of utmost importance in legal contexts. Legal obligations usually arise under certain conditions. This is also true of many moral obligations. An example is promise-giving. One is seldom obligated, *simpliciter*, to give a promise; but *if* one has given one, one ought to keep it.

What is the correct expression for a conditional norm, i.e. what is the expression in language which correctly reflects the logical form here? One proposal is: 'If p, then Oq', i.e. 'If it is the case that p it ought to be the case that q'. In symbols: $p \rightarrow Oq$. Another proposal

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[3] Beginning with my Eddington Memorial Lecture, *Time, Change, and Contradiction*, Cambridge University Press 1969.

[4] The term was coined in *An Essay in Deontic Logic and the General Theory of Action* (1968) and has since become current.

runs: ' It ought to be the case that if p then q' or, in symbols, $O(p \rightarrow q)$.

The first proposal makes the obligation conditional upon the truth of a proposition. But this sort of 'hybrid' between a proposition which is true or false and a norm which lacks truth-value is a logical monster—at least under any normal interpretation of the 'if-then' relation. Things would be in order if one interpreted 'Oq' descriptively, as expressing the norm-proposition that it ought to be the case that q. But then $p \rightarrow Oq$ does not express a norm but says that under a certain condition (p) a norm to such and such effect (Oq) exists. *This* norm is not, however, conditional but categorical.

The second proposal, $O(p \rightarrow q)$, again encounters two grave difficulties.—If it is the case that p and if the conditional norm makes it obligatory that, if p then q, then, surely, it (now) ought to be the case that q. The conjunction of the condition and the conditional obligation, in other words, seems to justify the 'detachment' of the unconditional obligation to perform the conditioned action. I ought not to promise, but *if* I have given a promise I (then) ought also unconditionally to keep my word. But no respectable logic could allow an inference from p and $O(p \rightarrow q)$ to Oq. (This is one reason why some people think that the form of a conditional norm must, after all, be $p \rightarrow Oq$ which would allow the detachment, and not $O(p \rightarrow q)$.)

The second difficulty is caused by the provability, in any standard system of deontic logic, of the formula $O{\sim}p \rightarrow O(p \rightarrow q)$. This seems to say that from a norm to the effect that it ought *not* to be the case that p it 'follows logically' that there is also a norm to the effect that it ought to be the case that *if*—in spite of the obligation to the contrary—it *is* the case that p then it is also the case that q, where 'q' can stand for just anything which may be or not be.

This second puzzle is but a variant of a famous 'paradox' of deontic logic which was first pointed out by the eminent Danish jurist-philosopher Alf Ross. The paradox is as follows:

In standard deontic logic the formula $Op \rightarrow O(p \vee q)$ is provable. This seems to allow the following argument: If it ought to be that a letter is mailed, then it ought also to be that it is mailed or burnt. (This is a paraphrase of Ross's famous example.)

Ross's Paradox has inspired hundreds of papers—and the number continues to grow. Some would perhaps say that it has been discussed *ad nauseam*, or that the paradox is 'innocuous', or that there *is* no 'paradox' at all. This may be true. But it is also true that Ross's observations cut *deep* into the philosophy and logic of norms. The matter, I should say, is much more interesting than the much

discussed Paradoxes of Implication in propositional and modal logic. What makes Ross's Paradox interesting is that it challenges the very *possibility* of logical relations between norms—and therewith the possibility of a (genuine) 'logic of norms' which deontic logic in origin was intended to be.

Hägerström had denied this possibility. Ross was a follower of his. It was in the spirit of his master that Ross came up with his Paradox. He modified his opinions later but never fully reconciled himself to the existence of a 'deontic logic'. Kelsen, after having prided himself that his *reine Rechtslehre* was the foundation of a *Logik des Sollens*, came in his old age[5] to entertain the same drastic view as Hägerström; he called his final position *Normenirrationalismus*. And now I too, after a long and winding itinerary have come to the same view: logical relations, e.g. of contradiction and entailment, cannot exist between (genuine) norms.

7

But—as already indicated (above p. 105f.)—these findings should not induce us to throw deontic logic overboard. What is needed, however, is a re-interpretation and deepened understanding of the nature and significance of this new branch of logic.

So what then *is* deontic logic? I shall try to answer the question as clearly as I can within the brief space here at my disposal.

A normative code *envisages*, I shall say, an *ideal* state of affairs. This ideal state obtains (in the 'real' world) when everything which the norms of the code pronounce obligatory always—i.e. as long as the code continues to be 'in force'—is the case, everything which they prohibit never is the case, and those things which it permits can be the case without obligations being neglected or prohibitions violated. If this ideal state is not *logically possible* then there is something 'wrong' or 'rotten' with the normative code itself. It either imposes demands which *cannot* be all of them satisfied or it permits things which *cannot* consistently with these demands be realized. 'Logic' cannot exclude such demands from being made and licences from being given (for example, by a legislator); but giving them intentionally would surely be irrational, contrary to reason, purposeless. It would be purposeless, since it would make it impossible for the real world to approximate to the ideal—and this approximation is surely what norms urge people to attempt. If that

[5] In his posthumously published *Allgemeine Theorie der Normen*, Hrsg. K. Ringhofer u. R. Walter, Manz Verlag, Wien 1979.

to which norms urge us is, *for reasons of logic*, unattainable, the law-giver is certainly well advised, 'in the name of rationality', to amend the norms—for example by derogating some or modifying others.

For example: Let there be two norms, one to the effect that it ought to be the case that p and another to the effect that it ought to be the case that not-p. If they both belonged to the same code, the 'ideal' envisaged in this code would be a logical impossibility, since it *cannot* be the case both that p and that not p. The contents of the norms contradict each other logically—and therefore it would be irrational, contrary to reason, to require that both norms be obeyed. I shall say that the two norms are *normatively* inconsistent, if their contents, what they enjoin, are *logically* inconsistent.

Next we introduce the auxiliary concept of a 'negation-norm' (of a given norm). The negation-norm of an obligation is a permission with the opposite content. Thus, e.g., $P{\sim}p$ is the negation-norm of Op. The negation-norm of a permissive norm again is an obligation to the contrary. Thus, e.g., $O{\sim}p$ is the negation of Pp.

If a proposition logically entails another proposition, then the first is logically inconsistent with the negation of the second. In analogy with this one could say that a norm 'normatively entails' another, if the first is normatively inconsistent with the negation-norm of the second.

The negation-norm of the norm which enjoins the mailing *or* burning of a letter is a permission to leave the letter unmailed *and* unburnt. This is normatively inconsistent with an order to mail the letter. A person cannot order a letter to be mailed and also permit it to be left unmailed if he behaves 'rationally'. *In this sense* an order to mail a letter can be said normatively to entail an order to mail or burn it. But this does not mean that, if an order to mail a letter has been given, one could 'deduce' from this an order to mail or to burn it. The second order *can* be there (exist); but whether it is or not depends upon whether it (too) has been given.

The appearance of paradox with the formula $Op{\rightarrow}O(pvq)$ is thus due to a mistaken interpretation of this formula as expressing a relation of logical consequence. It does not mean that a norm logically 'entails' another, since logical relations of entailment cannot exist between norms. Nor does it mean that from the existence of a norm can the existence of another norm be logically inferred. What the formula says is simply that a 'law-giver' who ordains something cannot consistently with this permit the opposite of that thing (together with something third), if he wants his legislation to be *rational*.

Deontic logic, one could also say, is neither a logic of norms nor a logic of norm-propositions but a study of conditions which must be satisfied in rational norm-giving activity. It is strict *logic* because the conditions which it lays down are derived from *logical* relations between states in the ideal worlds which normative codes envisage. These relations are not trivial—for one thing because their proper expression and study presupposes a logical analysis, hitherto only insufficiently accomplished, of action discourse and of temporal change. For this and other reasons, deontic logic must, in my opinion, be deemed a fertile and interesting new province of logic.

8

Has deontic logic also wider interest and value besides being interesting *qua* logic? I think it would be difficult to deny that it has—although I should myself like to be the last person to *exaggerate* the importance of deontic logic.

It is a fact that this logic has found extensive applications to the analysis of legal and, to a lesser extent, also moral concepts and discourse. Opinions on the value of deontic logic vary among philosophers of law and morals—some estimate it very highly, whereas others take a guarded or maybe even hostile attitude to it. And, as we have seen, some eminent legal philosophers even dispute the very possibility of a 'logic of norms'. But the liveliness of the dispute which it has engendered already testifies to the intrinsic interest of the subject matter.

9

In the mid-century years and before, there was a tendency to regard exact science as the paradigm of human rationality and as the subject matter most worthy of philosophic reflexion. The tendency was by no means confined to logical positivism although it is true that the positivists were its most forceful and influential spokesmen. It was reinforced also by the impact of some revolutionary changes in the scientific world view connected above all with the origin of relativity theory and quantum physics and with the 'foundation crisis' in mathematics. This last, in turn, was intimately connected with the revolution which was taking place in logic after Frege.

Parallel with the eulogy to 'scientific rationalism' in philosophy there was a tendency to relegate norms and values to a 'sub-rational'

sphere of emotion and subjectivity. This tendency, too, found a forceful articulation through logical positivism, but it had certainly also been nourished, partly by 'irrationalist' trends in late 19th and early 20th century philosophy, and partly by the 'cultural relativism' encouraged by the findings of social anthropology and comparative study of religion.

It was in the atmosphere of these tendencies and trends that my own upbringing and intellectual training took place. (Cf. above.)

This atmosphere no longer prevails. I suppose that one reason for the change is the fact that the aspects of reality which were relegated to the 'sub-rational' underground have given rise to problems which threaten the very basis of civilization and even the future of the human species. With these threats those aspects have also acquired a new dignity as objects of philosophic thinking.

I think that deontic logic and the interest it has aroused in wider circles than those of logicians partly reflects but also, in a modest way, has contributed to what might be termed 'a rehabilitation of practical philosophy'[6], i.e. to a renewed and deepened interest in norms and values and the various forms of human action and creativity. One no longer turns away from these matters as representing inferior forms of rationality—nor does one dismiss, as the logical positivists tended to do, discourse about them as 'a-theoretical' or even 'meaningless'. This I would consider a hopeful development in a world which, like ours today, is exposed to destructive threats from forces which are antagonistic to the use of reason—the faculty which distinguishes man from the rest of the animal kingdom.

Postscript

(1992)

At the time when I wrote the above semi-autobiographical account I thought I had finished with deontic logic for good. Of the position which I had then reached, after so many changes of my views, I had given a full account in a paper called 'Norms, Truth, and Logic' published in the first volume of my *Philosophical Papers* (Basil Blackwell, Oxford 1983). *Basically*, my views have not changed

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[6] I have borrowed the phrase from the title of a work which is significant of the new trend: *Rehabilitierung der praktischen Philosophie* I–II, Hrsg. M. Riedel, Verlag Rombach, Freiburg 1972/1974.

since then. But they have undergone several 'supplementary developments'. I should now say, for example, that the 'oblique' conditions of contradiction and entailment which have to be observed in rational norm-giving activity constitute genuine standards of *logical* correctness. Thus I have, after a detour which lasted some forty-odd years, come back full circle to the view which I expressed in the Preface to Logical Studies (see above p. 105) that Logic has a wider reach than Truth. But I think the journey was worth making.

VII

A PHILOSOPHICAL LOGICIAN'S ITINERARY

I

My early logical preoccupations were in inductive logic. One of their main topics was the concept of probability. Roughly speaking, this period in my working life ended in 1951 when my book *A Treatise on Induction and Probability* was published. But from time to time I have later returned to these areas of research.

The core of traditional inductive logic are the well known 'canons of induction', invented by Francis Bacon and first systematized by John Stuart Mill. They are methods for ascertaining the causes of given effects, and the effects of given causes. In my treatment, the notions of cause and effect were replaced by the more precise ideas of necessary and sufficient conditions. This made it possible to restate and re-evaluate, in the exact terms of a logic of conditions, the classical canons or methods of induction of Bacon and Mill.

Another, more recent, branch of inductive logic is known as confirmation theory. It studies, roughly speaking, the way in which the accumulation of evidence affects the probability of generalizations from experience and other kinds of inductive hypotheses.

If I had to characterize briefly my own achievement in the field of inductive logic I would do it as follows: I have tried to show how the probabilifying effect of evidence on a given hypothesis is an isomorphic reflection in numerical terms of a process of eliminating members from a class of hypotheses initially competing with the given one. This eliminative procedure is the logical core of Mill's canons. My aim can thus be said to have been a unification of the two main branches of inductive logic: induction by elimination in the tradition of Bacon and Mill, and induction by confirmation in the tradition founded by the Cambridge logicians J.M. Keynes, C.D. Broad, and W.E. Johnson and later continued by Carnap and others.

An interesting side-issue in this search for a unified theory is constituted by the so-called Paradoxes of Confirmation. I have

dealt with it also in later publications. My final statement on this issue is a paper published in 1966.[1]

2

From inductive I then turned to deductive logic. It happened during those years after the war when I was, first a visitor, and later a professor at Cambridge. I set myself the aim to show that Wittgenstein's idea in the *Tractatus*, according to which truth in logic is tautological, could be extended beyond the propositional calculus to the calculus of properties and relations. Connected with this goal was an idea that truth-tables might be used also in those extended branches of logic for testing the logical truth (tautologicity) of formulas.

The program started promisingly with my showing that it could be carried through for quantification in the realm of one-place predicates.[2] (In fact, Quine had showed the same a little earlier but I did not know of his work until later.)

I pursued my work into quantification theory for relations, and eventually solved the problem for formulas containing not more than two overlapping quantifiers.[3] But for triple quantification the problem was beyond my ability—and attacking it would actually had led to an impasse.

However, a lasting fruit of all these efforts (also in blind alleys) was the discovery of what is known as distributive normal forms of formulas of the first order functional calculus. I also had the good fortune of having a pupil, Jaakko Hintikka, who took research on these normal forms much farther than I had done. In a certain sense Hintikka's achievement may be said to vindicate my intuitions concerning the importance of the notion of tautology for clarifying the notion of truth in logic.[4]

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[1] 'The Paradoxes of Confirmation'. In *Aspects of Inductive Logic*, ed. by Jaakko Hintikka and Patrick Suppes. North-Holland Publishing Co., Amsterdam 1966.

[2] 'On the Idea of Logical Truth. I.' *Societas Scientiarum Fennica. Commentationes Physico-Mathematicae*. Vol. 14, no. 4.

[3] 'On Double Quantification.' *Ibid.* Vol. 16, no. 3.

[4] Cf. Jaakko Hintikka, 'von Wright on Logical Truth and Distributive Normal Forms'. In *The Philosophy of Georg Henrik von Wright*. The Library of Living Philosophers. Vol. XIX. Ed. by P.A. Schilpp and L.E. Hahn. Open Court, La Salle, Ill., 1989.

3

One day during the time when I was living at Cambridge and walking along the bank of the river Cam I was struck by the following thought:

Let (the letter) A stand for a property, e.g. redness. And let $E\,A$ denote that there is, exists, something with this property, e.g. something which is red. $\sim E\,A$ then means that there is no thing with this property or that nothing is A. $\sim E \sim A$ again means that no thing is not A or, in other words, that everything is A. For the complex symbol $\sim E \sim$ one could also have a symbol (abbreviation) U.

Now compare with the following: Let (the letter) p represent a (sentence which expresses a) proposition, e.g. the proposition that it is raining. And let $M\,p$ denote that it is possible that p. $\sim M\,p$ then means that it is not possible, i.e. that it is impossible that p. $\sim M \sim p$, finally, means that it is not possible that not p or, in other words, that it is necessary that p. For the complex $\sim M \sim$ we could also introduce a simple symbol, say N.

What these simple observations amounted to was that the modal notions of possibility, impossibility, and necessity exhibited the same pattern of interdefinability as the quantifiers 'some(thing)', 'no(thing)', 'every(thing)'. Of these latter concepts, the quantifiers, there has existed, at least since the time of Frege, a well developed formal theory. This theory, in fact, may be said to constitute the very core of classical logic. Of the former notions, the modalities, there also existed a logic. Modal logic had been extensively studied by Aristotle and the mediaeval scholastics. But it had laid more or less dormant for several hundred years and remained practically untouched by modern developments after Frege. True, there was the work of C.I. Lewis and Jan Lukasiewicz. But these logicians had thought of modal logic as a kind of 'non-classical' alternative to the 'classical' tradition which had been revived in the work of Frege and Russell. This, in my opinion, is an unfortunate idea. What my observation seemed to indicate was that modal logic could be developed, not as an *alternative*, but as a *parallel* branch to the logic of the quantificational notions. Moreover, the analogy in basic patterns between quantifiers and modalities made it possible to use methods and techniques, known from the study of the former notions, also for the study of the latter.

My enthusiasm about these discoveries was so great that I,—in a couple of months and in almost total ignorance of the work of others already in progress in a similar direction—wrote a small

book on the subject. It was called *An Essay in Modal Logic* and appeared in the then newly started series 'Studies in Logic and the Foundations of Mathematics' to which I had been invited to contribute. It was published in the same year (1951) as my treatise on induction and probability.

Since then modal logic has come back and grown into one of the most intensely cultivated branches of contemporary logical study. It is still in some quarters regarded with suspicion, and the unfortunate label 'non-classical' is often attached to it. A forceful critic of modal logic has been Quine. I think, however, that the kind of conservatism in logic which he represents will gradually fade away. The modal notions are admittedly loaded with heavy problems of a philosophical nature and will continue to cause controversy. But the same also holds true, I would say, of the quantifiers and some other more 'established' concepts in the science of logic.

4

The analogy with the quantifiers as regards patterns of interdefinability and distributive properties can be extended from the strictly modal notions to a whole family of related concepts. To this family belong various epistemic and doxastic ideas such as those of knowledge and belief, certainty and doubt, verification, etc. Their logical study is known as *epistemic logic*. The rudiments of the analogical relationships were described in my *Essay*. But their more detailed and profound study has been the work of other logicians. A classic in this new branch is Hintikka's book *Knowledge and Belief*. It was published in 1960. Another Finnish logician who has done excellent work in this and other branches of extended modal logic is Hintikka's pupil Risto Hilpinen.

Another off-shoot on the same ancestral tree of logical study is *deontic logic*. It was born in the very same year as my *Essay* was published.

Let A be a symbol for a (type or category of) action, e.g. the action of smoking. And let $P\,A$ denote that this action is permitted. $\sim P\,A$ then means that the action in question is not permitted. And if not permitted, presumably forbidden. $\sim P \sim A$ would then mean that it is forbidden not to do the action in question or, in other words, that one ought to do it, that the action is obligatory. For obligatoriness we can also introduce a simple symbol O as an abbreviation of the complex $\sim P \sim$.

These observations turned out to be more controversial that I first realized. Is it right to identify the not-permitted character of an

action with its being forbidden? Is prohibition the same as the absence of permission—and conversely permission the same as absence of prohibition? These are in fact questions of long standing in the philosophy of law. At the time when I invented deontic logic I was blissfully ignorant of them.

My work in logic after the *Essay* has to a great extent, though far from exclusively, been in this new field of deontic logic or the logic of norms, as it is also called. I have not been alone: A bibliography published in 1977[5] already listed nearly fifteen hundred books and articles, and it would not surprise me if the number had since then at least doubled.

A main reason for my continued interest in deontic logic has been that the subject, in spite of the fact that it is by now an established branch of logical study, remains problematic not to say controversial from a philosophical point of view. Since genuine norms are neither true nor false, how can there exist logical relations such as, for example, contradiction and entailment between norms? Deontic logic seems to signalize an extension of traditional logic beyond the confines of truth and falsehood. It therefore constitutes a challenge to the very notion of logical reasoning.

However, deontic logic has not only been for me a source of philosophical concerns. It has also opened up vistas in yet other, so far unexplored, directions.

5

Norms deal with human action. But what is an action? Roughly speaking, an action is the production, intentionally by some agent, of a change in the world. But what is change? For purposes of a first approximation one could say that a change is a transition of one state of affairs to its contradictory (opposite).

Let p represent a state of affairs. $pT{\sim}p$ shall then symbolize its transformation, change, to the opposite state. If this change is brought about by action it is also called the *destruction* of the state in question. The reverse change, ${\sim}pTp$, if brought about by action, is called the *production* of p. An example could be the closing and the opening respectively of a window.

Not all action, however, is either productive or destructive. An agent may prevent a state from vanishing, but also from coming to be. In the first case he is said to conserve or *sustain* the state in

[5] See the essay 'A Pilgrim's Progress', above, p. 105.

question, in the second case to *suppress* it. The symbols for these two not-changes would be pTp and $\sim pT\sim p$.

Production and destruction, sustaining and suppressing I shall call the four basic or elementary modes of human action. One can construct a formal theory, an 'algebra' or a 'logic', for these four modes and for the complex modes which are definable in terms of them. This theory may be called a Logic of Action. It, in turn, is based on a Logic of Change or of state-transformations which is essentially a logical theory for the above symbol T.

We thus get a picture of a hierarchy: a Logic of Norms (Deontic Logic) based on a Logic of Action which is based on a Logic of Change. In my book *Norm and Action* which appeared in 1963, twelve years after my early writing on deontic logic, I made a first effort to combine a logical theory of norms with a logical theory of action and change.

Whereas deontic logic in the course of the years has evolved far beyond its beginnings, the formal logical study of action still remains, I should say, relatively undeveloped. But I do not doubt that this state of affairs will be remedied with time. I have myself made some contributions to this in later years.[6] Among the work of others, I should like to mention in particular that of Krister Segerberg, who for a couple of years was professor of philosophy at Åbo Academy in Finland.

6

Action and change are what may be called *dynamic* categories. The study of such concepts is a relative novelty in logic. Traditionally, logic has been a study of the *static*, of that which *is*, rather than of that which *becomes*. (An exception was Hegel; I shall make a comment on this later.)

One reason for the awakening interest of logicians in dynamic categories has been *action*. This was how I was led to study them. Another, more important reason, has been a growing interest, not only in logic but also in science and philosophy generally, in *time* and other concepts associated with temporality.

The great pioneer in the logical study of time was Arthur N. Prior. He called the study 'tense-logic' and this has become the established name for it. In my opinion 'temporal logic' is better.

Among all philosophical logicians, Prior is the one whose work I

[6] 'Action Logic as a Basis for Deontic Logic'. *Normative Structures of the Social World*. Edited by Giuliano di Bernardo. Rodopi, Amsterdam, 1988.

felt most congenial to my own. (Significantly, Prior's first book was called *The Logical Basis of Ethics*; it did not, however, anticipate deontic logic.) The story of how my work on change-logic and his on tense-logic converged, may be worth recounting here.

The symbol 'T' introduced above is a kind of asymmetrical conjunction which may be read 'and next'. After having worked out and published a logic for it, I started to work with another asymmetrical conjunction which I called 'and then'. Its logic turned out to be considerably more complicated. I was then Visiting Professor at Pittsburgh. Prior was at the time visiting at UCLA and came to Pittsburgh to read a paper. I had until then been completely ignorant of his work in tense-logic. Meeting him—it was in 1966—made me realize that what I had accomplished in the Logic of Change (in and after *Norm and Action*) was but a small fragment of the theory which Prior had already built for the Logic of Time.

Tense-logic may be regarded as another member of that family of 'logics' which exploit the analogy with the quantifiers.—Let p again represent some state of affairs, e.g. that it is raining, Sp shall mean that it is sometimes raining. $\sim Sp$ then says that it is not sometimes raining, i.e. never raining, and $\sim S\sim p$ that it is never not raining, i.e. always raining. For $\sim S\sim$ we might introduce the abbreviation A.

The temporal triad 'sometimes', 'never', 'always' thus exhibits the same structural relationship among its members as the triad 'possible', 'impossible', 'necessary', or for that matter, 'permitted', 'prohibited', 'obligatory'. Of all members of this family of analogically related concepts, the temporal triad has perhaps turned out to be the richest in internal varieties.

Subsequent developments of tense-logic have also given birth to a study of combinations of modal and temporal concepts. I have made some modest contributions to this development in the form of a logic of what I have termed *diachronic* and *synchronic* modalities. (In the *Essay* I had actually initiated a combined study of the modal and the epistemic concepts.) The diachronic modalities deal with what *can* and *cannot* at a given time happen at some future time. The synchronic modalities concern that which *could* or *could not* have happened as an alternative to that which actually happens at a given time.

7

In traditional ('classical') logic two laws or principles occupy a basic position. They are the Law of Excluded Middle (or Third)

and the Law of (Excluded) Contradiction. The first says that any given proposition is either true or false; the second that no proposition is both true and false.

The principles also hold good in a 'normal' modal logic and its various off-shoots such as, for example, deontic logic. These 'logics', as noted above, are often called 'non-classical'. But this seems to me a misnomer. I should myself like to define 'classical logic' as a logic which accepts the two principles in question—and label 'non-classical' a logic in which the one or the other of the two laws is not (unrestrictedly) valid.[7]

In origin, the two laws are attributed to the founding father himself of the study of logic, Aristotle. But Aristotle also seems to have entertained some doubts about them, and in particular about the Law of Excluded Middle.

These doubts have also come to play a rôle in modern developments. Intuitionist logic rejects the Law of Excluded Middle. And a recent line in logical research, known as paraconsistent logic, does not unrestrictedly accept the Law of Contradiction. My own research in later years has been much concerned with these non-classical ('unorthodox') or deviant developments in logic.

It all started rather long ago. In 1959 I published an article which in many ways has been seminal for my later work.[8] Its name was 'On the Logic of Negation'. In it I exploited an observation made by Aristotle to the effect that there is a difference between denying that something has a certain property and affirming that it has the negation of this property. To use Aristotle's example between saying of a piece of wood that it is *not* white, and saying that it *is* not-white. In the second statement is presupposed that the log has a colour, different from white. In the first this is not presupposed. If instead of wood we speak of air, we could say that air is not white, since it is colourless, but not that (its colour) is not-white.

I made Aristotle's observation a basis for distinguishing between two kinds or types of negation. I called them *weak* and *strong* or, better, *external* and *internal*. Internal or strong negation entails external or weak negation, but not conversely. If something is not-white it is not white, as our piece of wood. But if something is not white it does not follow that it is not-white, as the case of air demonstrates.

I am not aware that the above distinctions had been made before in modern logic. But later they have been noted independently by

[7] Cf. above, the paper 'Logic and Philosophy in the Twentieth Century', p. 20ff.

[8] 'On the Logic of Negation'. *Societas Scientiarum Fennica. Commentationes Physico-Mathematicae*. Vol. 22, no. 4. 1959.

several logicians, and also the terms which I coined have acquired currency.

8

One can give to the topic negation a new twist by taking into consideration the notion of *truth*.

Let the symbol V (from *verum*) stand for the phrase 'it is true that'. Vp then says that it is true that p, e.g. that it is raining. $\sim Vp$ denies this, and $V\sim p$ affirms the truth of the opposite, viz. that it is *not*-raining. The two positions of the negation sign, before and after the symbol for truth, now mark the distinction between an external and an internal way of negating a proposition, between denying its truth and affirming the truth of its contradictory. *Falsehood*, one could then say, is the *truth of the negation* of a proposition.

The advantage of this procedure is that we need not assume two different concepts of negation, but can use the familiar ('classical') notions of negation and truth for distinguishing between the two different ways in which a proposition can be negated.

The challenge now becomes building a logic for this new symbol V. This can conveniently be called a *truth-logic*. But, as we shall soon see, there is in fact a plurality of ways in which such a logic (variety of 'truth-logics') may be constructed.

Consider the two expressions $V\sim p$ and $\sim Vp$. The first says that it is false that p and the second that it is not true that p. How are they related? In classical logic they are equivalent. Falsehood and not-truth are the same. We can write this down as a formula $V\sim p \leftrightarrow \sim Vp$. This means that in classical logic any given proposition is either false and not true or true and not false—as indeed the laws of excluded middle and of contradiction prescribe.

Assume, however, that falsehood is stronger than not-truth, the internal negation of a proposition stronger than its external negation. Then we have an implication $V\sim p \rightarrow \sim Vp$, but *not* its converse $\sim Vp \rightarrow V\sim p$. This means that there can be propositions which, although not true, are not false either. If 'true' and 'false' are called truth-values, such propositions have no truth-value. They fall in a *truth-value gap*. If we allow this, the Law of Excluded Middle is not valid. Not every proposition is necessarily either true or false. But the Law of Contradiction holds good. Because the implication $V\sim p \rightarrow \sim Vp$ excludes that the proposition that p could be both true *and* false.

Finally, assume that we reversed the implication and accepted

$\sim Vp \rightarrow V\sim p$ but not its converse. Now external negation is stronger than internal. What does this mean? First of all it means that the Law of Excluded Middle holds good: every proposition which is not true is false. But since we reject the (universal validity of the) implication $V\sim p \rightarrow \sim Vp$ we allow for the possibility that a proposition which is false is nevertheless also true. The Law of Contradiction, in other words, is not unrestrictedly valid. Truth-values may *overlap*.

I shall call a logic which accepts $V\sim p \rightarrow \sim Vp$ but not $\sim Vp \rightarrow V\sim p$ intuitionist-logic-like, and a logic which accepts $\sim Vp \rightarrow V\sim p$ but not $V\sim p \rightarrow \sim Vp$ paraconsistent-logic-like. A logic of the first type also holds that truth implies falsehood of falsehood and a logic of the second type that falsehood of falsehood implies truth—but not the other ways round.

The three types of logic, viz. classical, intuitionist-, and paraconsistent-like do not differ only in their base in propositional logic. There are corresponding to them three types of predicate logic and of modal (deontic, doxastic, epistemic, etc.) logic. One can characterize the difference between the three types of logic by saying that in classical logic the truth-values are exclusive and exhaustive (of 'logical space'), whereas in a logic of the intuitionist type they are exclusive but not exhaustive, and in a paraconsistent logic exhaustive but not exclusive. One can also construct logics in which the true and the false are neither exhaustive nor exclusive of one another.

9

The task of logic, one could say, is to describe and systematize the principles used in argumentation, inference, and proof. The adequacy and success of an attempted systematization is, in the last resort, not a matter internal to logic but a matter of the application and uses of logic.

For most purposes classical logic is adequate. But not for all purposes. For example, for reasoning with propositions which are *vague*, the truth-conditions of which are not well-defined, a logic of the intuitionist type may be better suited than classical logic. The same may hold good in certain branches of mathematics, as Brouwer thought. Also for dealing with some notoriously problematic topics such as antinomies or propositions in fiction, a logic which allows truth-value gaps may be more suitable than one which insists that every proposition has a truth-value. A logic of the

paraconsistent type again may be useful or even needed for dealing with situations in which one and the same subject-matter can be viewed as both falling and not falling under a given concept. Examples of such cases are when we have to capture the conceptual features of things in flux or in a process of coming to be and ceasing to exist. Some, in my opinion, fundamentally correct intuitions about this are embodied in dialectical logic in the tradition of Hegel. It is also possible that a logic which can accommodate contradictory aspects of phenomena is in fact an instrument we need in order to cope with the difficulties of a philosophical, i.e. conceptual, nature which have become notorious in the scientific study of the micro-world (quantum mechanics). The several kinds of logic, therefore, are not 'rivals' in the sense that *one* can claim to be right to the exclusion of all the rest. They supplement each other, and the way in which they are mutually related allows us to speak of a systematic variety of the forms of thought which the science of logic studies.[9]

[9] This point is more fully developed in my paper 'Truth-Logics', in *Logique et Analyse 32*, 1989.

PART TWO

THE TREE OF KNOWLEDGE

VIII

THE TREE OF KNOWLEDGE

THREE MYTHS

We all know the saying that 'knowledge is power', attributed to Francis Bacon, the English philosopher and statesman. Bacon was one of the great heralds of a new day for humanity during the important stage of development of European culture we have become used to calling the transition between the Middle Ages and the New Era.

With the saying about the power of knowledge[1], Bacon meant the following: if man understands how to question nature methodically and work on the answers, then he will also be in a position to prevail over reality, i.e. exploit natural resources and guide the forces of nature according to his plans and desires. The questions to nature are experiments. The answers are natural laws. Science as a means of power, we call technology.

Bacon never doubted that man's domination over nature would be to the greatest extent a blessing to the individual as well as to society. In *A New Atlantis*, he has depicted the happiness mankind would achieve with the aid of science. Other thinkers of the same period have also given literary form to similar dreams of a future kingdom of happiness for rational man, the most well-known being perhaps Thomas More's *Utopia* and Campanella's *Civitas Solis*.

Developments have in a convincing manner reinforced the truth in the saying that knowledge is power—in the sense the great Elizabethan intended. But we have begun to doubt the consequences of the progress of technology. The obvious fact, in itself self-evident, that knowledge can be equally well used to tear down as to build up, has been one reason why not only mankind's self-acquired happiness, but also his self-inflicted suffering have acquired previously unknown dimensions. The increased possibilities of technologically

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[1] I have in fact nowhere come across in Bacon's writings the saying in the form that has become familiar. In *Novum Organum* (lib.aph. 3) it says 'Scientia et potentia humana in idem coincidunt' or 'Human knowledge and power coincide'.

controlling reality have also increased man's desire in a manner that has become dangerous to his spiritual equilibrium. Technology, created as the servant of man, has become his master.

As literary genres typical of their time, the rationalist social utopias of the Renaissance and Baroque correspond to the present nightmarish pictures of the future of life in the technocratic society. Out of Bacon's *New Atlantis* and Campanella's *Kingdom of the Sun* have come Huxley's *Brave New World* and Orwell's *1984*. It is also illuminating that science fiction is largely gruesome reading.

So knowledge *is* power—but is it good for man to know? This is the question I shall be discussing here. As is usual in matters of a very general and comprehensive nature, the question is vague. So *one* of our tasks is to demonstrate in which different ways it can be understood and to which other questions it can be related.

The question whether it is good for man to know appears to be as old as man as a being of culture. In the discussion round it, Renaissance 'science-optimists' and the 'civilisation-pessimists' of our day represent two extremes. Their contributions are more interesting as expressions of the spirit of the time than as contributions to the solution of the problem. They are far too pointed, I would say, to be truly wise.

The perspective of our question deepens when we recognize it in some of the origins of contemplative writing and thinking in myth and saga. There are at least three naive variations in grand style of the theme of man's right to develop the rational aptitude within him. I am thinking of the Old Testament story of the Tree of Knowledge in Paradise, of the myth of Prometheus and the legend of Doctor Faust.

The Book of Genesis in the Bible contains the tale of the golden age, familiar in many quarters, when man lived in happiness and innocence, freely able to enjoy the wonders of creation. But man was forbidden to eat of the Tree of Knowledge, which God planted in addition to the Tree of Life in the Garden of Eden. Should he do so, he would—as it says—die the death. Should he eat of the Tree of Knowledge, in other words, he would be deprived of the fruit of the Tree of Life.

But man transgressed God's prohibition. So he was driven out of Paradise and since then he eats his bread by the sweat of his brow until he returns to the soil from which he has come.

Greek mythology also knows of a golden age in the childhood of man and a god angered by the wretchedness of man.[2] Zeus wishes to destroy the creatures he has created. But Prometheus feels pity

for them, steals the fire from Zeus and gives it to man. The Promethean fire is primarily a symbol of man's technological proficiencies, his ability to exploit the riches of the earth, to improve his prosperity and increase his power. But it soon also becomes a symbol of the striving of the human spirit for justice, freedom, beauty and wisdom.

Zeus' punishment of the defiant Titan became, as is known, that he was to be chained to the rock and condemned to eternal torment. And Zeus took revenge on men, who had accepted the stolen divine gift, by sending to them Pandora with the box out of which all sorrows and suffering flew over the world.

It is said that in Pandora's box there was *one* good thing: hope—man's only inalienable consolation. In the Paradise myth, there is no glimpse of light. But with Christianity comes the hope that banished man shall again be restored to favour in his Father's house.

In impressive contrast to Prometheus in the Greek saga, a character of light, is Mephistopheles, the representative of the powers of darkness in the Germanic story of Doctor Faust. When one thinks of the colossal rôle the Faust character has played in western literature, from the anonymous folk tale to the most lofty individual expression of a view of life, it appears almost a joke of reality that Doctor Faust really existed. Johann Faust was a contemporary of Luther's. He belongs to the era when the new natural science, which in Bacon's time a century later was greeted by all advanced spirits as the vigorous successor of decrepid Aristotelian scholastic philosophy, was still hovering on the borders between the black arts and rational knowledge. It is illuminating to the spirit out of which modern science has appeared that Doctor Faust was said to have treatied with the Devil in order to gain insight into the mystery of nature and control over the forces that provide pleasure, wealth and power to man. The price of this knowledge which brought power was the soul of the learned man, who, when Faust had emptied the chalice of life, was made to suffer eternal torment in hell.

It is easy to see that the three 'myths'—in future I shall call them that—briefly retold here, have something to do with the question of the relationship of human rationality to happiness and to goodness.

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[2] Descriptions of a golden age and the origins of man are very contradictory in Greek mythology. Prometheus figures in several myths with partially varying content.

Significant truths about our problem can be read in these three myths. So they are of interest to us here.

The symbolism of the three myths also has other aspects. In the story of the Tree of Knowledge, there is a profound and abstruse sexual symbol. Sensuality and the relationship between male and female are also prominent ingredients in the Faust legend. I think there is a connection between the sexual symbols of the myths and the question we are concerned with here. Nevertheless, I shall not attempt to fathom out what this connection might be.

Similarities between the three myths have naturally been noted before, particularly in comparisons between the legends of Prometheus and Faust. The myth of Paradise stands somewhat aloof on the sidelines. The comparison between the first two often applies to the main characters after which the myths are named. I do not wish to dispute that they have mutually characteristic features. But the comparison intended here, and which seems to me more interesting, is not between Prometheus and Faust, but between Prometheus and Mephistopheles. Shelley pointedly says in his preface to *Prometheus Unbound* that 'the only imaginary being resembling in any degree Prometheus, is Satan'. He is then not thinking directly of the Devil in the Faust drama, but of what he calls 'the hero' in Milton's poem about the Paradise which has been lost.

There is reason to point out that my mission in the question of the three myths is entirely one for the philosopher. One can naturally study them from many other points of view, that of the folklorist, the historian or the psychologist. I shall be deliberately ignoring those here. I think such a limitation both permissable and fruitful, but should one choose that, then one has no claim to pronounce on the 'true', in the sense of *historically correct*, content of the myths. I wish once and for all to distance myself from any such claim. But this does not prevent me from also occasionally—in passing—making observations and conjectures on the historical and psychological background behind the myths.

So the three myths do not interest us as ethnographical facts, but as topics for man's thinking on his destiny and his conditions. It is hardly necessary to say that this theme has not gone unexploited. It has recurred in great writing for over two thousand years. Some of the most remarkable existing memorials to the struggles of the human spirit are variations on the themes of these three myths.

The great writer-philosopher on the myth of Paradise is, of course, Milton. *Paradise Lost* is about the Fall of Man and the rôle the Tree of Knowledge came to play in clouding man's infant relationship to God and turning him into a rebellious, sinful and

suffering creature. Milton's other Paradise poem, *Paradise Regained*, is not in question with our problem.[3]

Aeschylus, the oldest of the great Attic tragedians, wrote three plays on Prometheus, of which, however, only one, the first he wrote, called *Prometheus Bound*, has been preserved for posterity. The contents of the two lost parts of the trilogy, *Prometheus Freed* and *Prometheus the Bearer of Fire*, we know only from fragments; the rest is guesswork. It is naturally in conscious opposition to the title of Aeschylus' remaining tragedy that Shelley called his great verse drama *Prometheus Unbound*. Goethe's two verse works on the theme, *Prometheus* and *Pandora* remained as important fragments. In Swedish literature, above all others, Victor Rydberg has dealt with the subject of Prometheus.

The life of Faust had inspired poetic imagination long before Goethe. The German 'folk book' that provided the material for Christopher Marlowe's drama *Doctor Faustus* was published in 1587. This folk book and Marlowe's play in their turn provided content and impulses for a large number of stage adaptations, among them for the marionette theatre. From one such adaptation stems Goethe's first acquaintance with what became his own poetic talent's greatest subject. Goethe's *Faust* went through a long development and a great many transformations, from the *Ur-Faust* of his youth (1773–75) to the completion of the second part over half a century later. In its final form, Goethe's work is so rich in content that it breaks all bounds of classification according to leading themes of thought. In the abundance of content in the work, therefore, the thread that interests us here can not always be clearly discerned.

The intention of this historical literary sketch has been to name a few works of literature which I have reason to stay with in what is to follow. Naturally no complete account has been striven for in this enumeration.

The three great myths in which cultural man, so to speak, has collectively expressed his intuitions on the potential for good and evil of rational ability, are thus at the same time the raw material out of which some of the highest individual expressions of man's thinking on the problem have been formed. It is natural, therefore,

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[3] *Paradise Regained* is about Jesus being tempted by the Devil in the desert. It has struck me how far behind *Paradise Lost* it stands when it comes to poetic imagery and dialectic tension. The comparison close to hand with the Grand Inquisitor in *The Brothers Karamasov* turns out to be uninteresting. On the other hand, the problem of freedom in *Paradise Lost* is worth while comparing with a main theme in Dostoyevsky.

that the observations on the subject I shall attempt here also connect with the three myths and their individualizations in poetry and drama. It is primarily the latter I shall be commenting on. But I wish at once to start by mentioning that the opinions of literary critics and aesthetes on the writing woven round our three myths concern us as little as the folkloristic and psychological backgrounds to the myths themselves. Our case is one for the moral philosopher, not one for the aesthete or the scholar. And our aim is to increase clarity on a question that is topical for modern man today, most of all owing to the dominance of the technological-scientific aspect of life in our times.

'OF GOOD AND EVIL'

In my Swedish Bible, it says of the Tree of Knowledge that it was *på gott och ont*, which in ordinary language means that the knowledge provided by the fruit of the tree could be to the benefit of man or could harm him. But this is hardly the original meaning of the myth. The thought is more likely to be that man who eats of the tree learns himself to distinguish good from evil and achieves knowledge *of* good and evil. Thus in the English Bible, for instance, it says 'knowledge of good and evil' and the German Bible says 'Erkenntnis des Guten und Bösen'. This meaning also appears in the Swedish Bible in the serpent's words to Eve, that he who eats of the tree shall become 'like God, knowledgeable on what good and evil are'[4]

So part of the biblical version of the tale of a golden age is that man in a 'natural state' is ignorant of good and evil. As long as his ignorance remains, he is happy. When he loses his ignorance, he loses his happiness.

Are we to say of man in the state of nature that he is good? The Bible does not pronounce on the matter.[5] It would probably be truer to say that man ignorant of good or evil can be neither good nor evil. However, in God's eyes there is this difference. Man is also seized with desire to learn about it and thus be 'like God'. But this is arrogance, *hubris*.

The Fall of Man does not consist of simply man defying God's prohibition. Most of all, it entails that he 'falls into sin', i.e. becomes capable of doing, and also often does what is evil. Not until the knowledge of good and evil was there did sin come into man's life.

[4] See also Gen. 3, 5.
[5] Cf however Gen. 1, 31.

A separate question is how profoundly and how hopelessly man has fallen into sin. Is man who is aware of good and evil capable only of evil if he follows his natural impulses? Can he also do good with his own strength? Or is it perhaps that he can be 'saved from evil' only thanks to the intervention of God? From these questions arise the fearful problem of the Salvation of man.

In the Bible story of the Tree of Knowledge and the Fall of Man, a great many things remain obscure. (To point this out is naturally not an 'imputation'—that would be philistine in this context.) Among other things, one is not told clearly what man's offence was. Did it simply consist in that he transgressed God's prohibition to eat from the tree, or was it also an offence of man to strive for divinity in the knowledge of good and evil? We shall soon have reason to return to this question.

In the New Testament, man is given the message 'Be ye therefore perfect, even as your Father which is in heaven is perfect'. This is one of the most puzzling and difficult Christian demands. Is it simply a moral demand—that man shall strive to be 'as good as an angel'? I think that a one-sided moralistic interpretation of this message leads to an anti-intellectual Christianity that has to be rejected. It is part of God's perfection that God knows and understands everything. The rational aptitude God implanted in man is in Himself developed to the greatest flowering. If man's task is now to become perfect, like God, then it must also be man's task to develop his rationality beyond all boundaries.

Here we are faced with something that appears to be a paradox. On the one hand man is to be 'like God', perfect also in his knowledge. On the other hand, it was while he ate of the Tree of Knowledge that man fell into sin. How can the one go with the other?

It is round this problem that Milton built his 'heroic poem' on the lost Paradise.[6] He asks his Muse to sing:

> Of Man's First Disobedience, and the Fruit
> Of that Forbidden Tree, whose mortal taste
> Brought Death into the World, and all our woe,

and his intention is to 'justifie the wayes of God to men'.

Milton is an excellent representative of the great century of

[6] I think that this is a true characterization. But it deserves perhaps pointing out—to clear away any possible misunderstanding—that Milton himself does not put the problem in the form of an apparent contradiction between the demands of the Old and the New Testament. The message of the New Testament is not mentioned in Milton's poem.

rationalism. One may ask whether such burning faith in the authority of reason in scientific, political and religious matters was ever combined with such painful insight into the tragedy of human self-sufficiency as in the great Puritan.

It is self-evident that Milton the rationalist was deeply disturbed by the question of why the Tree of Knowledge in particular should be forbidden to man.

> One fatal Tree there stands of Knowledge called,
> Forbidden them to taste: Knowledge forbidd'n?
> Suspicious, reasonless. Why should thir Lord
> Envy them that? can it be sin to know,
> Can it be death? and do they only stand
> By Ignorance, is that thir happie state,
> The proof of thir obedience and thir faith?

The reasons with which Satan in Milton's poem wishes to convince Eve on the necessity to eat of the tree must have been experienced as profoundly convincing by Milton himself. Never does Milton's rhetoric grip us more strongly than when he puts it into Satan's mouth. The Serpent says to Eve:

> Queen of this Universe, do not believe
> Those rigid threats of death; ye shall not Die:
> How should ye? by the Fruit? it gives you Life
> To Knowledge.

What is the value of man's happiness if it is bought at the price of his ignorance of the excellence of the good life and the baseness of evil? What is the value of good, if man does not know how to *evaluate* it? 'For the good unknown, sure is not had, or had/ And yet unknown, is not had at all.' And how can he escape evil if he does not recognize what is evil? (' . . . if what is evil/ Be real, why not known, since easier shunned?') The prohibition to eat of this 'Sacred, Wise, and Wisdom-giving Plant, Mother of Science' seems all too absurd to be binding.

How will Milton then explain that this prohibition nevertheless exists? He tries—if I understand him rightly—to think like this: the offence that led to the Fall of Man was not that man ate of the Tree of Knowledge, but that he defied a prohibition issued by God to test his obedience. It was almost chance that the prohibition came to adhere to *that* tree in particular. It could have applied to anything else whatsoever. The Fall of Man, therefore, has no connection with the question whether it is good for man to know, to develop his reasoning.

This answer to our question is very unsatisfactory. First, it does

not solve the paradox. Never mind that the loss of the happiness of Paradise was exclusively a punishment for man's disobedience and not for his curiosity as such about knowledge. The fact remains that God on the one hand had forbidden man to eat the fruit of the Tree of Knowledge and on the other hand had enjoined him to strive for perfection and thus also rational insight into good and evil. It is preposterous to forbid actions while simultaneously demanding the carrying out of them.

Secondly, the answer is unsatisfactory because it disengages the question of the Fall of Man from the question of the value of knowledge and reason to man. Here Milton goes too far in his rationalism. If it were pure chance that God tested man's obedience by forbidding him to eat of the Tree of *Knowledge* in particular, then the Bible myth is not only illogical from the Christian point of view, but also trite. I do not think that we can explain away what is illogical here. We scarcely have reason even to try to do so. An interpretation of the Bible free of contradictions is no longer a pressing task to enlightened man. But I do think we have reason to respect the profundity, however illogical, of the myth.

I would say Milton was right in that the prohibition to man to eat of the Tree of Knowledge cannot be based on the view that the rational aptitude in man would be an evil aptitude and that the striving to develop that aptitude to the highest conceivable perfection would be *hubris*. And I would like to add that reason inseparably belongs together with the image of God in man and that therefore a striving for perfection which ignores reason is inadequate. On the other hand, I do not wish to say that it would be sufficient for man's perfection or 'salvation' that he develops his rationality and that all other perfection will arise as a consequence of his increasing ability to reason.

Thus it could not have been an offence that man wished to *become* 'like God, knowing what good and evil are'. On the other hand, it could have been an offence that man, after having eaten of the Tree of Knowledge and having begun to develop the rational aptitude within him, imagined himself already to *be* 'like God'. 'Nor was Godhead from her thought' says Milton about Eve, after she had eaten of the fruit. This is man's special *hubris*. The Tree of Knowledge, forbidden or not, is therefore a dangerous tree for man to eat of.

Understood in this way, the myth of the Tree of Knowledge is not only a tragic story of man's disobedience to God. It is also a warning reminder of what is hazardous in the condition of man. The Tree of Knowledge provides not only knowledge *of* good and evil. It is also *for* good and evil—and the faulty translation in the

Swedish Bible unintentionally expresses a profound truth. The rational aptitude in man has double potential; one potential for good, i.e. man's growth towards the ideal, and one potential for evil, i.e. the *hubris* of man's self-divination or fancying himself as God. Which potential becomes reality in an individual man's life depends on how he makes the most of his talents, i.e. develops and makes use of his reason. Man who eats of the Tree of Knowledge is therefore taking great risks. As long as he is an ignorant being, he runs no moral risks whatsoever. He lives beyond good and evil, as do the soulless animals, and it is just as meaningless to talk about his Salvation as about his Damnation. Only after he has become aware of the distinction can these concepts be applied to him.

Into the paradoxical contradiction between forbidding the eating of the Tree of Knowledge and the demand to become perfect as God, I would read an inkling of the twofold possibilities of human rationality and a warning against the moral risks man takes when he starts relying on the decisions of his reason alone. This double potentiality of knowledge—for good and for evil—will be a *leitmotiv* of what follows.

THE TRAGEDY OF THE FIRE-BRINGER

Prometheus became a character in more recent European writing thanks to the movement that has appositely been called the Romanticism of the Age of Enlightenment. What was more natural for an age with a passion for the power of enlightenment to free man from religious and social fetters, than to recognize in the hero of Greek mythology a symbolic representative of its own highest strivings? Prometheus is the rebel, the defier of an order based on lies and denying man his natural freedom. Prometheus teaches man to rely on his own ability to think in order to expose the lie. And he teaches him to realize the absurdity of resigning himself to bids of political power and a moral and social convention that has no basis in the 'natural' order of things, i.e. the order of reason.

The Prometheus theme's first great writer, Aeschylus, was not a rationalistic optimist in the style of Shaftesbury or Shelley. And yet Prometheus' gift to man, as the romantics of the Age of Englightenment saw it, is perhaps best described in the Greek tragedian's words. He lets the Titan chained to the rock say[7]

[7] Translated by Phillip Vellacott, Penguin 1961

For mortals in their misery, hear now. At first
Mindless, I gave them mind and reason.

. . .

In those days they had eyes, but sight was meaningless;
Heard sounds but could not listen; all their length of life
They passed like shapes in dreams, confused and purposeless.
Of brick-built, sun-warmed houses, or of carpentry,
They had no notion; live in holes, like swarms of ants,
Or deep in sunless caverns; knew no certain way
To mark off winter, or flowery spring, or fruitful summer;
Their every act was without knowledge, till I came.
I taught them to determine when stars rise or set—
A difficult art. Number, the primary science, I
Invented for them, and how to set down words in writing—
The all-remembering skill, mother of many arts.
I was the first to harness beasts under a yoke
With trace or saddle as man's slaves, to take man's place
Under the heaviest burdens; put the horse to the chariot
Made him obey the rein, and be an ornament
To wealth and greatness. No one before me discovered
The sailor's wagon—flax-winged craft that roam the seas.
Such tools and skills I found for me; myself, poor wretch
Lack even one trick to free me from this agony.

. . .

. . . So here's the truth in one word:
All human skill and science was Prometheus' gift.

How then can one understand that Prometheus, this 'type of the highest perfection of moral and intellectual nature, impelled by the purest and the truest motives to the best and noblest ends', as Shelley says, be both punished by Zeus for his ventures and forced to suffer the cruellest torments? Can one see anything in the fate of Prometheus except a disturbing injustice, the victory of brute strength and violence over justice and freedom? 'Strength' and 'Violence' are also the names of the two servants of Zeus, who in the introductory scene of Aeschylus' drama are welding the Titan to the rock.

It is probably true that the romantics of enlightenment in general were far too optimistic to be able to take Prometheus' punishment altogether seriously. The triumph of violence is only a transient episode in the history of the world. When Shelley's Prometheus is freed of his chains, it is not—as in Aeschylus—because he has been reconciled with his god and has subdued his defiance. But nor does he return to man with the intention of taking revenge on the tyrant. For when the realm of truth and beauty has been installed on earth, man is to be magnanimous enough to forgive all previous suffering and injustices.

When, of Shelley's Promethean man, 'whose nature is its own divine control', it is said he shall be

> Equal, unclassed, tribeless, and nationless,
> Exempt from awe, worship, degree, the king
> Over himself; just, gentle, wise . . .

then this is not only an echo of the slogans of the French Revolution. It is also an anticipation of the Marxist dream of a stateless and classless thousand year realm that was to be the fruit of the Revolution of the proletariat against capitalist society. Shelley is one of the earliest ideologists of the English labour movement. And it is right to see in western socialism *one* formulation of the Prometheus theme on man's possibilities of rationally controlling his situation in life.

It is interesting to compare Shelley's Prometheus with Goethe's. Both writers speak in defence of human nature against gods hostile to man. But Goethe had a more realistic view than Shelley of the 'natural' conditions of life for man. So his Prometheus bears more pain than Shelley's. 'Hier sitze ich, forme Menschen,' Goethe has him say, 'nach meinem Bilde/ein Geschlecht, das mir gleich sei,/ zu leiden, zu weinen, zu geniessen und zu freuen sich'.[8]

Suffering and happiness are the Promethean man's inseparable companions. He can rid himself of suffering, only on condition that he submits to a power that also puts an end to his happiness as a free, creative being. Man's pain is therefore not an injustice, aimed at arousing compassion for his destined lot, or resentment of the powers that trample him underfoot. And it is counterbalanced a thousandfold by the pride he feels over everything *he* has done, by his own strength, with no help from the gods, a pride that speaks in the words:

> Ich kenne nichts Ärmeres
> Unter der Sonn', als euch, Götter.
> . . .
> Hast du nicht alles selbst vollendet,
> Heilig glühend Herz?[9]

The Swedish poet Rydberg's (1828–1895) Prometheus is very unlike both Goethe's and Shelley's. He is neither rebellious nor

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[8] Here I sit, making men in my own image, a race that shall resemble me, a race that shall suffer and weep, and know joy and delight.
Prose translation by David Luke, Penguin 1964.

[9] I know of no poorer thing under the sun than you gods!. . . . Did you not accomplish all this yourself, oh my holy glowing heart?

defiant, nor is he a preacher of the glorification of man. The Prometheus theme of the enlightenment romantics: the contradiction between god and man is transformed by Rydberg into an antithesis between power and justice, between the *is* of selfish arbitrariness and a timelessly viable *ought*. This is a remarkable and complete reversal of the situation. With Rydberg, Prometheus becomes in actual fact the spokesman for 'the Eternal God' *against* an inadequate 'naturalistic' man.

But Rydberg's Prometheus is not only a champion of justice. He is also a martyr. In quite a different way from that of the romantics of enlightenment, for the Swedish poet, the suffering of the Titan is a painful reality. While in Rydberg the idea of justice is central to the myth, the injustice of Prometheus' punishment also becomes more tangible. Rydberg is alien to the idea that the punishment the Titan endures because of his love of humanity was to some extent deserved. His Prometheus is guiltless—and he has to be that if the struggle between him and Zeus really is a struggle between justice and violence.

Although Rydberg is not able to admit that Prometheus bears any moral guilt, he implies in an extremely interesting way the exact circumstance that has caused *us* to bring the value of Prometheus' gifts under discussion. This occurs when the Titan describes to Ahasverus what he has done for man:

> the fire I bore down at dawn of time
> from Olympus the envied, the scholar
> used to light his torch, bearing it
> jauntily through night and mist.
> As he advances, false gods flee
> from altar smoke, the gruesome ghosts,
> disguised illusions in holy dress.
> And thus saving enchained souls,
> he also calls forth from mountains
> other thralls, a powerful Cabiric tribe,
> unfeeling, bearing no shame for their
> slavery, so that man may be free,
> breathing fire from lungs of metal,
> labouring arduously with energy and heat,
> that man may have pause to think and dream,
> for there lies the true calling of his being.

The core of these poetic-rhetorical flourishes is approximately the same as what Aeschylus says in his more direct way in the quoted words translated from his drama. The 'he' Rydberg mentions in the quote is the scholar, the scientist, whom Rydberg gives a double rôle: with enlightenment he saves human souls from false

ideas, and he improves man's external conditions of life with inventions. Rydberg's Promethean man is both a theorist and a technician rolled into one. But what is most interesting to us in this context are the 'Cabiri'. This is Rydberg's poetic clothing for the machine, the soul-less servant of man, which does not have to be ashamed of its slavery and frees human energy for higher purposes, what the poet calls 'to think and dream'. In that, man realizes the highest potentials in his nature.

It is no trivialization of the poet's idea if we express it in sober prose, as follows: for Rydberg, the break-through of industrialism was the greatest event of the time, a result of the Promethean aptitude in man. That idea is utterly correct, but Rydberg probably had no inkling that this was where the obscure point in Prometheus' mission lay. On the other hand, it could be said that one of the poet's creations did have an inkling—Ahasverus, the 'naturalist', who gave up his faith in the binding power of duty and was resigned when faced with the necessity of what was fact. Ahasverus replies to Prometheus:

> The Cabiri, in their powerful thralldom,
> that you have called forth for the good of man,
> have not made life easy for the sons of Adam,
> for now man is in the thrall of these thralls.

Rydberg was certainly profoundly aware that the industrialization of society also had its darker sides. In 'The Cave Song', in which, characteristically, only Ahasverus, no longer Prometheus, is the spokesman, his awareness of this takes on a painfully pessimistic note. But Rydberg has not hit upon the idea of combining the doubtful consequences of the victorious march of science and technology with the question of purity in Prometheus' struggle for the freedom of man. What is the value of freedom if its use leads to a new slavery for man? As soon as this question is asked, we begin to have some inkling that the tragic content of the Prometheus myth lies far deeper than simply in the triumph of violence over justice.

Here one's thoughts are led to the concepts of *hubris* and nemesis, to the awesome philosophy of equilibrium in Greek drama. Is man's enslavement to the machine, i.e. to his own inventions for the purpose of taming the forces of nature, a nemesis that follows on arrogance? And wherein lies man's arrogance, his *hubris*?

It is illuminating that the thought of *hubris*, which neither Goethe, Shelley nor Rydberg attaches to the Prometheus symbol, is clearly part of the ancient myth, and also in the greatest ancient work of art based on the myth, Aeschylus' Prometheus trilogy. The

Prometheus of the saga bears not a little similarity to Odysseus. Cunning and pride are the seamy sides of their wisdom and self-confidence. It is told of Prometheus that he not only stole the fire of Zeus, but also cheated him of the best part of man's sacrificial gifts. He cut up an ox and put the meat and edible parts in one sack, the bones in another. He soiled the first sack with dirt and the second he smeared with fat to make it look more tempting. Then he asked Zeus to choose. Zeus chose the sack of bones. Thus the best part fell to man and the rubbish to the gods.

Prometheus' trickery in order to deceive the gods was, of course, offensive. But this human weakness in him can scarcely justify a nemesis of the kind the myth deals out to Prometheus and which Ahasverus in Rydberg's poem foreshadows for the human race made happy by Prometheus. Prometheus' *hubris* must be sought more profoundly than in his individual actions. His offence cannot have been only that he stole the fire from the gods or that he deceived Zeus into choosing the wrong sack. It must also and primarily have been that he gave men means of power which they are unable to use correctly, and that he taught them to appreciate themselves more than the gods, the crown of creation higher than the creator.

Prometheus has taught man to summon from nature forces he is unable to steer and which overwhelm him. The position of the children of Prometheus is the same as the apprentice's in Goethe's ballad, 'The Sorcerer's Apprentice', who when he cannot control the forces he has invoked, complains:

> Herr, die Not ist gross
> Die ich rief, die Geister,
> Werd ich nun nicht los.

At which the Master replies:

> In die Ecke
> Besen! Besen!
> Seid's gewesen.
> Denn als Geister
> Ruft euch nur, zu seinem Zwecke,
> Erst hervor der alte Meister.[10]

If it is really true that enlightened man runs serious risks of ensnaring himself in his own ideas, Prometheus' actions are an

[10] Sir, I'm in a terrible mess. The spirits I summoned, I cannot get rid of. . . . Begone with you, Broom! Broom! To the corner of the room! For to this end you shall not be called out as spirits by anyone except your old Master.
From prose translation by David Luke, Penguin 1964.

over-estimation of himself and thus receive their natural punishment. However, it is not precluded that man, as he has been duly castigated for his arrogance, could be allowed to continue to use his reason. Something in that style must have crossed Aeschylus' mind. The most credible reconstruction of the lost parts of his trilogy indicates that Prometheus' liberation occurs in the spirit of compromise between Zeus and the family of man. The Titan's suffering was a warning that man does not rise against the gods unpunished. His liberation was a sign of grace to man, so to speak, that with the consent of the super-god above, he can continue to cultivate the aptitudes Prometheus has aroused in him.

A warning to man similar to what we thought we could read into the story of the Tree of Knowledge in the Garden of Eden, is thus also part of the myth of Prometheus, although later generations have been liable to forget this in their enthusiasm for the Fire-Bearer's good deeds to man and the grandeur of his mission. The fact that it has been difficult for more recent poets and thinkers of Europe to heed the warning is perhaps connected with a feature in the construction of the ancient myth, which there is reason here finally to consider:

In the myth of Prometheus, two powers stand against each other—an super-rational divinity wishing to decide over man according to his own lights, and a rebellious mankind wishing to take his destiny into his own hands. The rôle of the Titan is to help man and give him confidence. It would be unnatural for us to look on the destiny of Prometheus without taking his side, which is fundamentally our own. (This also applies to the myth in Rydberg's re-interpretation, for in that Prometheus becomes a symbol for what is 'higher' in man in the struggle against the selfish and iniquitous inclinations in his own 'baser' nature.) But if Prometheus were not the friend of man, a representative—as Shelley says—of what is highest in man, but only the enemy of the gods, who with his dazzling gifts wishes to tempt man over on to his side, then we have reason once again to put our choice of side to test, and then the value of his gifts becomes questionable. If we interpret the Prometheus myth in this way, we find a drama in which man is no longer the equal opponent of the divinity, but an insertion or a pawn in a trial of strength between two superhuman powers. But in this new interpretation, the defier of gods is no longer the Prometheus of Greek mythology, but the Mephistopheles of the German Faust saga.

In League with the Devil

The Faust saga could be called a Christian version of the Prometheus theme. To understand why this re-writing could be called 'Christian', we must take a look into the background of ideas that make Faust interesting to us.

Enlightened people no longer speak of the Christian Middle Ages as the Dark Ages of the spirit of man. We have learnt to look with respect, not just on the art of the Middle Ages, but also on its intellectual culture. Scholasticism cannot be dismissed as hair-splitting of the 'how many angels can find room on a pinhead' kind of question.

Our new appreciation of the spirituality of the Middle Ages, however, must not lead us astray into overlooking the profound differences between our own and the intellectual culture of scholasticism. The old conception of the Middle Ages as an era of lack of spiritual freedom contains a large portion of truth that cannot be discounted.

Scholasticism is a cultivation of man's rational aptitude ad majorem gloriam Dei, not ad majorem gloriam Hominis. The freedom of thought is to explain and praise the works of God, not to serve the human hunger for knowledge and human need for self-assertion. Thought, however, is not an obedient servant, but an impertinent rebel against alien masters. Testimony of this can be found throughout the Middle Ages. The heresies of the spirit are far older than the Reformation or any of the movements called pre-Reformation. I do not think a single great thinker of the Middle Ages escaped accusations or suspicions of heresy. Many of them had to endure great unpleasantness for the sake of their opinions. The history of scholastic philosophy for modern readers acquires much of its excitement from the fact that it is a story of the tight-rope walk of human thought on the borders of forbidden realms.

The Devil rules over those realms, trying to tempt man over the border to retain him for himself. It has not escaped his sharp eyes that man is easily led when he gives free rein to his mind and craving for knowledge. So thought is his potential ally within man. The Devil wants man to develop his rationality. But he does not desire this—as did Prometheus—because he feels friendship or compassion for him, but because he wishes for man's destruction.

The Devil holds out the prospect of the delights awaiting man, the Crown of Creation, should he use his strength to make himself into the Master of Creation. Creation—except man—is nature. To

rule over creation entails knowing the secrets of nature and being able to command her forces. It is when man strives for this domination that he most easily falls victim of the machinations of the Devil.

The most difficult task of scholastic science—a task on which it finally foundered—was to assign knowledge of nature a fixed place in relation to the revealed truth of God. The ideal was to have a physical science that could be considered to have already exhausted the truth about nature, and which therefore could not be thought to offer any unpleasant surprises in the future. The natural philosophy of Aristotle came close to the ideal, though it was disquieting that the doctrines of the system did not always match the testimony of the senses. Whom should then be trusted: Aristotle or the senses? We know what the professors in Pisa thought about the matter, when Galileo let bodies of varying weights fall from the top of the leaning tower to demonstrate that time of fall is independent of weight.[11] They considered the result of the experiment a semblance. The learned gentlemen were, of course, unprecedentedly silly. But we must regard their hidebound views in the right perspective. Superficially, this was a battle between different teachings of physics. More profoundly, it was a question of whether man will lose his soul when he allows his ideas of the world to be formed by his own judgement and reason.

We understand that the idea of an alliance between the natural scientist and the Devil was perfectly natural within the framework of the mediaeval Christian view of the world. The truth manifested in scientific experiments and which sets fruit in technical inventions may not be 'real' truth, but 'a delusion of the Devil.' Experimental natural science comes close to black art, sorcery, magic.

The relationship between religion, magic and science is an interesting topic both in itself and from the point of view of the history of ideas. As it also has some significance to our subject, a few words on the topic are relevant here.

The question of the mutual relation of religion and magic at primitive cultural stages does not concern us now. What is of weight is that at the stage of the history of western culture preceding the appearance of modern science, religion and (black) magic were regarded as opposites. This conception also includes, alongside all kinds of obsolete dross, a truth of universal validity.

One is substantially on the wrong track if in religion and magic

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[11] This story is considered to be a fiction. 'Se non è vero, è ben trovato', one might say.

one sees two competitors in the market of human superstition—although such a view also contains a grain of truth. More fruitful is seeing in the historical manifestations of religion and magic—often mixed with each other in a confusing manner—an expression of two *opposite* human attitudes. Simplifying a little, one could say the following: religion is submission, an admission of the smallness of man in face of powers on whose *grace* he is dependent. A religious attitude, as I understand it, does not need to contain anything that can be justifiably called superstition. Magic again involves a belief that the non-human forces in life can be influenced, that man—at least to some extent—has *power* over them. A magical conception of how this power is effective, however, is, contrary to a scientific conception of the matter, a superstition.

This view of the relationship between religion and magic is not original. It can be found in scholars of religion from Schleiermacher to Frazer and Söderblom. It is also subject to a great deal of debate, in which the ethnographical and historical religious material naturally plays a great part. But apart from questions of *factual* connections between the phenomena touched on, I think it clarifies matters to insist on the *ideal-typical* contrary nature of the two attitudes, here called the 'religious' and the 'magical'.

Science can also be placed in relation to the named ideal types. We then see that the widest gap is not between religion and magic on the one side and science on the other—but between science and magic on the one side and religion on the other. Science and magic have a common profession of faith: the belief in man's ability to subdue 'the powers'. Magic is pre-science. Science is magic rationalized, cleansed of superstition.

As with religion, magic is not something that occurs only at what are called primitive cultural stages. During the Renaissance, the branch of mathematics with the Arabic name of algebra was still almost indistinguishable from Cabalistic number-magic. During the Baroque period, European astronomy was still closely connected with astrology, and European chemistry was right up to the Age of Enlightenment largely synonymous with what the Arabs called alchemy.

In comparison with us, the Greeks were from the start immensely more rational. The problem of rationalizing magic into science scarcely existed for them. This is not only due to the fact that our science clearly stems from a weightier legacy of magic—from the Arabs—than ancient science, but is also due to its original relations to religion being different. Science's delivery from its womb in magic is in Europe associated with the striving to justify science to

religion. It has been a matter of showing that the scientific attitude, *in contrast to the magical attitude*, is not a presumption or *hubris* opposed to religion's demand for humility, and that scientific truth is not incompatible with religious faith. The great thinkers of the Baroque period accepted this—in the optimistic assurance that rationalism and religion could be integrated into a great philosophical system, as with Leibniz, or a grandiose poetic vision, as with Milton. A hundred years later, this task already appeared considerably more difficult, and then a distinguishing line between religion and science was being sought rather than a synthesis of both. If we look at the situation today, we surely must admit that the problem has been taken back to the starting point. Attempts to justify science to religion have failed, and the hostility between the two powers seems to be just as evident as it was before the Renaissance; the great difference, however, being that now it is science that has the upper hand and the apologist's task has been transferred over to religion which, by means of philosophy and poetry, seeks to excuse its existence to the majesty of science.

This will have to suffice as background to Faust. It should now be clear in what sense the Faust saga can be called a Christian-western version of the Prometheus myth.

In its popular form, the story of Doctor Faust is a fairly simple one, with none of the latent profundity that characterizes the sagas of Antiquity in which Prometheus occurs. Faust, the practiser of black art and astrology—in modern terminology, a scientist, makes a pact with the Devil. The conditions are that the Devil shall serve the doctor in his magical-scientific activities in life in return for Faust serving the Devil after death. The story presumes that the pact is fulfilled and that in the course of time the soul of the learned man falls to the Devil. From a Christian point of view, this was naturally a great misfortune and the arrogant doctor is depicted as a warning example.

The thematic simplicity of the popular Faust story still characterizes the first significant reworking of the theme—Christopher Marlowe's drama. Marlowe's Faustus also becomes prey of the Devil and has to suffer eternal torment after death. Faustus is damned. But when the poet pronounces his sentence, behind the words lies unmistakable compassion for the condemned doctor. Marlowe, himself a full-blooded representative of the Renaissance's enthusiasm for and curiosity about life and the world, could not escape seeing in Faustus a kindred spirit, who had indeed sinned by allowing himself to be tempted over borders permitted to man, but who, moreover, in his undaunted eagerness to investigate the for-

bidden realms, was a good representative of his time and its highest aspirations in the fields of knowledge, power and beauty. Can the being be truly evil who says:

> Go forward, Faustus, in that famous art,
> Wherein all nature's treasure is contained.
> Be thou on earth as Jove is in the sky,
> Lord and commander of these elements.

The answer must be that he who says this probably has evil in mind towards Doctor Faustus, but what he is urging Faustus to do—investigate nature in order to rule and command over the elements—in itself is not an evil, but rather something that is part of man's natural destiny.

But at the same time as Faustus with Marlowe becomes the object of our human sympathy, he becomes a problem. If his striving is right, how shall we then understand that his pact with the Devil is reprehensible? Is it an inner necessity that he who gains the whole world must lose his soul? With this question, already touched on in connection with the myth of Prometheus, we have come back to the starting point for the Faust-problem in Goethe.

It is just as well to mention at once Goethe's reply to the question, which is an emphatic No. Faust can make his pact with the Devil and gain the world without being damned. To support his opinion, Goethe is forced to revise the actual story completely. The plot of Goethe's Faust is immensely more complicated than that of the folk tale and Marlowe's. First in Goethe, the symbolism of the saga is raised to a level, which in profound and unified tension can be measured against that in the corresponding Greek myth.

Here I must remind the reader of the intrigue in Goethe's Faust, which in actual fact is fairly involved. The prologue of the drama is enacted in heaven, to which the Lord has summoned Mephistopheles. God asks the Devil about Faust and is told of his uneasy demand for knowledge, enjoyment and power. The Lord then says that despite all his errors, Faust will finally find clarity. Mephistopheles suggests a wager with the Lord that Faust will fail if the Devil is allowed to guide him.

> Was wettet Ihr? den sollt Ihr noch verlieren,
> Wenn Ihr mir die Erlaubnis gebt,
> Ihn meine Strasse sacht zu führen.[12]

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[12] What will you wager that you do not lose him,
Supposing always you will not demur
About my guiding him in paths I choose him?
Translation from *Faust* I & II, by Philip Wayne, Penguin 1949, 1959.

At which the Lord replies:

> Solang' er auf der Erde lebt,
> So lange sei dir's nicht verboten,
> Es irrt der Mensch, solang' er lebt.[13]

But trusting in man's goodness 'deep down', he agrees to the wager and gives Mephistopheles a free hand:

> Nun gut, es sei dir überlassen.
> Zieh diesen Geist von seinem Urquell ab,
> Und führ'ihn, kannst du Ihn erfassen,
> Auf deinem Wege mit herab,
> Und steh' beschämt, wenn du bekennen musst:
> Ein guter Mensch, in seinem dunklen Drange,
> Ist sich des rechten Weges wohl bewusst.[14]

The Devil then goes to seek out the doctor in his study and laboratory and offers him his services.

> Ich will mich *hier* zu deinem Dienst verbinden,
> Auf deinen Wink nicht rasten und nicht ruhn;
> Wenn wir uns *drüben* wiederfinden,
> So sollst du mir das gleiche tun.[15]

Here then is the pact between Faust and the Devil being proposed in the form familiar from the popular story. But Goethe's Faust does not agree. He thinks that Mephistopheles can help him. But he refuses to believe that the Devil could catch him in his toils.

> Ward eines Menschen Geist, in seinem hohen Streben,
> Von deinesgleichen je gefasst?[16]

he asks. In the question, the reason for Faust's optimism is also implied, the striving, the 'high endeavour' of the human spirit. As long as man does not stop contentedly to enjoy the fruits of his

[13] You shall have leave to do as you prefer,
So long as earth remains his mortal dwelling;
For man must strive, and striving he must err.

[14] Let it be so: to you is given the power
That may seduce this soul from his true source,
And drag him down with you, in fatal hour,
If you can wholly bend him to your force.
But stand ashamed when called on to confess:
A good man in his dark, bewildered course
Will not forget the way of righteousness.

[15] Then here below in service I'll abide,
Fulfilling tirelessly your least decree,
If when we meet upon the other side
You undertake to do the same for me.

[16] When was a mortal soul in high endeavor
Grasped by your kind, as your correlative?

work, but strives on in dissatisfaction, then he can be sure of escaping damnation. The convention with the Devil that Faust finally seals with his blood is therefore no pact, but a *wager*. The wager is valid as long as Faust passes the test of never ceasing in his striving.

Werd'ich beruhigt je mich auf ein Faulbett legen,
So sei es gleich um mich getan!
Kannst du mich schmeichelnd je belügen,
Dass ich mir selbst gefallen mag,
Kannst du mich mit Genuss betrügen—
Das sei für mich der letzte Tag!
Die Wette biet' ich!

(M) Topp!

(F) Und schlag auf schlag!
Werd'ich zum Augenblicke sagen;
Verweile doch! du bist so schön!
Dann magst du mich in Fesseln schlagen,
Dann will ich gern zu Grunde gehn.[17]

So Faust hurls himself into life's adventure with Mephistopheles at his side. He seduces Gretchen and murders her brother. He is initiated into the secrets of magic and dances with the witches in the Harz Mountains on Walpurgis Night. He visits the Fair Helen (of Troy) in the underworld and begets a son—a precocious and soon snatched away incarnation of Germanic will-power and Hellenic striving for beauty. He becomes Commander to the Emperor and Governor over vast areas, restlessly active even in old age, with grandiose plans for conquering from the surging sea a piece of cultivatable land for man.

As is known, Faust never pronounced the word to the *Augenblick* (the fleeting hour) that would lead to his damnation according to his agreement with the Devil. Only thanks to a misunderstanding

[17] If I be quieted with a bed of ease,
Then let that moment be the end of me!
If ever flattering lies of yours can please
And sooth my soul to self-sufficiency,
And make me one of pleasure's devotees,
Then take my soul, for I desire to die:
And that's a wager!

(M) Done!

(F) And done again!
If to the fleeting hour I say
'Remain, so fair thou art, remain!'
Then bind me with your fatal chain,
For I will perish in that day.

of Faust's last words in the death scene does Mephisto think he has captured his prey. But higher powers snatch it out of his hands, and Faust's uneasy soul reaches, after life, its symbolic repose with God.

It may seem slightly prosaic, from observations or scenes in the perhaps most many-sided and perhaps most beautiful work of poetry in world literature, to return to our question of knowledge and goodness. But the road is not long and the application exceptionally direct.

Goethe's view is clear. The power that human knowledge provides is not as such an evil. It becomes an evil if man in his delight at 'wie herrlich weit wir es gebracht' [how marvellously far we have come] stops to enjoy the fruits of his work without realizing its incompleteness or feeling the yearning for something better. *Then* man perishes. As long as his unease haunts him, he has hope.

It is probable that Goethe, had he lived, would have recognized the break-through of industrialism and the triumphal march of machine-technology as an expression of what is 'Faustian' in western man. But if he had looked into our century, would the poet have been able to keep his faith in the salvation of man through activity alone? The answer is not easy to fathom out, nor perhaps all that interesting. But it *is* interesting that the problem for us seems to be more difficult than it was during the trustful days of enlightened humanism. Western man still has far to go to the serene rationality, which Goethe's Faust yearns for towards the end of his life in the words:

> Noch hab'ich mich ins Freie nicht gekämpft.
> Könnt'ich Magie von meinem Pfad entfernen,
> Die Zaubersprüche ganz und gar verlernen,
> Stünd' ich, Natur, vor dir ein Mann allein,
> Da wär's der Mühe wert, ein Mensch zu sein.[18]

It is not a falsification if we here take 'magic' to mean, not unscientific opinions on the causal connections in nature, but as a reckless desire to rule over powers with no clear idea of the reasonable purpose of man's domination of nature. It applies even more to our time than to Goethe's that we have not fought our way 'ins Freie' [in the light] in our relations to nature, and that we have not learnt self-control in the use of the 'open sesame' of science to

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[18] I'm left to struggle still towards the light:
Could I but break the spell, all magic spurning,
And clear my path, all sorceries unlearning,
Free then, in Nature's sight, from evil ban,
I'd know at last the worth of being man.

satisfy our whims and desires. And the more strongly the awareness of our limitations forces itself on to us, the more doubtful it would be that the poet was right when he thought the Lord would calmly allow man to lend a finger to the Devil without him taking the whole hand, or that Faust's restless striving was sufficient guarantee for his final salvation. On whether one is entitled to such optimism or not, we must still seek to form an opinion.

KNOWLEDGE AS A FORM OF LIFE

The question of the value of man's rational aptitude can be put in two ways. There has been a glimpse of each way of putting it in the previous pages. But we have reason to distinguish them even more clearly from each other and to say a few words on them separately.

The question can apply to the value of knowledge as an *instrument* in order to satisfy various needs and wishes. Or it can apply to the value of man's striving for knowledge as a *form or way of life*, i.e. as a striving to know and understand for the sake of knowing and understanding in themselves and for no other purpose.

When the instrumental value is put to debate, the question is nearly always one of knowledge as a means to happiness. What is called rationalistic optimism and pessimism is usually considered as taking a stand on that question in particular. The optimists of reason of the Renaissance and Enlightenment praised rationality, i.e. science, primarily as an instrument of happiness for the individual and for society. The pessimists of civilization of our day deny this value primarily with reference to the misfortunes that two world wars and the consequences of them have entailed for mankind.

It is fairly obvious that scientific progress has had tangible consequences both fortunate and unfortunate for mankind—but also that these consequences cannot be summarized in a simple law of proportionality. If we ask who is right, the pessimist or the optimist, we must therefore answer that both are right—and both wrong. The dream of the optimists of a 'brave new world' has shown itself to be a dream come true in as far as technological improvements and potential sources of happiness are concerned. Effective medicines, swifter means of conveyance, increased prosperity on a wide scale—as Francis Bacon, Leonardo da Vinci and their equivalents put on their list of desirable things—have since become reality. The fact that this dream was nevertheless an illusion is because science, with great impartiality, has also paid

attention, apart from what was on the philanthropist's list of desires to what the Devil put on his—new ways of killing people, spreading lies, controlling opinions, poisoning everyday life with a thousand new needs and ambitions. The complaint of the pessimists about the decay of the times is justified when it draws attention to the devilry complementary to the blessings of scientific rationalism. But it becomes unjustified querulousness when it forgets those blessings themselves.

Of the two illusions, the pessimist's is undoubtedly the more foolish. The dream of a brave new world is anyhow a driving force for the mind and will to strive towards something better than what already exists. The illusion of the good old days is only a confession of our inability to keep up with developments. It is Faust's forbidden 'verweile doch, du bist so schön' [remain, so fair thou art, remain!] in its most trivial and repugnant form.

The question of knowledge as a way of life remains. Aristotle calls man a rational animal. A better definition could not be provided. Reason, rationality, is undoubtedly the feature that most clearly and profoundly distinguishes man from (the other) animals. One can say therefore that man's striving for rational perfection is a striving to realize 'himself', his 'own being', his 'true nature'. Knowledge as a way of life is for man the most singular way of life, the one in which his humanity most clearly finds expression. So it is not unnatural to think as Aristotle did that the 'theoretical life', i.e. growth in knowledge of the world and insight into vital questions is also the highest and purest happiness of man.

I mentioned previously that the Christian demand for perfection must be considered to include a demand for rational perfection. And that the prohibition to eat of the Tree of Knowledge must then be reasonably understood to be a warning to man not to think that the perfection he has to work on has already been achieved. Man is to be 'like God'. But he must guard against self-divination, i.e. the illusion of perfect self-satisfaction.

One may well ask now—does man fall more easily victim of this illusion when he strives for knowledge and education than when he strives, for instance, for wealth and influence? Is truth more flattering and therefore more dangerous to possess than, for instance, power? Is the educated man more easily self-righteous than the rich or powerful?

I do not think these questions can be answered in the affirmative. Anyone who gives an affirmative reply belittles knowledge as a form of life in a way that is reminiscent of the irrationalist's unjustified belittling of knowledge as an instrument of happiness.

But also if enlightened man no more easily than, for instance, powerful man does not stop in the 'verweile doch!' of self-satisfaction, then his situation in another respect is more full of risk. One can namely say this—to allow yourself to be flattered by truth is *a greater evil* than to allow yourself to be flattered by power. The flattered man is an object of self-deception. He thinks he is something he is not. The man who is pleased with himself because he is wise, thus demonstrates that he is *not even* wise. His self-satisfaction in that way destroys its own foundation. The man who is pleased with himself because he is powerful, does not thus demonstrate that he is less powerful. Such self-satisfaction need not undermine its own foundation. And thus, I think, we can say:

– that knowledge and education do *not* make man more easily self-satisfied than, for instance, wealth and power,

– but that enlightened man's self-satisfaction is a greater evil than, for instance, that of the wealthy or the powerful. Enlightened man 'ought to know better'. His arrogance in knowledge is a double self-deception and therefore more odious than the arrogance of the powerful in power. The *hubris* of the brain is the greatest of all.

The time has come to summarize the observations we think we have made in our reflections on the Promethean aptitude in man.

I have tried to show that however one puts the question of the value of rationality, the answer points in two directions. Knowledge is equally an instrument for happiness *and* unhappiness, for good deed *and* devilry. Knowledge as a form of life can be the highest, but also the most destructive for the individual.

I imagine it is this doubleness in man's rational potentials which gives the great myths round our subject much of their profundity and beauty. They are all tragic, either in the sense—as in the Paradise myth and the Faust saga—that they show us man torn between the two poles of light and darkness, or in the sense—as in the Prometheus myth—that they depict a struggle of man for a fundamentally just cause, but blinded by self-overestimation.

What can we learn from these insights into man's condition? At least two things, I think. The first is to reject a rationalism which looks for the value of reason and truth in various possibilities to improve man's external conditions of life, and which holds that reason alone can make man and society perfect. The second is to reject an anti-rationalism which blames reason for man's misfortunes, and which believes that of mankind only the child and the savage can be blessed. A desire to suppress the yearning of Prometheus and Faust in man is to wish to maim his humanity, or rob

him of freedom and—from a religious viewpoint—to cut off his most intimate ties with the Divine. All prospects of happiness as reward for such self-denigration are illusions, which man is capable of exposing as long as his mind works without prejudice. Anti-rationalism is the self-betrayal of humanity.

The struggle against anti-rationalism is more imperative at times when the life of the individual and of societies is poisoned by ideologies that either work against or are incompatible with the free growth of rationality in man. The struggle against rational optimism is again topical in times when life is threatened by the superficial and apathetic influence of the 'wie herrlich weit wir es gebracht' mentality. But each battle has permanent topicality throughout the history of the world.

IX

HUMANISM AND THE HUMANITIES

1

It seems appropriate to start with a few remarks about the two terms which occur in the title. Although both words, 'humanism' and 'humanities', have Latin roots, neither of them has a straightforward equivalent in classical Latin. Cicero uses *studia humanitatis* as a name for the intellectual pursuits best fitted for a gentlemanly education, or for developing what he calls a man's *humanitas*. Reading the historians and the poets was a main ingredient of such studies. In 19th century Germany *humanistische Wissenschaften* established itself as a common name for the historical and philological disciplines. One also speaks of the *humaniora*—in English, the Humanities. I think this a useful term. It has, it seems, no very firmly established connotation. Here I propose to use it for the totality of disciplines which study human nature and the achievements of man as a being capable of culture. Then it covers also the social sciences and the broad field of cultural anthropology.

The term 'humanism' too seems to be a 19th century German invention (*Humanismus*). It was originally used for referring to the Renaissance current in literature and scholarship, the representatives of which in Italy had, at the time, been known as *umanisti*. The pursuits of the *umanisti* had meant a revival of interest in the classic Greek and Latin authors. Accordingly, 'humanism', or 'neo-humanism', became a name also for the second return to the Ancients in the search of standards of beauty and style which took place in late 18th and early 19th century Germany.

With the humanism both of the Renaissance and of the Enlightenment was also connected a certain view of man, of his potentialities and their proper cultivation. Sometimes this view found articulation in a philosophy, sometimes it existed only as an implicit attitude to life and society. For this value-loaded view too the name 'humanism' has become current. When, for example, one speaks to-day of an existentialist or of a socialist humanism, what one has in mind is a philosophy of life—related maybe to views

entertained by humanists of the Renaissance or by some neohumanists, but independent of a scholarly interest in ancient history or literature. Similarly, when one speaks of the humanism of the Ancients, one is thinking not so much of their contributions to humanistic studies as of a certain philosophic interest in man and concern for human values.

In the title of this paper, 'humanism' refers to an attitude to life, an explicit or implicit philosophical anthropology. By 'the humanities' again I shall understand the scholarly study of man as a being of culture. In spite of this disparity of meaning, there is a connection between humanism and the humanities which is not only historical and accidental but also philosophical and essential. I hope this will be clear from what follows.

2

The life of primitive man is a struggle with nature. Man is, so to speak, at the mercy of his natural environment: immediate supply of food, protection against climatic changes and wild beasts—these are his basic needs. Behind the operation of natural forces man fancies the hand of benevolent or inimical super-natural beings, whom he fears and tries to soothe. The germ of a humanist attitude was laid the moment when man stopped to consider his potentialities in the fight with nature and to vindicate his freedom in face of the gods. In the myth of Prometheus, who taught man the crafts and the use of fire, we see this moment reflected in the folklore of a singularly gifted nation. It was in ancient Greece that the germ was first developed into a rational attitude to man and the world.

It has become tradition to describe early Greek rational thought as a philosophy of nature or even as a proto-science. Its grand idea was the conception of the universe as a *kosmos* or lawful order. 'Nature's law', its *arche* or guiding principle, also applies to man who is a *mikrokosmos*. Health is the natural state of the human body. By a profound medical analogy the good life for man and society was thought of as a state of health, i.e. agreement with the principles governing the kosmos. This, I should say, is the core of the humanist attitude as it appears in Greek culture.

It almost goes without saying that, on this view, natural law does not mean simply a universal regularity in the factual course of events. The law of nature is also a standard to which things must conform in order to be in accord with *their* 'nature'. Applied to human affairs, this means that the good life pursues the natural

order of things as an ideal or norm. It is worth noting that the Greek word *physis* like the Latin *natura* and our 'nature' has a double meaning. It means nature in the restricted sense of external reality, but it also means the essence or order of things.

The idea that 'the nature of nature' is a lawful order can rightly be said to constitute the foundation and backbone of what we too should call a 'scientific' view of the world. But the semi-normative understanding of it, characteristic of Greek thought, is not a scientific idea in our sense. The contributions of the Ancients to what we understand by natural science and by humanistic scholarship were not of impressive magnitude. Their great contribution to rational thought was rather the early formation of a humanist attitude. This partly explains why later currents in history which have become known as 'humanist' have almost invariably looked to Greek and Roman antiquity as a source of inspiration and wisdom.

3

During the Christian civilization of the Middle Ages the humanist inheritance of the Ancients was by no means entirely effaced. But times were hardly favourable to its further development. Nature lost its positive value-load and therewith its interest to the inquiring mind. The intellectual energies of man were directed towards the divine, to objects of pure thought beyond the evidence of our senses. It is no accident that some centuries of the Middle Ages came to be a golden age of logic—nor that this noble discipline should, with the turning of the tide in history, have fallen into a disrepute from which it has been rescued only in the last one hundred years.

When viewed against the background of the Middle Ages, the Renaissance—to quote Jacob Burckhardt's famous words—meant a rediscovery of man and of nature. But nature rediscovered was rather different from the *kosmos* of the Greeks. It was not so much a lofty ideal to be imitated by man as a brute force to be subjugated by him. Man, the crown of creation, is 'lord and commander of the elements'—to quote Marlowe's drama about Doctor Faustus. The aim of a science of nature is to make it possible for man to exploit nature's resources and put its forces in the service of human ends.

A prescientific form of this 'Faustian spirit' of Western man is the magic of the Middle Ages and the Renaissance. With the Italian *umanisti*, in particular Ficino and Pico della Mirandola, begins a rationalization of it. In the philosophic program of Francis Bacon

this process is consummated. With Bacon's name is associated the slogan 'knowledge is power'. Knowledge, for Bacon, meant in the first place knowledge of the causes of natural events. Causes are found by making experiments. Experimenting means studying the course of events under simplified and controllable and thus in a sense 'artificial' or 'unnatural' conditions. This kind of 'violence on nature' is alien to the typically Greek mind. To Western science it is fundamental. The experimentalist spirit may be said to be the mode of intellectual curiosity most typical of Western man. It had guided the alchemists in the search for the Stone of Wisdom which was supposed to bring power and riches. It made Leonardo dream of the construction of aircraft for the conquest of space. These endeavours had still to wait a few more centuries for their successful fulfilment. Of more immediate reward was Vesalius's vivisection on the tissues of the living body or Galileo's study of the laws of free fall by means of sloping planes—thus artificially 'diluting' the force of gravitation.

Experimentally founded causal knowledge provides the possibility of producing or suppressing events in nature by manipulating their causes. Gearing natural processes for the sake of attaining the desired and avoiding the shunned is of the essence of scientific technology. It would certainly not be right to say that the only or even the main motive force for the erection of the lofty intellectual fabric of modern natural science had been the wish for technological applications. But it is certain that natural science has continued to nourish the dream of a scientific technology in the service of man. With the advent of the great social change called the industrial revolution, this dream has become more and more of a reality with profound effects on human life at all levels.

4

The rediscovery of nature and of man—still to use Burckhardt's characterization of the Renaissance—also posed a new problem. I shall call it the Problem of Man's Place in Nature. For the Greeks this was no problem. The blend of fact and ideal which is characteristic of their conception of the cosmic order tended to slur over problems which become intriguing when the notion of nature's law has developed into that of a factual 'iron necessity' governing the course of all things.

In his so-called 'Oration on the Dignity of Man' the Renaissance humanist Pico della Mirandola had expressed the idea that man,

alone among God's creatures, has no fixed place in the great order of things. It is up to man himself to choose his place, what he will be: beast or angel or something in between. In the terminology of mediaeval scholasticism Pico's idea amounts to saying that in man existence precedes essence—a formula for human freedom familiar also from modern existentialism.

Pico also wrote a treatise against astrology. It is false and unworthy of men, he says, to believe that human destiny is predetermined by the constellations of heavenly bodies and other 'signs in the sky'. Astrology, however, was a strong influence at the time, a lingering variety of protoscientific magic. Pico's attack on astrology was met by a counter-attack by no less than Johannis Kepler, one of the founding fathers of modern exact science. Kepler was deeply convinced that human affairs depend on the mutual positions of the stars. We may think this a most unscientific view. But, abstracting from the element of superstition in it, this is also a conviction that man *has* a fixed place in the cosmic order, that human affairs too are governed by inexorable laws of the universe. To have this conviction may be to overlook something essential about man. But it can hardly be labelled a superstition. It would be more right to call it an implicit philosophy of man which has been continuously nourished, since the days of Kepler, by the victorious progress of science.

The positions of Pico and Kepler typify two stands on the question of man's place in the world-order.[1] One could call them a *humanist* and a *naturalist* attitude. It goes without saying that the opposition between them is also relevant to the question of the place of the Humanities in the totality of the *Wissenschaften*.

5

Renaissance humanism had acted as a catalyst or midwife for an exact science of nature. This new science, moreover, promised man domination over nature. But it did not teach man the mastery over himself of which Greek humanism may be said to have been in search. The rediscovery of man to which Renaissance humanism contributed was not so much the establishing of a self-searching

[1] For the comparison and contrast Pico-Kepler I am much indebted to the excellent introduction by Rolf Lindborg to his translation into Swedish of Pico's 'Oration'. Rolf Lindborg, *Giovanni Pico della Mirandola, Om människans värdighet*, Publications of the New Society of Letters in Lund 71, Lund 1974.

attitude as the liberation of artistic and intellectual energies from the constraints of received religious authority. It inaugurated a process of secularization which has, since then, been steadily progressing.

Man's search for himself had still to await a new wave in the movement of humanist thought. This wave was the humanism of the Enlightenment. Just as Renaissance humanism belongs in the setting of the troubled times of religious reform, neohumanism must be seen in connexion with the great social upheaval of the French Revolution and the consequent unrest of the Napoleonic era. The lesson taught by the external drama of the time could perhaps be summarized as follows:

Man unleashed from received secular and spiritual authority is a beast, who has to be tamed before he can make proper use of his freedom. The taming of the beast is the education of man to a dignified and enlightened human being. In Germany, the homeland of the humanism of the Enlightenment in much the same sense in which Italy had been the cradle of Renaissance humanism, the two humanist catchwords of the time were *Bildung* and *Erziehung*.

Like their Italian precursors the German neohumanists looked to the Ancients for their ideals of beauty and culture. But this traditional 'humanist nostalgia' was now coupled with a much more profound classical scholarship and a new understanding of humanity's past. The study of history and languages and human *mores* was placed on a new footing early in the 19th century. Gradually, what we call the social sciences too established themselves on the academic stage.

The humanism of the Enlightenment thus gave origin to a scholarly study of man and his society, deserving the name 'scientific' in the German sense of *wissenschaftlich*. The 19th century is the era of the great classics in the Humanities. Niebuhr, Ranke, and Mommsen were the Copernicus, Kepler, and Galileo of historiography; Wilhelm von Humboldt, Jacob Grimm, and Rasmus Rask those of the study of language; Marx, Durkheim and Weber those of sociology.

6

The developments which led to the birth of the humanities did not by themselves much affect our views of man's place in nature. A revolutionary impact on these views, however, came from 19th century natural science—chiefly from Darwin and the theory of evolution. The upheaval in ideas brought about by Darwin's theory

is comparable only to the effects which the Copernican system and the subsequently emerging view of the infinitude of the universe had had on the human world-perspective two or three centuries earlier.

In the footsteps of Darwinism followed a deterministic naturalism which in many ways can be regarded as a reaction against the libertarian idealism of the era of neohumanism and the French Revolution. The humanities, though born in the atmosphere of idealism could not fail, in their growth to maturity, to be affected by the prevailing climate of naturalism. The question What is man's place in nature? is from now on paralleled by the question How are the humanities related to the natural sciences, the scientific study of man to the scientific study of nature?

Two confronting positions on this last issue mirror the attitudes of Pico the humanist and Kepler the natural scientist. It is interesting to note that in the two major figures who have most profoundly influenced our understanding of man and society, Marx and Freud, the two attitudes strongly intermingle. It has become the fashion to speak of two Marxes: Marx the humanist who put emphasis on man's possibilities of emancipating himself from exploitation and slavery and of overcoming alienation, and Marx the historical materialist who in the evolution of society saw the working of 'iron laws' concerning the interplay of productive forces and productive relations. It is usual to connect the two attitudes with the young and the mature Marx—and there is *some* truth in this. But the more interesting fact about Marx is that the two attitudes are both present, implicitly, in his work as a whole. Therefore all those for whom Marx continues to be a source of inspiration—philosophers, social scientists, and the exegetes of various socialist creeds—are likely always to fall back, now on one, now on another of the potentialities inherent in this strangely contradiction-loaded thinker. Something similar holds true of Freud. His theorizing largely follows the pattern of 19th century 'naturalist' medicine and psychology with their implicit determinist view of man. That Freud's insights can be given a very different—and from the point of view of therapy probably much more fertile—interpretation is evident from modern trends in psychiatry and what is nowadays sometimes called 'humanist' psychology.

7

The polarization implicit in these giants of thought is explicit in opposed trends in 19th century philosophy of science. The philosophy

of the naturalist trend is known as positivism. Its early protagonist was Auguste Comte. Comte saw in the emergence of a science of society the last stage in an evolutionary process of liberation of rational thought, first from the tutelage of religion and then from the illusions of metaphysical speculation. Mathematics and astronomy with the Ancients, physics since the Renaissance, chemistry and biology since the Enlightenment had already entered the 'positivist' stage. Now it was the turn of the humanities. The older and more mature members in this ancestral tree set the pattern for the younger members. Thus mathematics for physics, physics for the other natural sciences, and the natural sciences for the social sciences. For the last Comte also uses the name *physique sociale*. The uniform line of descent is a warrant of the Unity of Science. It is illuminating to compare Comte as the philosophic herald of a new science of man with Bacon as a herald of a new science of nature. Neither one of the two visionaries made a contribution to the actual progress of science. Comte's understanding of history and society is as poor compared to Marx's as is Bacon's understanding of physics compared to Galileo's. Both Comte and Bacon were imbued with belief in the usefulness of science as an instrument of human progress. The French positivists' famous characterization of the aim of science as *savoir pour prevoir pour pouvoir* is the technological spirit in a nutshell. When applied to natural science it means man's mastery of nature. When applied to the humanities it does *not*, however, mean anything which could reasonably be called man's mastery of himself. The slogan rather suggests a use of scientific knowledge about men for purposes of manipulating human beings for various ends and goals. Whose ends and goals—and manipulation by whom? These questions have obvious answers when we deal with a technology based on natural science. For the social technology based on knowledge of human beings they constitute a grave and open problem.

8

I do not think one can answer these questions without also challenging the philosophy of science which made it urgent to raise them. The challenge was actually made towards the end of the last century in the form of a reaction against positivism. The reaction aimed at defending the autonomy of the humanities in relation to the natural sciences. Various efforts were made to capture the essential differences between the two types of inquiry and in par-

ticular to tell wherein the peculiar character of the humanities consisted. Windelband described the difference with the terms *nomothetic* and *ideographic*: in the study of nature we look for generalities and laws, in the study of man and human creations we are interested in the individual and unique. Dilthey exploited the difference between explanation and understanding (*Erklären* and *Verstehen*). The natural sciences explain phenomena by subsuming them under laws; in the *Geisteswissenschaften* we try to understand their meaning and significance.

This early hermeneutic or interpretative philosophy of the humanities was, however, an episode rather than the beginning of an era in the history of thought. Soon positivism made its return—this time equipped with the powerful methodological tools of modern mathematical or symbolic logic. In its heyday between the two wars, logical positivism thought that it had swept the philosophic stage clear of metaphysical rubbish once and for all and laid the foundation of a *wissenschaftliche Weltauffassung*. The enthusiasm was soon tempered, but a lasting impact of the new positivism came to prevail in the diverse currents and trends which can be subsumed under the elastic label of 'analytical philosophy'. Heterogeneous as this phenomenon is, it is still possible to speak of a characteristic climate of opinion in philosophy, ultimately inspired by the positivism of the Vienna Circle and by what used to be called the Cambridge School of Analysis. This climate has long prevailed in the English-speaking countries and in Scandinavia and is making headway, it seems, also on the European continent. In this tradition great contributions have been made to logic and the study of the foundations of mathematics, and to the methodology and philosophy of the natural and other 'exact' sciences. But I should say without hesitation that the contributions to the philosophy of the humanities have been remarkably poor. This fact reflects, I think, a *Zeitgeist* which is uncongenial to humanistic thought and study.

9

The failure of behaviourism, positivism, logical empiricism, and other 'naturalistic' trends in the philosophy of science to provide a satisfactory philosophic basis for the humanities is, in my opinion, due to something I should call *conceptual poverty*. The phenomena which the humanities study have features of their own which distinguish them logically from the typical objects of study in the natural sciences. A primary task of a philosophy of the humanities

is to try to capture and do justice to those features. The task can perhaps be completed only through a long process of change and maturation in an intellectual climate of opinion. What I can do here is only to indicate a direction in which I think we should proceed in the search for a more adequate philosophy of the humanities than any which has so far been suggested.

10

I characterized the humanities as the study of man as a being of culture. This suggests that the phenomena which the human sciences study are, somehow, 'cultural'. What this means, however, can be understood only if we first pay attention to another, more basic, feature of human phenomena. This is their *intentionality*.

Saying that intentionality is a characteristic of phenomena connected with human culture is, roughly, saying that those phenomena have a *meaning*. A special case of this is linguistic meaning. Another is when the meaning is something aimed at or pursued through the phenomenon in question. In the first case, the bearer of meaning is a 'text', i.e. a document of language. In the second case it is either the action of some individuals or groups or a practice or an institution of society. These two types of meaning, moreover, are closely interwoven. The subject matter of a text is often intentional phenomena. Indeed, without the records which texts provide, a major part of humanistic study would be strictly impossible. Mankind would then have no *recorded* history. But more than this; all forms of human life which can be called instituted and the perpetuation of which is called, in a wide sense, 'tradition' depend on the fact that man is a speaking creature. Were not man a being of language, he would not be a being of culture either—and he would literally have no *history* different in character from that of any other zoological species.

However, we must not exaggerate the uniqueness of man's position in the animal kingdom. Intentional, meaning-carrying phenomena are not exclusively human. Nor are they necessarily language-dependent. It is not anthropomorphism to attribute to a dog fear of punishment consequent upon some mischief. But it would be anthropomorphism to attribute to it remorse at having snatched a piece of meat from the butcher's shop. This is so because remorse is a much more developed form of intentional reaction than fear—and probably one which is inconceivable without language and interpersonal relations under rule.

The recognition that intentionality and language are characteris-

tically even if not exclusively human will help us see, why the conceptual frame of physics, chemistry, or biology is not sufficient for an account of human phenomena in their fulness. In order to understand man as a being of culture concepts are needed which simply have no *application* to, say, mice and rats, not to speak of inanimate objects. Therefore it is a mistake to think that the concepts which suffice for describing and explaining physico-chemical reactions or even sub-human forms of animal behaviour could, either by themselves or as a reduction basis for complex logical constructions, exhaust the conceptual store of the humanities.

To make this statement is, of course, not to prove it true. A philosopher of a positivist orientation would probably also agree that intentionality is a characteristic of everything connected with human culture. But he would deny that intentional phenomena are irreducible to non-intentional ones. In defence of his view he might, for example, put forward a behaviourist theory of meaning.

11

Intentional phenomena have to be *understood* and, when this is connected with difficulties, *interpreted*. Understanding their meaning or significance precedes any attempt to explain their existence or origin; this is one difference between intentional and non-intentional phenomena. It is therefore not inappropriate to call the humanities *hermeneutic* or *interpretative* disciplines.

Calling the humanities hermeneutic and saying that meaning is a characteristic of the phenomena which they study is also to touch on a grave philosophic problem. What is meaning? This question has been very much at the centre of 20th century philosophy. No-one could dispute, I think, that the philosopher whose thoughts in the area were most influential and most original was Wittgenstein. He had no clear and simple answer to offer. But from what he has said about intentionality, language, and meaning useful hints can be got also for that which was *not* Wittgenstein's immediate concern, viz. a philosophy of the humanities.

A basic thought of Wittgenstein's is that a 'private language' is impossible. Language is essentially a 'social affair'. The same holds true also of extra-lingual meaning—at least on the human level.

Saying that meaning is a social affair has two important implications. The first is that meaning is something which is handed down, 'tradited', within a community and therefore has to be learnt and taught. The second is that meaning is intimately connected with

action. To learn a first language is not to be given a catalogue of names of objects and perhaps some rules of correct speech. It is to grow up to take part in the life of a community, to learn 'how to do things with words': calling persons, asking for objects and for help, reacting to commands and warnings, answering questions—at a later stage also describing things and events and speaking about what is not immediately at hand in space and time. In order to understand the meaning of actions and words, one must therefore either be another member of the same community or otherwise become familiar with, i.e. learn to participate in, its 'culture' or ways of life.

12

Both understanding *what* intentional phenomena mean and explaining *why* they occur makes reference to rules. Just as we cannot understand speech without mastering the rules of linguistic practice, we cannot grasp the significance of or the reasons for most human actions without knowing the conventions and regulations, say, for greeting people, honouring the dead, driving and parking cars, getting commodities against payment, transacting one's daily business in the rôle of official, employer or employee, teacher or student, child or parent, etc. Also most human wants and needs—with the partial exception of those which we share with other species of the animal kingdom—get articulated in the set frame of societal rules and institutionalized patterns of behaviour.

One can make a useful distinction between rules which define a practice and rules which prescribe what ought to or may or must not be done, between constitutive rules and regulative rules, as one sometimes calls them. Then one can give a summary characterization of the way rules relate to explanation and understanding of behaviour by saying that constitutive rules make us understand the meaning of actions—e.g. how bowing to a person can be a way of greeting him—and that regulative or prescriptive rules explain why actions are done—e.g. that I stopped my car because the red light appeared.

13

I shall now advance a thesis which I am sure many will find controversial but which I think is true and, moreover, crucial for understanding the methodological status of the humanities and the

relation of the humanities to the sciences of nature. The thesis goes as follows:

Just as natural, i.e. non-intentional phenomena are 'governed' by natural laws, i.e. principles which tell us either what will invariably or in statistical average be the case under in principle recurrent and repeatable circumstances, in an analogous manner intentional phenomena are 'governed' by normative rules which tell us what people under given circumstances are (or were) expected or allowed or practically necessitated to do. I am, in other words, pleading for what might be called a 'methodological parallelism' between natural laws on the one hand and laws and other societal rules on the other hand. I am inviting the reader to see the difference between the humanities and the natural sciences in the light of the difference between the factual and the normative, between rules which state how things in fact go and rules which ordain how they should go according to the conceptions of those who instituted the rules.

14

It might be objected that what I have said holds true at most only for those humanistic disciplines which are in a strict sense historical.—Undeniably the normative web which gives a meaning to the actions of individuals and regulates life in society sets the frame of reference for any account of human affairs we call 'history'—from naive chronicle and narration to the most ambitious attempts at understanding the significance of events and explaining their connections.

Consider narration. An account which limits itself to telling 'wie es eigentlich gewesen' in the most straightforward sense of this debatable slogan will primarily be about the individual and collective actions of men: how they built and organized their communities, how they cultivated the land, how they traded, waged wars, worshipped and observed various ceremonies—also of the decisions and heroic deeds of great individuals at momentous stages in the peoples' lives. Even if such a story is being told quite naively in the sense that it does not aim at explaining anything, it would not be intelligible unless it described the agents' actions in terms of the institutionalized behaviour-patterns which alone give the actions a 'meaning'.

History, however, is not only chronicle, it is also 'explanation'. We want to know why the actors on history's stage performed as

they did—how their actions were motivated by their personal aims or by their duties in assigned rôles as kings or governors or priests or judges, say. We also want to estimate the significance of their actions to later developments, i.e. to see how what they did—for whatever reasons—in its turn became a factor in the motivational background for the actions of other people. We can call such explanation 'causal' if we wish. But 'causal' does not then mean 'nomothetic'. The historian does not unravel laws which made events inevitable. He interprets what took place as adequate responses within given institutional frames to the aims and ends towards which human action was directed. Sometimes what happened will appear inevitable in retrospect—as a practical necessity under the circumstances, but not as a causal or natural necessity under the impact of a universal law.

15

Someone who agrees to this may yet argue that it only shows how different history proper is from the non-historical study of man as a being of culture in the social sciences or in linguistics and philology. Do not the non-historical humanities aim at the discovery of law-like regularities of various forms of human behaviour: economic, political, religious, etc., in much the same way as the natural sciences investigate law-like regularities among natural phenomena? Maybe it is vain to look for universal laws in history, but surely there are laws of economics, for example. This we need not deny. But I would maintain that the situation with regard to laws in economics is not as like the situation in, say, physics as some wish to think and not as unlike the situation in historical research as it may appear. Also in the overtly non-historical study of human phenomena there is implicit an essential element of historicity. Not to have recognized this is, I think, a valid criticism which can be levelled against much of contemporary research in the social sciences. I shall try to illustrate what I mean with a very simple example.

Suppose someone wanted to explain the fact that all silver coins vanished from circulation and only paper money remained in the market during, say, the temporary occupation of country *X* by power *Y* in an armed conflict, by reference to what is known as Gresham's law. To say that coins ceased to circulate because there is a law to the effect that, when two kinds of money of unequal exchange value are available for payments, the one of inferior value

tends to drive the one of higher value out of circulation—to quote the standard formulation—sounds to my 'logical ear' like a joke and I hope that my readers, upon consideration, will share my feeling. Compare this with the following case:

Suppose we explain—to paraphrase a famous example—the bursting of a waterpipe during a frosty night by reference to the law that water expands when it freezes. If one is curious one can ask why water expands when it freezes. But whether or not this question is raised and can be answered, one will understand why the pipe burst—and if one is incredulous one can make experiments and watch the result. One need only accept the law as fact in order to admit that it has explanatory force.

It is different with Gresham's law. It has no explanatory power *of its own*. Unless we understand *why* 'bad' money should tend to drive 'good' money out of circulation, mere reference to the fact that it does so does not make what happened a whit more intelligible. To understand why 'bad' money drives 'good' money out of circulation is easy enough, however—but to understand why water should expand when it freezes is not at all easy. If people fear that the paper money issued by the occupying power will be declared valueless once the occupation is over, whereas silver coins will at least retain their metal value, then it is clear that people are reluctant to give away what they have in silver and maybe even anxious to buy up coins in exchange for paper money at a nominal over-value. This is a thoroughly understandable motivational mechanism. We have seen impressive examples of its working. To have drawn attention to this is a merit for which Gresham deserves to be remembered. But even if nobody had ever thought of this as a 'law' of economic behaviour, we could readily have explained in an individual case why 'bad' money drove 'good' money out of circulation. What is required is only familiarity with the institution of money and the idea of a market—and, one could add, with 'human nature', i.e. the needs and wants of normal men in a society which knows these institutions.

In order for so-called laws of economic, political, and other forms of social behaviour to have explanatory force, we must first understand *why* they are valid, i.e. we must know the institutional frame within which behaviour in accordance with the law is an adequate intentional response to the challenge of a given situation. Therefore, when the institutional frame changes previously valid laws may loose their applicability to otherwise similar situations. Thus, for example, it has often been noted that the laws of 'classical' market economy cannot be expected to hold good for the strongly

'manipulated' market characteristic of late capitalist societies, nor for rigidly planned socialist economies.

In this difference in the nature and rôle of 'laws' one of the *deep* differences between the natural and the human sciences manifests itself. And for reasons connected with this I would claim that the so-called non-historical behavioural sciences are not really 'non-historical'. Theorizing about economic and other forms of social behaviour means devising conceptual schemas which can be used for the analysis and interpretation of phenomena in given historical situations—such as, for example, present-day Western industrialized society. The use of theory in the human as well as in the natural sciences is for explaining and making us better understand the world in which we live. But since the world men build for themselves, i.e. social reality, changes as they go on building it, its explanatory principles—and not only our knowledge of them—will change too in the course of this process.

16

I shall conclude with a return to the question which arose with Renaissance humanism concerning man's place in the world-order. We are now in a position to assign both to Pico the humanist and to Kepler the scientist a due share in the truth. But the greater share belongs, I think, to Pico.

By saying that man has a place in the world-order we could mean that human actions and institutions can be explained in terms which are extraneous to the individual agents and to the institutions in question themselves. Maybe some human phenomena have a spontaneity which defies explanation; and the same may hold true for some natural phenomena. But by and large this is *not* the case—neither in nature nor even with man. Events in nature have causes and what men do and achieve has reasons in terms of which we understand and explain them. To this extent we may say that Kepler was right against Pico.

But in a most important sense we can also say that man's place in the world-order is not *fixed*, if by 'fixed' we mean determined by factors which are extraneous to human action. There are, of course, biological aspects of human life, which makes man's position in this sense fixed too: environmental conditions of temperature, composition of the atmosphere, possibilities of nutrition, etc. But the phenomena specific to man as a being of culture are different. The factors in the terms of which we interpret and explain those phe-

nomena are the creation of man himself: the level of knowledge and technology, the educational institutions, the force of custom and tradition, the normative fabric of the legal order. Once these factors are 'instituted', their determining influence on individual action may extend to minute details of life and even seem like 'iron necessities'. But it would be a fatalistic misunderstanding not to realize that they are man-made and therefore subject to change effected by man himself.

The destiny of men therefore is not written in the stars—either in the literal sense Kepler had in mind and we regard as superstitious, or in the extended sense which alone makes Kepler's idea worth taking seriously, viz. that the achievements of men are the predetermined results of forces over which man has no control. If one calls the place of man in the order of things 'fixed' at all, one should remember that the one who fixed it was man himself—though by no means always those men whose actions now are guided and whose freedom is restricted by the rules of the 'fixers'. The possibility is always open that men will refuse the order under which they live and re-fix their place in the world.

X

IMAGES OF SCIENCE AND FORMS OF RATIONALITY

1

We usually associate rational thought and action with such attributes as consistent reasoning, well confirmed beliefs, and an ability to predict and, maybe, control the course of events in nature around us. We may justly regard *science*, as it has evolved from the late Renaissance and Baroque periods to the present day, as the ultimate achievement of rationality satisfying these requirements.

Chiefly thanks to its explicative and predictive powers, Western science has yielded an immense *technological* pay-off with profound effects on human life. To the extent that these effects have been beneficial and welcome, they have also enhanced the prestige of science and of the type of rationality embodied in scientific thinking and practice.

It is becoming increasingly obvious, however, that the transformations of life effected by science and technology are not exclusively beneficial. The industrial state is facing serious problems due to pollution and poisoning. The new lifestyle has psychological repercussions in the form of alienation and stress. Moreover, there is the threat that the world's natural resources will not suffice for the needs of growing populations and, last but not least, there is the threat from weapons of unparalleled destructiveness.

These worries of mankind have challenged reflective minds to question the impact of scientific technology on life, and therewith also the value of the type of rationality which science represents. 'The rationality debate' is one of the main themes of contemporary philosophy, sociology, and social anthropology. The debate has perhaps been more confusing than clarifying, but at least it has taught us that human rationality is a multidimensional thing possessing many aspects *other* than those which have reached their fullest maturity in Western science.

For my purposes here I shall exploit a facet of this multidimensionality which in the English language is conveyed by the words *rational* and *reasonable*. An argument can be rational but its

premisses and conclusions may be unreasonable. A plan may be rational, but its execution not reasonable. What, then, is the difference? As I see it, rationality when contrasted with reasonableness has to do, primarily, with formal correctness of reasoning, efficiency of means to an end, the confirmation and testing of beliefs. It is *goal*-oriented— though in a sense somewhat broader than Max Weber's notion of *Zweckrationalität*. Judgements of reasonableness, again, are *value*-oriented. They are concerned with the right way of living, with what is thought good or bad for man. The reasonable is, of course, also rational—but the 'merely rational' is not always reasonable.

A science in search of the reasonable we encounter in our intellectual ancestors, the ancient Greeks.

2

Discussing 'Greek science' in a general way risks bias and oversimplification. Yet the risks are worth taking for the sake of coming to a better understanding, if not of the Ancients, then of ourselves.

The mental attitude underlying Greek science and speculation is a belief that the human mind is capable, on its own, of deciphering the *logos* of things—just as the Renaissance pioneers of modern science were convinced that 'the book of nature' lay open to be read and understood by human beings. One could call this a belief in the *intelligibility* of the natural order of things. It is, I should say, the common rational foundation of anything which is properly called 'science', whether in the Greek or in the Western sense.

For the Greeks the natural order was a *eunomia*, i.e. a lawful and just order. Their universe was a *kosmos* and, as such, good and beautiful. The birth of Greek science is simultaneous with a profound change in their society, viz. the transition from aristocratic feudalism to the law-regulated order of life in the *polis*. It has been said that their conception of the world order was in origin a projection onto the universe of the idea of the legal order in a human community. By a curious re-projection of thought, this order was then conceived of as an ideal pattern which the law of the state had to imitate and reflect.

Not only the state but also the human individual is, ideally, a *mikrokosmos* in harmony with the universal order. This holds good both for the body and for the soul. Thus the moral and spiritual life of man has an ultimate foundation in the *eunomia* ruling the universe. To try to understand the world order was to look for

landmarks or guidelines for the right way of living and of organizing the human community. To attain such understanding was to attain *wisdom* rather than knowledge; it was, as has been said, to *attune* one's life to its 'natural' conditions.

If this picture of Greek science is even nearly correct, then some might wish to conclude that the Greek image of a science was based on an enormous confusion. The alleged confusion is between laws as norms regulating human conduct and laws as descriptions of factual regularities in nature.

But such criticism is essentially unjustified. In order to confuse, a distinction must already exist. And the Greeks simply did not distinguish, as we do, between law as norm and law as description. Their view of nature as a lawful order cannot be adequately expressed within a conceptual frame which observes these distinctions. Our view and theirs are *incommensurable*. This means, as far as I can see, that we *cannot* (fully) understand 'Greek science'. Saying, as indeed I did, that the Greeks conceived of nature as a lawful order to which human life might become attuned, is not strictly accurate, since it requires us to understand the idea of nature's law in a way which is *both* norm *and* fact. This we cannot do—and therefore the idea is, *to us*, a 'confusion'.

If what I stated about incommensurability is right, it has an important consequence: there is no possibility of 'return' to the 'Greek way of thinking'—for example a return to a view of the good life or of a just society as a 'microcosmic' reflection of a cosmic law. Yet within our society are tendencies—I would myself label them anti-rational—to fancy that something like this is possible and maybe even needed for a solution to our dilemmas. But this is self-deception and false romanticism. Innocence once lost cannot be regained.

3

Some ten thousand years ago a profound change took place in man's way of life. This was the origin of agriculture. In this change, a form of human rationality manifested itself very different from the one which was later to flower in Greek science. It was the goal-directed use of reason for foreseeing changes and regularities in the course of events in nature and for taking measures to utilize, control and steer those events for human purposes. The transition to agriculture also meant that the manufacture and use of tools was greatly enhanced. A new type of man evolved, the artisan or *homo*

faber. Among his skills were not only the manufacture of tools, armour and weapons, but also the construction of the more permanent abodes and protective enclosures required by the new form of food production.

By *technics* one can understand the production of artefacts of any kind, and by *techniques* the skills needed for these productive activities. And one could make a distinction between technics and *technology*. Technology, one would then say, is technics and technical skill based on scientific knowledge, knowledge of the *logos* of the *techne*, i.e. of the rational principles underlying the art which the artisan-technician practices.

That there can be highly developed technics without scientific underpinning is well attested. That there can be refined science without technological pay-off is also obvious. Greek science is an example. I shall hazard a play on words and say that Greek science embodied the rationality of *homo sapiens* but not that of *homo faber*. The first is *wisdom*, the second *skill*.

One could also refer to this dualism with the words 'nature' and 'art'. Ancient science contemplates the natural; technics has to do with the artificial. For this reason *mechanics*, which can rightly be called the very root-discipline of modern science since the Renaissance, was not in the Ancient tradition a science of nature, i.e. of the natural, but was concerned with artefacts such as the lever which could force heavy loads to move in, for them, 'unnatural' directions. It is characteristic that the Greek term for mechanics, *mechanike techne* derives from a word (μηχανή) which in origin means 'cunning' or 'trick'. Tricks may be extremely useful to know and practise, but they were not worthy objects of study by the *kaloskagathos* or Greek 'gentleman', who in the lawful order of nature saw a guideline for the right way of living.

4

So-called Arabic culture occupies a middle and also a mediating position between Greco-Roman and Western civilization. One of its outstanding features is the rôle played in it by *magic*.

The practice of magic is a goal-directed activity. Its aim is to conjure up or placate the 'powers' which govern the natural processes or lie dormant in material stuffs so as to make them benevolent or subservient to various human ends and wishes. Alchemy, astrology, the cabbala, are forms of magic which flourished in the orbit of Arab culture and which made a strong impact on spiritual

life in Europe during the first formative centuries of what was to become distinctly Western science.

Was this magic of the Middle Ages 'science'? Did it rest on a belief in the intelligibility of the world order to the inquiring mind—like Greek philosophy or modern natural science?

These questions are difficult to answer. But surely in the magic of the Middle Ages we can discern a craving both for sympathetic attunement of human affairs to principles governing the universe and for techniques to control and master the 'forces' in nature. In the first feature 'magical science' resembles Greek science, in the second, ours.

With a view to this second feature, medieval magic has been held to be a precursor of modern science. There is about as much truth and as much falsehood in this as there is in the view of the Ionian cosmologists as early natural scientists. Basically all three: Greek philosophy, medieval magic, and modern science, are incommensurable manifestations of human rationality. I am sure we cannot in our conceptual categories fully understand the mind of the *magi* or the wisdom of the Presocratics. But to the extent that we can, or think we can, discern an aim common to ours and to one or other of those earlier efforts to understand 'was die Welt im Innersten zusammenhält' (what is inside the world and holds it together), as Goethe put it in *Faust*, we can also compare them with regard to failure or success. It is a fact that magic *and* the new science both hold forth a promise of 'mastery of nature' or, to use modern jargon, 'technological pay-off'. (Greek science did not promise the same.) And who would deny that science has fulfilled this promise far better than magic? This, *we* say, is because magic was largely based on *false* beliefs about nature and therefore represents an inferior form of rationality to ours. But this is not an entirely fair verdict. Because the 'beliefs' *we* entertain simply cannot be compared with those of the magicians.

5

The birth of the new science, the 'scientific revolution' of the sixteenth and seventeenth centuries, is one of the greatest wonders in the spiritual history of mankind. The spectacle is marvellous also in its colourful mixture of sources of influence: the revival of the Ancient, the survival of magic, the breakthrough of the Modern. Kepler, more than anybody else, is an embodiment of this mixture. But also with the author of the *Principia*, the crowning achievement

of the 'new philosophy', we recognize the same ideological ingredients although more distinctly separated than with the author of the *Mysterium Cosmographicum*. Newton has indeed been called the Last of the Great Magi; but he preferred not to hand over his vast amount of speculative writings to the printing press.

The revival and final breakthrough of heliocentric astronomy, the great advances in mathematics, and the acquisition of an entirely new conceptual framework for mechanics were the three major contributions of the era to the body of scientific knowledge and the creation of a new world-picture. Here we are not immediately concerned with *it* but with its underlying methodology or 'image of a science'. The articulation of this image is the merit, above all, of three men, viz. Francis Bacon, Galileo Galilei, and René Descartes. I shall here distinguish three principal traits of this image:

The first is the new view of the man-nature relationship, in fact a new conception of nature. Nature is *object*, man is *subject* and *agent*. Man faces nature as ('detached') observer, but also as manipulator. The strict objectification or, as it is also called, reification of nature entails a sharp separation of fact and value, of description and prescription. Values belong in the realm of the subject—they cannot be 'extracted' from a study of natural phenomena; the laws of nature may be 'iron' and 'inexorable'—but they give no guidance for the good or right life.

Another significant feature of the new science has to do with the relation of a whole to its parts. Material bodies and natural processes can be 'analysed' into component parts, from the properties of which one can then 'synthetize' the properties of the whole. Galileo describes this beautifully as his *metodo resolutivo* and *metodo compositivo*. The 'parallelogram of forces' is the prototype example of 'resolution and composition'. Totalities or wholes which are amenable to this method for explaining their properties and efficacies are also called *meristic*. Such a 'meristic methodology' is profoundly characteristic, not only of classical physics but also of every science modelled in its image, including classical associationist psychology.

The third feature I wanted to emphasize is *experiment*. The great theoretician of the experimental method, though not a great experimenter himself, was Francis Bacon. For Bacon, experiment was above all a systematic search for causes through the reproduction and suppression of which we can control their effects. It is thus expressive of a manipulative attitude in relation to nature. This attitude was foreign to Greek science, but highly typical of medieval magic. The experimentalist spirit can therefore be regarded as a legacy of Arab culture to Western science.

6

The element of *Zweckrationalität* inherent in magic was thus also present in the form of rationality which the new science represented. Right from the outset this was connected with expectations of technological pay-off. The technological ethos of modern science has never been so eloquently proclaimed as by Bacon. The first theoretician of the experimental method also deserves the title of Master Philosopher of Technology.

This technological aspect of scientific rationality has a natural link with the Judaeo-Christian view of man's place in the world God had created. In the first chapter of the Book of Genesis it is said that God created man in his own image and gave him domination over the beasts of the land, the fish of the sea, and the fowl of the air, and over all the earth. The new science of nature could be seen as a divine gift to man to help him exercise the domination entrusted to him by God himself.

It is instructive to compare the Christian justification of man's 'mastery of nature' with the myth of the Greek hero of technical rationality, Prometheus. The Titan stole the fire from the gods and gave it to mankind and taught man to use this gift for his arts or *technai*. But the gift of Prometheus was a theft—and thus the benefit which mankind drew from it had an illicit foundation. The 'Promethean spirit' when animating humans is akin to *hubris*. It induces men to exceed the *metron* or measure for what befits the right way of life. *Hubris* means the upsetting of a natural balance or harmony which is then restored in inexorable divine *nemesis*. The myth of Prometheus has through the ages challenged Western poets to gainsay and protest against unjust gods—but also to contemplate the limits of man's power to discipline the forces 'let loose' by his arts. Its wisdom presents a challenge also to us moderns who share neither the Greek feeling for the natural nor the Christian submissiveness to the divine.

It is understandable, however, that the Church as guardian of the Christian tradition and values was apprehensive of the revolution in ways of thinking and world-view brought about by nascent science. The infamous proceedings against Galileo epitomize in the enlightened opinion the retrograde character of the teachings of the Church in an era of recessive antiquity and progressive modernity.

And yet it seems right to contend that the ultimate triumph of the new science came about, not in spite of the resistance of the church, but in alliance with the forces of Christian religion, Catholic as well as Protestant. This has little, if anything, to do with the

Christian attitude to technology, but much with the Christian attitude to magic which in the transitional centuries between the Middle Ages and modern times played a bewildering rôle in the spiritual life of Europe. Mechanistic science rested on an objectified, 'de-spiritualized', view of nature which stood in sharp contrast to the magicians' idea of a nature populated by ghost-like forces which sorcerers and witches could command. The new science therefore was a welcome ally in fighting heresies and exorcizing the inferior ghosts, leaving the one superghost, the Christian Trinitarian God, sovereign ruler of the universe.

But, as so often happens, there was from the beginning a latent tension between the allied parties. Were Christian faith and values at bottom compatible with the evolved form of rationality which science represented? I think myself that there is an 'incommensurability' between the two which is often mistakenly regarded as an incompatibility. However, science, or better: scientific rationality, has surely been a contributive force to the secularization of Western society and therewith to the gradual erosion, the withering away of the influence of religion. The last great battle between science and religion—faintly reminiscent of the Renaissance battle between 'i due sistemi del mondo'—was the battle over Darwinism. The aftermath to it which we are witnessing today ('creationism') can hardly be taken seriously.

A more serious problem for us today than the crumbling of Christian faith is the *value vacuum* which has followed in the wake of the secularization of modern society. To its creation, too, scientific rationality has no doubt contributed. In a culture dominated by scientific rationality and its technological achievements, other forms of the spiritual life of man tend to atrophy and be rated as inferior. 'When God is dead everything is permitted.' What can show that this is not so? Certainly not science.

7

The technical pay-off of nascent mechanical science was soon noticeable, although to begin with hardly very spectacular. However, neither Bacon nor, to the best of my knowledge, any other early prophet of the technological blessings of the new science envisaged that these developments would in the end have a profound impact also on ways of life and on the entire social fabric. When this impact began to be felt around the end of the eighteenth century and the beginning of the nineteenth, this did *not* happen as a

consequence of spectacular new developments in contemporary science. Neither the invention of the mechanical loom nor that of the steam engine resulted from 'research and development' in anything remotely similar to the modern meaning of the term. (It has been said, and probably rightly so, that science owes more to James Watt than Watt himself owed to science.) Yet it is an undeniable fact that it was the scientific revolution of the late Renaissance and Baroque period which ultimately triggered the industrial revolution approximately two centuries later.

The industrial revolution was basically a change in the *mode of production* of commodities. The social change consequent upon this was a transition from agrarian to industrial society. This presumably is the greatest single change in the life of men and their societies which has occurred since the transition to the agrarian form of life thousands of years ago.

8

When discussing the Industrial Revolution and the problems to which it has given rise, one must never forget how *recent* and still unaccomplished the phenomenon is. It started in England not more than 200 years ago. The transformation of society from predominantly agrarian to predominantly industrial is in many European countries a change within living memory. In most countries the process has barely started and we do not yet know whether it will in the end embrace the entire globe. Presumably it will—even though pockets of 'agrarian backwardness' may remain in remote places just as 'primitive' tribes of hunters and gatherers continued their lives untouched by the agrarian revolution.

It is not in the least surprising that the transition to the industrial mode of production should be connected with grave problems of adaptation. In its early days, industrialization threatened a class of people, the workers, with a modern form of slavery. This prospect, vividly depicted by Marx and Engels, is, I think, no longer present, at least not in Europe—thanks to the adjustive counterforce of organized labour. But there is another 'slave revolt' in the offing. Nature, conquered and enslaved, kicks back on its master, technological man. The erosion of land, the pollution of air and water, the threatening depletion of non-renewable natural resources—these are the environmental problems with which the industrial state has to cope. But they are not its only problems. There are others, equally or more serious, of a psychological and social na-

ture. The erosion of traditional values nourishes a sentiment of the 'meaninglessness' of life and, in the 'ordinary citizen', also of alienation and powerlessness in relation to the impersonal bureaucratic machinery which controls and regulates our daily routine.

In view of these evils and threats to the well-being of man, one may ask whether the lifestyle promoted by science-based technology in combination with the industrial mode of production is *biologically* suitable for man. Einstein once expressed the same concern: 'Die Tragik des modernen Menschen liegt—allgemein gesehen—darin: er hat für sich selber Daseinsbedingungen geschaffen, denen er auf Grund seiner phylogenetischen Entwicklung nicht gewachsen ist.'[1] (The tragedy of modern man lies—generally speaking—in this: he has created living conditions for himself for which, because of his phylogenetic development, he is not adequate.) Is this tragedy destined for permanence? If so, the end can hardly be anything else than the self-destruction of the human species—whether all at once in a nuclear holocaust or after centuries of disintegration and disorder more like the 'heat-death' which physicists imagine is the ultimate fate of the whole universe.

I think it is good to be conscious of the realism of these apocalyptic prospects. Animal species originate and pass away—surely *homo sapiens* will not be an exception to this 'law of nature'. The words of the Psalm, teach us to number our days, that we may apply our hearts unto wisdom, have a meaning not only for the individual but also for mankind as a whole.

Speculating about the prospects of survival, however, is not very rewarding. It is of more interest to consider the repercussions which industrialization and further technical developments may have on institutions and forms of social organization. It is worth asking, for example, whether democratic government and individual liberties will survive the transformation of lifestyle. The ideals of democracy and freedom which have evolved in Western civilization rest on two presuppositions. One is that the average citizen can form his own opinion on public issues relating to his own long term interests. The second is that he can survey the consequences of his actions and commitments well enough to take full responsibility for the uses he makes of his freedoms. It is questionable whether these presuppositions can be satisfied in a society in which decisions become increasingly dependent on the opinions of experts and in which the effects of individual action

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[1] A. Einstein, *Über den Frieden. Weltordnung oder Weltuntergang*, ed. O. Nathan and H. Norden, Bern, 1975, p. 494.

upon society at large become increasingly hard to perceive and difficult to predict. The complexities in industrial society may be such that democratic participation in government deteriorates into an empty formality of nodding assent or voicing a protest to incomprehensible alternatives, and that individual freedom is either restricted to conformism with the inevitable or takes the form of irresponsible, nihilistic actions of self-assertion.

Also worthy of attention is the fact that sophisticated technology greatly enhances the possibilities for ruling élites to control the doings and manipulate the opinions of those over whom they exercise power. This, too, runs contrary to real democracy and freedom. I do not think, however, that the industrialization of society will favour personal dictatorships of the 'atavistic', retrograde type in the Western world such as those we witnessed in Europe between the two World Wars. The danger is rather something which I would call the 'dictatorship of circumstances', the autonomous impersonal forces of rapid technological developments and the self-perpetuating necessity of economic growth and expansionism. It is the imminence of this dictatorship which makes us ask whether the form of rationality represented by science and technology has not had repercussions on life which are far from reasonable.

I shall presently add some comments to this theme, but first let us once again return to developments in science.

9

At an early stage of its development the new physics already challenged Cartesian ideals of intelligibility. One such challenge was the notion of 'action at a distance' in Newton's theory of gravitation. It continued to cause conceptual discomfort almost until the advent of the relativity theory. Another difficulty was caused by the rivalry between the corpuscular and the undulatory theories of light. When the second eventually became established, it satisfied Cartesian demands only as long as the light waves were thought to be propagated in the hypothetical medium called the ether. With the abandonment of the ether hypothesis, the intelligibility of the conceptual framework of physics was again in the danger zone. The era of what has since been known as 'classical' physics was coming to an end and the threshold of something essentially new had been reached. The transition is marked by two of the greatest achievements in the history of science: the origins of relativity and quantum physics.

It is probably right to say that physical theory has not yet fully recovered from the shock presented in particular by quantum theory to old patterns of intelligibility. For example, the so-called Copenhagen Interpretation, which still seems to be favoured by the majority of theoretical physicists, is in substance an acknowledgement of the fact that a self-consistent and complete theory of the microworld which satisfies the requirements of classical physics simply cannot be provided. Instead one has to work with complementary but mutually exclusive conceptual schemas such as the particle-wave dualism of microbodies. The Heisenberg uncertainty principle again seems to shatter another core idea of classical physics, viz. the strictly reified conception of nature and separability of the observer from the observed.

As is well attested, Einstein himself refused to abandon hope that the classical ideals of intelligibility could be vindicated. Various efforts, partly in his footsteps, have been made over the years to 'reconcile' the complementary aspects of the interpretation of micro-phenomena to a better unified whole—but none of them seems to have gained wide acceptance. Later developments have further confused rather than clarified the situation. Perhaps the most spectacular puzzle, from a conceptual point of view, is connected with the famous experiment of thought, sometimes referred to as a 'paradox', of Einstein-Podolsky-Rosen and its actualization in the debate stirred by the Bell Inequalities. It poses a difficulty for the understanding somewhat reminiscent of the discomforts once caused by Newtonian action at a distance. Changes experimentally induced in the state of some entities seem to effect instantaneous changes in other entities locally separated from the first though belonging to the same 'system'. This presents a challenge to the meristic postulate of Cartesian intelligibility and it has been suggested that the challenge can only be met by a holistic conception of what David Bohm calls an 'unbroken wholeness' irreconcilable with the classical idea of decomposition of totalities into independent units from the efficacies of which the order of the whole can be recomposed.

It is obvious that most theoretical physicists are puzzled by the present conceptual situation in their subject. Few, however, indulge in speculations about the ultimate consequences of the breakdown of the conceptual patterns of classical physics. Serious philosophers of science also appear reluctant to let themselves into the maze. But it is striking that an increasing number of imaginative minds, including some with qualified scientific training, see affinities between, on the one hand, an emergent holistic methodology of

science and the abandonment of the subject-object separation of the 'classical' reified concept of nature and, on the other hand, the wisdom embodied in the mythologies of ancient religions and the teaching of mystics about nature, consciousness, and a non-deterministic and non-mechanistic interlocking of the links in the Great Chain of Being.

10

Perhaps the persistence, since the 1920's and 1930's, of a 'foundation crisis' in the science of nature is connected with the fact that, whereas theory seems crippled, experimental physics and its technological applications have flourished as never before in the second half of the century. A whole new world of subatomic phenomena has been disclosed and continues to be explored. It is less likely that this penetration into the subatomic will eventually give us the 'ultimate constituents' of matter than that it will give us ever new insights into the microstructures as long as the enormous expenditure required for research is thought justified by the resulting technological pay-off. It is worth quoting here what René Thom recently wrote: 'la description du réel . . . jusqu'au plus fin détail perceptible, est . . . sans autre limite que celles que fixe la société par ses allocations budgétaires. Cet état de choses n'est pas sans répercussions graves: les scientifiques, pour justifier leurs demandes financières, sont amenés à promettre à la société . . . de plus en plus d'avantages immédiats ou à venir. Pour entraîner l'adhésion collective, ils sont amenés à se solidariser avec les tendances les plus inquiétantes, voire les plus suicidaires de l'humanité.' (The description of the real world in the finest perceptible detail is limited only by society with its budgetary allocations. This state of affairs is not without serious repercussions. Scientists, to justify their financial demands, are led to promise society more and more benefits, immediately or in the future. To achieve collective adhesion, they are led to join forces with the most disturbing, indeed the most suicidal, tendencies of mankind.)[2]

It is also tempting to see a connection between the *Grundlagenkrisis* in physics and the fact that the biggest push forward in science in our century has been in the life sciences. The centre of gravity of the scientific world-picture, it is sometimes said, has shifted from physics to biology. But one should rather say that it has shifted to

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[2] 'Imbecillité et délire', *Le Monde*, 2 July 1984.

the borderland between the two; or speak about an 'invasion' into the life sciences from 'below', from what used to be the sciences of non-living nature. Terms of relatively recent origin such as 'biophysics', 'biochemistry', or 'molecular biology' are more telling than lengthy explanations. Greatest of all the novelties has been the study of the hereditary mechanisms of the species, starting with the rediscovery of Mendelian principles and the discovery of mutations at the very turn of the century, and culminating in the unravelling of the molecular basis of the chromosomes, the double helix of DNA, shortly after the middle of the century.

The technological pay-off of these developments has also been spectacular. Medicine, traditionally concerned with the curing of disease, is becoming increasingly involved in the manipulation of the hereditary basis of life. As is well known, this raises serious issues of medical ethics, and of the ethics of science in general.

The progress of biological science in our century has been a triumph for that image of science and type of scientific rationality which took shape with Bacon, Descartes, and Galileo. Echoing Descartes, the great pioneer of scientific physiology, Claude Bernard long ago spoke of the living organism as 'une machine qui fonctionne nécessairement en vertu des propriétés physico-chémiques de ses éléments constituants' (a machine which necessarily works by virtue of the physico-chemical properties of its constituent parts).[3] This, in a nutshell, expresses the meristic view of life phenomena in the perspective of a reified conception of nature. What was still for Bernard a programme, one hundred years later looks like a breakthrough and the ultimate victory of Cartesian rationality in the scientific study of life.

11

Will developments in biological science, too, terminate in a foundation crisis? The question is worthy of consideration.

The mainstream of progress to which I briefly alluded has been in what might be called, with an extended use of the term, 'microbiology'. (By this I mean an approach to the study of life phenomena from the microlevel.) I see no reason for thinking that this particular approach is heading towards a 'crisis'. But the situation may be different in what I propose to call 'macrobiology'. By it I

[3] In his classic work, *L'introduction à l'étude de médecine expérimentale*, Paris, 1865, p. 161.

understand, roughly, the integrative activity of the genes, the development of the egg to a united and diversified whole, the mechanisms of regeneration of a wounded organism, and the interaction of the organism with its environment. Without wishing to belittle obvious progress also in this area, the conceptual situation in macrobiology is certainly very different from that in 'microbiology'. One can note expressions of concern for this by leading contemporary biologists. Even such a staunch protagonist of the physicochemical approach to life phenomena as Jacques Monod admits that 'les problèmes . . . de la mécanique du développement posent encore à la biologie de profondes énigmes. Car si l'embryologie a fourni d'admirables descriptions du développement, on est loin encore de savoir analyser l'ontogénèse des structures macroscopiques en termes d'interactions microscopiques.' (The problems of the mechanism of development raise profound enigmas for biology. For, if embryology has furnished some admirable descriptions of development, we are still a long way from being able to analyse the ontogenesis of macroscopic structures in terms of microscopic interaction.)[4]

Maybe further advance of research on the microlevel will gradually also solve some of the open problems of the macrolevel. Leading biologists view the prospects here with varying degrees of optimism. But there seems to exist wide agreement that after the breakthrough achieved in the mid-century the problem-situation has changed. The question is, to quote Sydney Brenner, 'whether the problems of developmental biology could be solved by one insight like the double helix'. Whatever the answer, one could say, quoting the same source, that 'all the genetic and molecular biological work of the last sixty years could be considered as a long interlude' and that now 'we have come full circle—back to the problems left behind unsolved'.[5] It is obvious to an outside observer that there is a groping for various 'holistic methodologies' going on in the biological and also in the environmental sciences. 'Systems theory' is one of the tools to which great hopes are attached. Its usefulness and value is still unproven, it seems to me. But it is interesting to note the similarity of trends in microphysics, on the one hand, and in macrobiology on the other, towards new ideals of scientific intelligibility. It is natural that such trends which concern

[4] J. Monod, *Le hasard et la nécessité. Essai sur la philosophie naturelle de la biologie moderne*, Paris, 1970, p. 111.

[5] From a recorded conversation with Francis Crick and Sydney Brenner in H.F. Judson, *The Eighth Day of Creation: The Makers of the Revolution in Biology*, London, 1979, p. 209.

the conceptual apparatus, the 'way of thinking', rather than the investigation of facts, should be slowmoving—and also that they should be heralded by visionaries and prophets whose stammerings may be worth listening to although we cannot yet endorse them as true.

Would such a holistic world-view, if it were to emerge, represent a new form of scientific rationality? Perhaps in the sense that it would have a less close tie to the goal-directed, managerial rationality of control and prediction. Its technical pay-off would presumably be smaller than that of science in the spirit of Bacon and Descartes. But it may instead encourage a shift in the view of the man-nature relationship from an idea of *domination* to one of *co-evolution*—and this may be to the advantage of the adaptation of industrial society to the biological conditions of its survival.

12

An alliance with Christian ideology helped the new science to establish itself. But science also contributed to the gradual erosion of religion. Secularized national states became dominant powers. It was soon obvious that they too had a vested interest in the promotion of science, not for fighting heresies, but for enhancing the well-being of the population and the power of the state.

It is remarkable, however, that it took a relatively long time before science became firmly integrated into the social fabric of the new type of society to which the Industrial Revolution gave birth. Perhaps the fact that the inventions which set the industrial wheel in motion were relatively unsophisticated even from the standpoint of the science of their day contributed to the view, long prevailing, of science as an élitist preoccupation and luxury rather than as a major 'productive force' in economic and social developments.

The great change in attitude of state power to science came only in the second half of the century. The Second World War paved the way for it. Advanced scientific technology and also developments in pure science rendered services of decisive importance to the war machine—culminating in the atomic bomb. It is a doubtful glory which science earned for itself by virtue of the fact that many of its most prominent representatives were engaged in an enterprise which subsequently has resulted in a mortal threat to the entire human race.

In the short run, certainly, science has greatly profited from its acknowledged importance to the material basis of life in industrialized

national states. Financial support for science is now in most countries of quite a different magnitude from before the war, and the number of people engaged in research and scientific training has increased enormously. Welcome as these developments may be to the scientists, there is also a danger connected with them. Science runs the risk of becoming a hostage of state and industrial power.

The state is not, as the Church once was, an authority whose claims to know the truth science might challenge. The secularized state in the West simply makes no such claims. The obedience of the scientific community to national interests is secured, not by the Inquisition, but by the Treasury. Science needs money, and big science big money, and this has to come mainly from sources the primary interest of which is not the search for truth for truth's sake but an expectation of return on invested capital. 'Science policy' is a novel concept in the state household. The expert advice needed for it is provided by the scientific community, but the goals are set and the decisions taken by others. This means that scientific research is directed to goals external to science itself. The goals are, on the whole, only vaguely defined in terms of national security and the well-being of the citizens. The very vagueness of the goals is apt to camouflage the ways in which science becomes adjusted to them. However, the greater promise of pay-off, in the form of marketable commodities or public utilities, a research project can offer, the better chances does it have to get a substantial share of the financial cake. And since the technological pay-off of science in the tradition of Cartesian-Baconian rationality is much more sure than research guided by holistic methodologies and a co-evolutionary view of the man–nature relationship, it follows that incomparably more effort and money will be invested in the former than in the latter type of research—perhaps to the detriment of the autonomous development of science itself.

13

Hardly a day passes now when one cannot read in the papers the fresh pronouncement of some statesman, industrial leader, or even scientist emphasizing the necessity for the nation to keep abreast with scientific and technological developments. The benefits of leading the race and the disasters of lagging behind are painted in vivid colours. What then are these benefits and disasters?

The first are vaguely referred to as improved standard of living or material well-being. But in countries like those of the West, in

which the material standard has since long surpassed any level needed for comfortable living and freedom from the hard necessities of incessant toil for the daily bread, this argument has with time become so hollow that it may well be doubted whether any intelligent person can still take it seriously. It is true that there are problems, even grave ones, relating to the well-being of the population in industrial societies. But these problems are not due to insufficiencies in the use of high technology for the production and marketing of commodities. They are rather the *embarras de richesse* of a new lifestyle.

It is easier to understand and take seriously the threats consequent upon a backlash. In the integrated network of commercial and industrial relationships, weak competitive power and low productivity automatically lead to a weakening of the nation's ability to assert itself on the political level. In relations between partners of very unequal strength this may constitute a threat to national independence and security.

It has long been obvious that the material resources of small or even medium-size nations are insufficient to maintain pure research at the highest level in the experimental sciences. Joint ventures based on co-operation between nations have become necessary. The earliest and probably best example in Europe is CERN. But it and similar measures in European research policy have not been able to prevent a brain drain over the years to the power in the West which not only is strongest in material wealth but also enjoys the advantage over its European partners of being *one* national state. Even more than in pure research, this advantage has shown itself in industrial research and development: in the creation of giant laboratories or the building up of concentrated areas of technological inventiveness such as the famous Santa Clara Valley.

The prospect of industrial backlash due to insufficient concentration and co-ordination of innovative resources alarms the political and industrial leaders of Europe. There is an awakening awareness that the threats to national independence and self-assertion consequent upon decline can be met only by joint inter-European efforts at a scientific and technological revitalization of our continent.

There can be little doubt that the idea is thoroughly realistic in the sense that an enhancement of the industrial and technological capabilities of Europe will also enhance the possibility of Europe asserting itself both as a competing and as a balancing force between the power control of the West and of the East.

The realism of these aspirations and hopes granted, the following question remains open for reflection: Will the industrial revitaliza-

tion of Europe facilitate the adaptation of men to the lifestyle of industrial society or will it, on the contrary, aggravate the symptoms of discontent and maladjustment?

14

My view of this question is pessimistic. I simply see *no* reason for thinking that further industrial developments will help society to overcome its internal grievances. But I can see several reasons for thinking that the evils will get worse. One could condense these reasons into a single word, *inertia*. More specifically: the inertia of the wheel of technology kept in motion by science. This is also spoken of as the 'technological imperative'. It is of course not the only force moulding societal developments in industrial countries—but I think it is the most deepseated (relatively autonomous) and strongest one. Therefore the self-perpetuating push forward with which technological progress feeds the industrial mode of production, in combination with the threats to the national interests consequent upon backlash, holds society in an iron grip from which there is no escape in sight. An attempt would be a leap into uncertainties and risks which no responsible leadership can possibly afford. The technological 'arms race' must continue.

The competitiveness of the race and the rigidity of its directedness will for the time being make it increasingly difficult to cope adequately with the environmental and social problems engendered by the changed lifestyle. I doubt whether even the prospect of a complete deforestation of Central Europe, or any other ecological disaster which is now in the offing, could stop or even appreciably modify the industrial processes of which it is a side-effect. Threats caused by industries are likely to be met by counter-technologies rather than by changes in production; shortage of natural resources again by the manufacture of new artificial materials and by further release of the energies of the atom. The threats to security arising from criminality, sabotage, and terrorism will be countered by a tighter control and surveillance of the individual and by more efficient use of the coercive powers of the state.

A problem confronting industrial society—perhaps even more serious than the problems relating to environment and resources—has to do with labour. I am not now thinking primarily of the problems of unemployment in the traditional sense. What I have in mind are the long-term consequences of the automation and robotization of work which electronic technology—the technology of the

computer and the microprocessor—will have. We are on the threshold of a new era in the industrial revolution. The amount of work actually performed by humans will—even assuming a steady increase in productivity—in all probability drastically decrease. If this is not to result in mass unemployment, it requires a profound reorganization of labour. It is difficult to imagine how this could happen in Western societies where labour relations on the whole are based on contractual agreements between employers and employed. The change seems to require drastic state interference for the protection of the rights of individuals to a fair share in the supply of labour opportunities and in the means of maintaining a satisfactory standard of living. But there is also another aspect to be considered.

Shortening the necessary time for work means a corresponding growth of so-called free time. How will it be used? In some cases undoubtedly for creative activity, the cultivation of hobbies, and the study of edifying subjects. In other cases it will no doubt deepen the feeling of estrangement and the aimlessness of life, particularly for those whose chief enjoyment lies in consumer goods produced in increasing abundance by an expanding industry. Will not these latter be the great, great majority? In the materialist atmosphere of contemporary consumer society it is difficult to see how it could be otherwise. But this alienation of man in industrial society, first from nature and then from labour, also breeds dissatisfaction with the existing order of things, desperate outbreaks of revolt, and cries for new objects of worship. In these sentiments, already all too noticeable, I see the greatest dangers to the cohesion of our societies and to traditional Western forms of government.

15

My vision of the future of technological and industrial society is admittedly not very bright. But even if one does not believe that these are the prospects, one cannot deny the dangers. It is unworthy of rational man to let himself be lulled into unconcern for the future. The possibility of complete annihilation, too, must be faced with courage and dignity. Moreover, awareness of the dangers is a precondition of being able to cope with them. Such awareness exists today and is increasing. It exists at a popular level in the form of various 'movements' protesting at the direction of developments and groping for a new lifestyle and values which will legitimize it. It exists in more articulate forms in the growing

consciousness of scientists of their co-responsibility for the uses of scientific knowledge. And it exists, finally, in the form of tendencies within science itself towards a changed image of the scientific enterprise and towards new types of understanding which are, not less rational, but maybe more reasonable from the point of view of what is good for man.

XI

DANTE BETWEEN ULYSSES AND FAUST

1

One of the most moving and also most enigmatic passages in the Divine Comedy is Dante's encounter with Ulysses. It is described in the twentysixth *Canto* of the *Inferno*. We are now in the region called *Malebolge*, deep down on the ladder of sin where treacherous councellors suffer eternal punishment. The place is full of flames and in each flame a human being is enclosed. Dante is struck by one flame which is cloven at the top and asks his guide Virgil, who is burning in it. Virgil answers that it is Ulysses together with his companion in the war against Troy, Diomedes. They suffer, we are told, for the stratagem with the wooden horse which deceived the Trojans and brought about the fall of the city.

Dante in great excitement asks permission to speak to the flame. Virgil does not grant him his request, although he thinks it laudable—'degna di molta loda'—and agrees to address the approaching flame himself. Virgil now asks Ulysses to tell him where he went to die. Ulysses from inside the flame tells his interlocutors the following story:

After he had left Circe, who held him captive for more than a year, neither affection for his son, nor veneration for his old father, nor love for his faithful Penelope could restrain his burning desire to get to know the world and every vice and valour of which man is capable ('divenir del mondo esperto, e degli vizi humani e del valore'). Thus he set out on another voyage with the few surviving companions from his previous travels. They sailed westwards passing through the strait of Gibraltar, where Hercules had placed his pillars as a sign that man should proceed no farther ('acciò che l'uom più oltre non si metta'). Neglecting the prohibition Ulysses urged his men to follow him to explore a world where no human being had as yet put his foot. 'Consider', he exclaimed, 'that you are not destined to live like brutes, but to aspire after virtue and knowledge' ('Fatti non foste a viver come bruti, Ma per seguir virtute e conoscenza'). And so they continued across the waters,

making their oars wings on a flight which no-one had dared to undertake before them. Finally, after months of travel, they sighted a coast with an enormous mountain. A wind blew up from the land, hit the ship, whirled it round three times, the vessel was sucked into the depths—'and over us the booming billows clos'd'. Thus perished the horror-stricken Ulysses and his crew. Here the tale ends; upright and with dignity the flame then moves away from its stupefied audience.

This version of how Ulysses ended is not known from elsewhere and may well be Dante's invention. The cliff which Ulysses approached before his shipwreck could have been the mountain of Purgatory; the description of its location fits Dante's conception of geography. If this was so, interpreters may ponder over the symbolic significance of its inaccessibility for the pagan adventurer. I shall not develop *this* theme here.

2

Dante was obviously shaken by the tale Ulysses had told him. In the Homeric adventurer he must have recognized if not himself, at least a kindred soul. Dante was also in search of a world which no living man had visited before. Like Ulysses he was curious about the things he witnessed. The questions he constantly puts to his companion testifies to this. Therefore he was, so to speak, 'doubly curious' about Ulysses whose curiosity had led him to disaster.

What is new with Dante's conception of Ulysses is, in the first place, that he adds a new dimension to the Homeric hero's guilt. Traditionally, Ulysses was censured for cunningness and treacherous behaviour. In the Latin tradition in particular, he was an evildoer as he had brought about the fall of Troy. We should remember that the leading survivor among the Trojans, Aeneas, was regarded as a sort of 'protofounder' of Rome, the city which was destined to become the acknowledged capital of Western Christendom. That the author of the Aeneid should think Ulysses deserving of eternal punishment is not in the least surprising. The author of the *Commedia* does not, at least not in words, question the grounds of the verdict as presented to him by his guide through *Inferno*. But whether or not Dante thought these grounds sufficient, he placed the unhappy sufferer in the fires of Hell in a new perspective by adding to his load of guilt unlimited curiosity, unrestrained pursuit of knowledge for its own sake, as an end in itself.

With this change of perspective Dante in fact transformed the

Homeric figure completely and gave him a symbolic significance which he did not possess in the Greek tradition but which has since been prominent in Western poetry and thinking. This by itself is a major achievement of Dante's. As one commentary on the Ulyssean tradition observes,[1] Dante turned Ulysses, the centripetal, homeward bound traveller who finally settles down in peace after a life full of restless search, into a centrifugal adventurer who never comes to rest but constantly moves on in search of the new and as yet untried. He is a spiritual kinsman of two other illfated fictional seafarers, the Flying Dutchman and Captain Ahab in Melville's immortal novel. In Tennyson's words a 'gray spirit yearning in desire/to follow knowledge like a sinking star/beyond the utmost bound of human thought'.

I am by no means the first to note that Dante, by making Ulysses a symbol of man's unquenchable thirst for knowledge, was in fact heralding the great changes in the spiritual climate of Europe which were to take place in the fourteenth and fifteenth centuries. 'Ulysses' voice', it has been said, '—as Dante gives it life speaks prophetically for the spirit of the Renaissance'.[2]

Not too long after Dante wrote, his Ulysses transformed found an incarnation in flesh and blood in a figure who was then himself going to be transformed into a symbol maybe even more congenial than the Greek hero to the spirit of our Western Civilization. This incarnation was an infamous German, Doctor Johann Faust, who lived in the turbulent early decades of the Reformation. Dante's centrifugal Ulysses is an anticipation of Faust—not so much of the man as of the symbol.

3

The idea that it is not befitting for man to know every truth and that unrestricted pursuit of knowledge may be sinful is deeply ingrained in our Judeo-Christian religious tradition. Its earliest expression is the myth of the Tree of Knowledge with its Forbidden Fruit in the first book of the Bible. In the Christian moral teaching of the Middle Ages *curiositas* is deemed a sinful disposition. Saint Augustine prays that God save us from it, and Saint Thomas too condemns it.

The idea that there are truths beyond human grasp which man

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[1] W.B. Stanford and J.V. Luce, *The Quest for Ulysses*, Phaidon Press, London, 1974, p. 189.
[2] Ibid.

should not aspire to get to know is related to certain ideas about authority and revelation. One could speak about the Authority of the (Revealed) Word—an idea which in its turn has its roots in an archaic view of the relation between language and reality. Words have a natural meaning. To understand this meaning is to possess the truth. Such understanding, however, is not given to common men but is mediated by interpreters who are accepted as trustworthy by those who exercize the authority. In the orbit of Christian mediaeval culture this authority got its weight partly from the fact that it was ancient, handed down since times immemorial, but partly also from the fact that, if challenged, it could mobilize in its support the *worldly* power of the Church.

It was this view of authority in matters of knowledge and truth that was contested by awakening science during the Renaissance. Not agreement with the Word marked opinions as true, but agreement with the contingent facts of a Nature which lay open to inspection by the inquiring mind. The challenge did not concern only the authority of the Christian tradition but also that of the Ancient writers whom the *umanisti* of the time were busy reviving and trying to reconcile with their inherited creed.

The conflict between the old and the new view is epitomized in the encounter—as told to us—between Galileo and the university professors in Florence who refused to look in the telescope and see the revolving moons of Jupiter, on the ground that Aristotle had shown such bodies to be impossible, 'an authority whom not only the entire science of Antiquity but also the venerable Fathers of the Church acknowledge'.[3] This was three hundred years after Dante. The learned men who bowed to authority unwittingly ridiculed their own party in a conflict which had by then deteriorated into one between truth and naked power.

4

Even though Dante's centrifugal Ulysses can truly be said to herald a new spirit which eventually, after centuries of struggle, came to prevail in our Western World, it would be a great mistake, I think, to regard Dante himself as an early partisan of this spirit. Dante is firmly rooted in the culture of the Christian Middle Ages. His work, one feels tempted to say, is the consummation and crowning achievement of this culture. At a moment when the potentialities inherent in the seed had reached their climax and doubts and

[3] Quoted from Brecht, *Leben des Galilei*, pt. 4.

cleavage were already beginning to affect the plant, Dante's *Commedia* presented a vision of the supranatural realm which Christian spirituality has tried to fathom, more loaded with symbol, more beautiful and profound than any ever attempted either before or after.

No reader of the *Commedia* can fail to be impressed by the violence with which Dante condemns signs of corruption and decay in the Church and his wrath at the factionism which was ravaging the political life of practically every town in Italy. This factionism had made Dante himself an exile from his beloved Florence.

But as a critic of his times Dante is aiming at *restoration* not at *reformation*. This is true not least of his political thinking. It is essentially a plea for an order in which the Pope and the Emperor reflected two aspects of the same universal body political, a *Civitas Dei*. Dante is yearning for an ideal which was threatened with being lost; he is not looking forward to the new world which a reborn Ulysses might yet discover.

5

With the rise of science and the secularization of society it became part and parcel of intellectual morality that the search for knowledge and truth should not be curtailed by prohibitions. It became conventional to distinguish sharply between the pursuit and possession of knowledge on the one hand and its application and use on the other. Many philosophers proclaimed knowledge an intrinsic good and something worth pursuing as an end in itself. Therefore one who pursues and finds it cannot be held responsible for the doubtful or even evil use which others might make of his findings.

This moral position can be upheld as long as one is reasonably sure that bad use of acquired knowledge does not constitute a potential threat to the very basic conditions of human well-being or even to the self-preservation of the race, and as long as one retains a faith that enlightenment will also contribute to the moral progress of humanity, make men more 'humane'—as the revealing phrase goes.

This faith and assurance was for a long time characteristic of the ethos of Western civilization. It had a decisive breakthrough at the time of the French Revolution and it culminated in the century of European world-domination which ended with the 1914–1918 war. It was greatly reinforced by 19th-century evolutionistic ideas in nearly all fields of study and it nourished a widely spread optimistic belief in progress through science, technology, and the rational organization of human institutions.

This faith in the basically blissful, beneficial consequences of man's pursuit of knowledge no longer stands unchallenged, however. Doubts about it have come to loom heavily over cultural debate in this century. They found an expression, for example, in Edmund Husserl's last work, the posthumously published *Die Krisis der europäischen Wissenschaften.* It was written before the apocalyptic prospects conjured up by the nuclear arms-race, genetic technology, and large-scale automation and robotization of work had become reality for us. Today, half a century later, Husserl's concerns have assumed immediate urgency. It can no longer be taken for granted that 'those who lead us into new realms of scientific knowledge' are 'prudent and trustworthy guides conducting us to higher levels of civilization' and not 'false councellors, luring us on to atomic destruction'—to quote the words of W.B. Stanford[4] one of the leading writers on the Ulyssean theme.

The question whether the unrestricted pursuit of knowledge is more for good or for evil rests ultimately on value premisses the acceptance or rejection of which is not a matter of truth or falsehood. But it also seems obvious that the optimistic belief in progress through scientific enlightenment and technological innovation has very little rational foundation and should therefore rather be abandoned altogether. Nor have we the slightest reason to place our hopes in a return to a stage when the Authority of the Word will again reign supreme in matters relating to knowledge and truth. Such retrograde moves, though abortive, have not been unknown in our century. The possibility cannot be ruled out that they will be followed by others, more subtle and therefore more successful ones than those we witnessed in Hitler's Germany and Stalin's Russia. A culture may thrive under the Authority of the Word as long as there is a living belief in its divine inspiration or otherwise sacred nature. Such was the case in the Middle Ages. But when the Word is seen to express only the whims and wishes of worldly power, clinging to its authority has no rational justification and is a regress into barbarism and the irrational.

What befits us to do, instead, is to take a critical attitude to our own capabilities and doings. To this end we would be well advised to reconsider the wisdom embodied in the great works of reflection on the human condition of such teachers of mankind as Homer and Dante and Goethe.

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[4] W.B. Stanford, *The Ulysses Theme*, 2nd. ed., Basil Blackwell, Oxford, 1963, p. 182.

So let us cast a brief glance at what guidance *they* may be able to offer us.

6

The centrifugal Ulysses of Dante was condemned because he transgressed the limits set by divine authority on the freedom of human cognitive enterprise. There can be no doubt but that Faust, in Dante's opinion, would have been equally illfated, deserving to be the devil's booty, as indeed he was made to be in the first major work of literature dealing with the subject, Christopher Marlowe's drama 'Doctor Faustus'. Goethe's Faust is also a doubtful character and a reader may well wonder whether he deserved to be rescued and go to heaven after his anything but spotless earthly career had come to an end. At least one can reasonably doubt whether his unending striving and refusal to rest content with his achievement by themselves justified his redemption.

Be this as it may, Goethe's Faust *is* saved—and the same may be said of the centripetal hero of the Homeric epic. Not only Dante's ascent from *Inferno* through *Purgatorio* to *Paradiso* but also the narratives of the knight errants of Homer and Goethe are dramas of man's road to salvation. The Ulysses of the Odyssey came home to her who had been patiently awaiting his return all those years, never losing trust in the traveller's final return to a life of mutually shared love and happiness. Dante is kept safe on his wanderings through the abyss by the divine light of which he first saw a reflection in the love of his youth and which was eventually to take him, the restless exile from his home on earth, to eternal beatitude in heaven. And Faust in rescued from the clutches of the devil and lifted to heaven by the chorus of angels in which she whom he once loved but then deserted sings of *das Ewig-Weibliche* which lifts us above the inconstancies of fate to union with the higher.

7

It is striking that in all three cases the power which saves the wanderer from disaster is incarnate in a female figure: Penelope, Beatrice, Gretchen. We need not overemphasize, however, the femininity of this common element of the three tales. The three figures are first and foremost symbols. The same holds true of their male counterparts. Yet what they symbolize as couples, Penelope

and Ulysses, Beatrice and Dante, Gretchen and Faust, can naturally be related to those qualities which are traditionally held to be symbolic of womanhood and manhood—not only in Western culture. On the one side protective care, self-effacing love, and an intuitive sense of the boundaries which one can overstep only on peril of destruction. On the other side lust for dominating power and self-centered glory, untempered enterprize and an indomitable will to transcend set boundaries. The two are the Yin and the Yang of ancient Chinese wisdom.

Of our three heroes, Faust no doubt is the one who deviated most widely from the paths set to men by convention and rule. Unlike the other two, he is not striving for a goal. His enterprize has no *telos* external to itself. In Faust's perpetual push forward Spengler saw a symbol of the spirit which has animated Western Culture. He therefore called this culture of our *Abendland* 'Faustian'. How appropriate this name is, has become fully obvious only in our century when science-based technological developments in combination with the mechanized industrial mode of production has nourished a myth of perpetual economic growth and expansionism. The managerial type of rationality of which modern natural science is in origin the outflow has acquired a domination under which other forms of human spirituality—artistic, moral, religious—are either thwarted or relegated to the underground of irrational belief and uncontrolled emotion. In no other culture, surely, has Yang come to dominate as completely over Yin as in our own in its late days.

The cultures of which the other two heroes, Homer's Ulysses and Dante of the *Commedia*, are representatives, viz. the culture of Ancient Greece and that of the Christian Middle Ages, struck a happier balance between the two opposing forces. Greek mythology and philosophy emphasizes throughout the necessity for man to stay with the *metron* befitting his capabilities and not lapse into *hubris* which is then corrected by *nemesis*, the goddess-guardian of equilibrium in the *kosmos*. Christian religion and philosophy is inherently ambiguous on man's freedom in relation to the created natural order of things. But it paves a road to salvation for those who curb their selfish will and put their faith in God's superior wisdom and care for their well-being.

There is no way back for us moderns either to Ancient belief in a self-preserving cosmic harmony or to Dante's dream of the restoration of a universal Christian commonwealth. We must try to attain our *own* self-reflective understanding of our situation. And I have wanted to say that it belongs to this achievement that we take

warning of the fate which the poet foresaw for the non-Homeric Ulysses who steered his vessel beyond the pillars of Hercules and thereby entered the road to self-annihilation.

XII

THE MYTH OF PROGRESS

A Contribution to the Debate on Modernity

To Jürgen Habermas
Critic and champion of 'the modern project'

1

The debate in recent years about 'cultural values' has centered heavily round the idea of Modernity. In order to get a grasp of the debate, we must first try to make the idea itself at least moderately precise. By the Classically Modern I shall mean a climate of opinion which came to prevail in Europe in the 18th and early 19th centuries. It is associated in origin with the movement known as the Enlightenment—but also with its aftermath, Romanticism. Its impact consisted in a progressive emancipation or liberation of human powers from the bondage of authority and tradition, and in corresponding changes in the mores of men and in social and political forms of life. Two of its catchwords were freedom and reason.

Like most profound changes in ideas, the modernity of the Enlightenment was heralded in the works of the great thinkers of the epoch. Three stand out from the rest. They are Rousseau, Kant, and Hegel. Of them Kant seems to me the purest representative of the spirit here called classical modernity.[1] With his senior Rousseau and his junior Hegel we already see clouds arise which have come to cast shadows of doubt over a later time which some think is in fact the end of the entire epoch of modernity.

Kant's work culminates in his three great Critiques: those of

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[1] Kant's famous little paper '*Was ist Aufklärung?*' is accessible, together with comments on its question by Erhard, Hamann, Herder, Lessing, Mendelssohn, Riem, Schiller, and Wieland, in Reclam, Universal-Bibliothek, Nr. 9714. See also the essay by Jürgen Habermas on Foucault '*Mit dem Pfeil ins Herz der Gegenwart. Zu Foucaults Vorlesung über Kant's "Was ist Aufklärung?"*' in J. Habermas, *Die neue Unübersichtlichkeit*, Suhrkamp, Frankfurt 1985. Foucault's piece on Kant's question appeared in *Magazine Litteraire, Nr. 287, 1984.*

pure and practical reason and that which Kant calls 'judgement' (Urteilskraft). Simplifying matters a little, one can say that they deal with knowledge, morality, and art respectively. Or, alternatively, with Truth, Goodness, and Beauty. Their joint message amounts to a separation of the three notions or spheres from one another and an acknowledgement of their autonomy in relation to demands on them 'from outside', so to speak. Thus knowledge is emancipated from what may be called the Authority of the Word, meaning the authority of ancient authors and of the Holy Scripture. Morality, i.e. man as an autonomous agent or subject, is emancipated from forced obedience to the heteronomous imperatives of spiritual or worldly power. Art, finally, is liberated from the constraints of serving the purposes of either entertaining the public or glorifying the powerful. The Enlightenment, in Kant's often quoted words, meant 'der Ausgang des Menschen aus seiner selbstverschuldeten Unmündigkeit'[2] or, as he says in a shorter dictum of his: 'The Enlightenment is to follow the maxim always to think for oneself'.[3]

2

The maturation of the climate of opinion which I have called modernity in its classical form is a process going back in time far beyond the Enlightenment. Its beginnings are traditionally placed in the Renaissance. As far as the emancipation of knowledge is concerned, the origins of modernity may in fact be traced back to the groping beginnings of an exact science of nature in the late Middle Ages. This was a turbulent era of break-up of an old order and the tentative search for a new one. It is sometimes instructive to view our own troubles in that 'distant mirror'.[4]

The emancipation of man as moral agent (subject) was an even slower and more painful process than the emancipation of knowledge from the tutelage of received authority. In roots, too, reach back to the troubled centuries of the waning Middle Ages. Heresies sprang up throughout Western Christendom and resulted, at the time of the Reformation, in the final breach in the unity of the Western Church. With this rupture began the turn to worldliness that we call the 'secularization' of originally Christian beliefs and

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[2] 'Enlightenment is the exit of man from his self-imposed guardianship.'
[3] 'Die Maxime, jederzeit selbst zu denken, ist die Aufklärung.'
[4] 'Distant mirror'. After Barbara Tuchman's masterpiece *A Distant Mirror, the Calamitous 14 Century* (1978).

values. One of its early stages of development was the peculiar individual-centered form of economic enterprize known as capitalism. Later the process led to a gradual erosion of religious creeds and weakening of the influence of religion on education and ways of life.

Also in the arts one can trace a long history of 'emancipation'. It has been said[5] that the Middle Ages knew art only in its applied forms, serving purposes mostly of an overworldly, transcendental inspiration, ad majorem gloriam Dei. With the Renaissance begins a shift from the over-worldly to the inner-worldly, with purposes set in the frames of societies in a process of secularization. But it was only with the Romantic movement of the late Enlightenment that the idea was born of the artist as the creator of works of expressive self-realization to be appreciated solely on the basis of disinterested aesthetic evaluation. This was from the beginning a somewhat problematic conception of autonomy. Without it, however, the avant-garde and experimentalist spirit characteristic of eminently 'modern' art would not have come to prevail.

3

The great German sociologist Max Weber coined the term 'disenchantment' (*Entzauberung*) for the emancipation of European culture and forms of life from the spell of Christian beliefs and traditions and the term 'rationalization' for the progressively secularized forms of management of social and political affairs. It also seems to have been Weber who first characterized modernity in the terms of the autonomy of the three Kantian spheres of knowledge, morality, and art. This characterization is thus of a later date; when modernity had already lost its youthful appeal and assumed the face of thoughtful self-reflexion.

However, let us first dwell upon the beginnings. The face of young modernity looked hopefully towards the future. Before the eyes of awakening humanity opened bright prospects of a cosmopolitan world of free and equal men. The image of man of classical modernity was Shelley's 'Prometheus Unbound':

> 'The loathsome mask has fallen, the man remains
> Sceptreless, free, uncircumscribed, but man
> Equal, unclassed, tribeless, and nationless

[5] By J. Huizinga. His classic work on 'the waning of the middle ages', first published in English in 1924, contains a very perceptive analysis of the aesthetic sentiment in the middle ages.

Exempt from awe, worship, degree, the king
Over himself; just, gentle, wise—'

The most characteristic feature of this optimistic mood is belief in progress. Not just temporary progress or progress contingent upon the lasting good will of men, but progress unbounded and everlasting, progress as something 'natural' and necessary. This is a new conception in the history of ideas. I shall call it the Modern Myth of Progress. As the locus classicus of this idea one often designates a passage in an essay[6] by the French scientist Fontenelle from 1688. '*Men*', Fontenelle says there, '*will never degenerate, and there will be no end to the growth and development of human wisdom.*' What may be called the canonic script of this new creed, however, is about one hundred years younger. This is Condorcet's *Esquisse d'un tableau historique des progres de l'esprit humain*, written at the time of the French Revolution.[7]

For Condorcet progress is not confined to knowledge alone. It also means the moral perfection of man. On the political level it will further the equality of the citizens and eventually also the equality of all nations. The way to progress has no end in time, other than 'la durée du globe où la nature nous a jetés'.[8]

Condorcet did not for a moment doubt that 'toute découverte dans les sciences est un bienfait pour l'humanité'.[9] But at the same time, interestingly, he had an acute feeling of our responsibility for future generations.[10] We must not waste nature's resources through thoughtless multiplication of our own number, he warns. Condorcet was convinced, however, that this obligation to the not yet born will be fulfilled thanks to an enlightened grasp of our own true good.

Condorcet finished the *Esquisse* in hiding from the bloodhounds of the terreur. He died one day after he was caught by them; whether of exhaustion or because he was killed is uncertain. It is a sad irony of history that the man who so emphatically proclaimed and firmly believed in progress for emancipated humankind should himself be sacrificed on the altar of that Moloch who has since, in the name of reason, freedom and equality demanded an uncountable number of lives, from the terreur consequent upon the Great French to the Gulag following the Great Russian Revolution.

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[6] '*Digression sur les anciens et les modernes*'.

[7] Here quoted from *Les Classiques du Peuple*, Editions Sociales, Paris 1971.

[8] Op. cit., p. 77.

[9] Op. cit., p. 27. The quotation is from Condorcet's '*Discours de réception a l'Académie française*'.

[10] Op. cit., p. 269ff.

4

Condorcet's philosophy of progress had a distinguished followship throughout the 19th century. In France its protagonists were Comte and Taine and (the young) Renan, in England Mill and Buckle and Spencer, to mention only the most influential names of their time. In those two countries the current of thought which is most closely wedded to the idea of progress and characteristic of the spirit of modernity is known as positivism. The name is an invention of Comte's.

The case of Germany is a little different. Positivism never flourished in 19th century Germany. And here modernity and belief in progress found many of its early critics.

The great German philosopher of progress is Hegel. His views are alien to the spirit in which knowledge of the kind the English call 'science' has advanced since the time of the Enlightenment. Hegel's philosophy is highly speculative. One could superficially characterize it as a doctrine of the self-realization of freedom through stages of development of the human spirit (*Geist*): the subjective, the objective, and the absolute. As is well known, Hegel's spiritualism was 'inverted' by Marx and Engels to a professedly materialist philosophy about successive phases in the dialectic interplay of productive forces and productive relations. This development was supposed, by an inner logic, to take men and their societies from the realm of necessity to that of freedom. The philosophy of progress of (ultimately) Hegelian inspiration has continued a strong influence both on theory and on practice until late in our century. Now its potencies seem pretty much exhausted—at least for the time being.

5

Never before has Europe played such a domineering rôle in relation to the rest of the world as during the thirteen decades separating the two greatest revolutionary upheavals in its history. The 'proud tower'—to use Barbara Tuchman's happy phrase[11]—was erected in an optimistic belief in progress for all humankind through the diffusion and civilizing influence of European cultural, commercial, and religious values over the continents of Africa, America, Asia

[11] The phrase is borrowed from a poem by Edgar Allan Poe.

and Australia. This crusading enterprize ended in the conflagration of the First World War. But the bird which arose from the ashes continued its flight to the future in an essentially unchanged mood. The world was supposed to have been made 'safe for democracy'. The reactionary Habsburg Empire had fallen to pieces. And the Bolshevik Revolution in Russia had not only swept away the most obsolete remains of pre-Enlightenment Europe; it was also hailed—as once the revolution in France—by a generation of bewitched intellectuals in the West as a new and still brighter hope for the future of man under the banners of Reason and Freedom. The spirit of classical modernity was rejuvenated in the 'modernistic' movements which swept the world in the aftermath of the First World War. One could also refer to them with the name Neo-Modernity.

The 1920's were a truly remarkable decade. It saw the rebirth of positivist philosophy. This time it happened on German soil (*Kulturboden*), moreover. The neopositivist movement later spread westwards and eventually conquered and reigned supreme, under the name 'analytic philosophy', in the Anglo-American sphere of cultural influence nearly up to the present day. Hegelianism and its Marxist off-shoots again migrated East and became, under the name 'Marxism-Leninism', the official 'philosophy of progress' in the new type of society which emerged from the October Revolution.

Vienna, the birth-place of neopositivism, was also the cradle of psychoanalysis. In 'modernist' post-war Europe its fertilizing influence reached far beyond the confines of therapeutic medicine and psychological theorizing into art and literature. It also put in motion a 'liberalization' of moral attitudes which has continued through a number of successive generations.

The 20's were, moreover, the decade of the *Bauhaus*, of Charlie Chaplin's and Sergei Eisenstein's great movies, of Erwin Piscator's and Max Reinhardt's theatre, of Brecht's version of *The Beggar's Opera*, of modernist poetry, and new experiments in music and the plastic arts.[12] An interesting testimony to the spirit of neomodernity and the implicit alliance of the various modernist tendencies of post-First-World-War-Europe is the preface to one of the major works in the philosophy of the time. This is Rudolf Carnap's *Der logische Aufbau der Welt*.[13] It appeared in 1928. Here Carnap wrote:

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[12] What are known as 'modernist' movements in poetry, painting, and architecture had in fact made their appearance already in the decade preceding the outbreak or the war. This fact is, I think, essential for understanding their post-war vogue.

[13] Here quoted from the English translation: Rudolf Carnap, *The Logical Structure of the World*, translated by Rolf A. George, Berkeley and Los Angeles 1967.

'We feel that there is an inner kinship between the attitude on which our philosophical work is founded and the intellectual attitude which presently manifests itself in entirely different walks of life; we feel this orientation in artistic movements, especially in architecture, and in movements which strive for meaningful forms of personal and collective life, of education, and of external organization in general. We feel all around us the same basic orientation, the same style of thinking and doing.—It is an orientation which acknowledges the bonds that tie men together, but at the same time strives for free development of the individual. Our work is carried by the faith that this attitude will win the future.'

6

Naturally, the First World War and the soon frustrated hopes which the revolutionary upheavals in its wake had kindled could not fail also to cast doubts on belief in progress through increased 'rationalization' of life and society. There had been early critics throughout the 19th century—men such as Kierkegaard, Dostoyevsky, Nietzsche and the great historian Jacob Burckhardt. Spengler's *Decline of the West* impressed intellectual moods both after the First and after the Second World War. In the 1920's there was also an anti-modernist and neo-conservative intellectual trend. Some of its representatives even lost their way into the irrationalist camp of political reactionism.

In sketches for a preface to another work in philosophy of the same time which, however, remained unpublished, the author, Ludwig Wittgenstein, characterized the spirit in which his book was written as follows:[14]

'This is not—the spirit of the main current of European and American civilization. The spirit of this civilization makes itself manifest in the industry, architecture and music of our time, in its fascism and socialism, and it is alien and uncongenial to the author.' And: 'Our civilization is characterized by the word 'progress'. Progress is its form—It is occupied by building an ever more complicated structure.—I am not interested in constructing a building, so much as in having a perspicuous view of the foundation of possible

[14] The sketches are printed in Ludwig Wittgenstein, *Vermischte Bemerkungen*, ed. by G.H. von Wright, Suhrkamp, Frankfurt am Main 1977 and published in English translation in Ludwig Wittgenstein, *Culture and Value*, translated by Peter Winch, Basil Blackwell, Oxford 1980, p. 6.

buildings. So I am not aiming at the same target as the scientists and my way of thinking is different from theirs'.

Although there is no documentary evidence for it, it seems obvious that Wittgenstein's words were meant to answer those of Carnap which I quoted. At the time when they were written, 1930, they represented an undercurrent which, however, has in the meantime risen more and more to the surface.

7

It is significant that both philosophers, Carnap and Wittgenstein, mentioned architecture in the passages quoted. The second, moreover, had himself been active as architect.

The modernist movement in architecture—also called 'functionalism'—is an embodiment of the same avant-garde spirit as is modernism in music, painting, and poetry. But the case of architecture is, from the point of view of a 'diagnostic of the times', of special interest. It problematizes, one could say, the very idea of modernity. This has to do with the fact that architecture—unlike, say, music or painting—does not belong exclusively in the sphere of art. It also belongs in the sphere of technics, and therewith in that of science. It has, moreover, a moral, i.e. social, dimension from which it cannot, like the 'pure' arts, detach itself.

This multidimensionality inherent in architecture is reflected in the very name 'functionalism'—which, by the way, seems never to have become firmly established in Anglo-Saxon terminology. To be functional is to serve a purpose. It is an instrumental(ist) notion. So the question at once arises: What purpose? or Whose purpose? A house or a built up area which is functional for the life of families is not, in general, functional for administrative, commercial or industrial purposes. A single building can, of course, be functional for one or the other of these purposes. But when planning is concerned there may be conflict. Adopting Habermas's handy terminology, this can be described as a conflict between the Life-World (*Lebenswelt*) of people and the System.[15] The concentration of public buildings, banks, and offices in town centres may be functional for bureaucracy and for big enterprizes. But not so from the point of view of the townspeople themselves. The rise in ground prices and

[15] See also the essay by Habermas, '*Moderne und postmoderne Architektur*', in the collection of his essays *Die neue Unübersichtlichkeit*, Suhrkamp, Frankfurt am Main 1985.

rents kills off the small stores and workshops and drives the dwellers to the periphery. As a consequence, those who work in town may have to suffer hours of congested transportation every day from the place where they sleep to the place of their jobs. This, surely, is anything but 'functional'. It gives us reason to ask whether life in the brave new world, for which building, landscaping, and town-planning creates the outer frame, really bears witness to the 'progress' which the theoreticians of modernist architecture, a Le Corbusier or a Gropius, professed and believed in.

Behind this question there is another: What is progress? What does the word mean? Those who talk about it, I am afraid, usually take an answer for granted. In fact, it is not at all clear what the answer is. Since we cannot here bypass the question, we must stop for a moment to reflect on it.

8

Of the three spheres: knowledge, morality, and art, the last two have in common that they are connected with values. The first again is concerned with facts. Just as it was an achievement of the Enlightenment to have defended the autonomy of the three spheres against the encroachment on them of external authority, it was another achievement of this era to have emphasized a separation of facts from values, of *Is* from *Ought*. Thus a conceptual contrast was marked which had not been noted before in the same sharp form. The man chiefly responsible for it was David Hume—the philosopher of whom Kant said that he had awakened him from 'the dogmatic slumber'. It has in recent times become common to refer to this separation—particularly in the form of Is vs. Ought—with the name 'Hume's Guillotine'. One wonders, incidentally, whether the inventor[16] of the name was aware of the irony implicit in the allusion to the executioner's tool. It, too, dates from the time of the Enlightenment; it has become the sombre symbol of the 'dialectics' which led to the terreur and to the crowning of a harlot Queen of Reason.

Now progress is distinctly a value notion. In this it differs from related concepts such as change and growth—and also from development. These latter are (or may be treated as) purely factual. That one state of affairs represents progress in comparison with

[16] Professor Max Black in the essay '*The Gap between "Is" and "Ought"*' first published in *The Philosophical Review 73*, 1964, reprinted in Black's collection of essays *Margins of Precision*, Cornell University Press, Ithaca N.Y. 1970.

another implies that the first, in addition to being later in time than the second, is also, even if not wholly good, so at least better than the second. That something is good or better than something else is, however, not anything which can be established by scientific argument or otherwise on the basis of facts about the things in question.

Here a qualification is in place. It can be an established fact that something is better than something else as a means to some end. This means that the first is more efficient, more useful, for its purpose. It has, as we say, greater instrumental value. Judgements of instrumental value are factual and therefore no 'genuine' value judgements. Pronouncing the end or the purpose good is a (genuine) value judgement. So are all judgements which say of something that it is in itself good or bad, better or worse than something else.

Value is attributed to or conferred on something by a valuating subject. In this sense value is subjective. Only factual judgements are objectively true or false. This view of value can be said to inhere in Hume's distinction. It is a characteristically modern view, I should say. It is not the view of value of Plato or St. Augustine or Aquinas. And not all philosophers agree with it even today.

From what has been said it follows that the sole criterion that progress has occurred in the conditions under which men live is the way in which those concerned value their own situation. The modern Myth of Progress is a conjecture that men and their societies will thrive better if they are free to follow Kant's maxim to trust reason rather than authority. No facts about diminishing illiteracy, improved sanitary conditions or increased per capita income can, by themselves, prove this conjecture true. If it is inherent in the idea of modernity that there are no objective standards of goodness (value), then, in an enlightened view, belief in progress is just another article of faith. It may turn out to have as little rational justification as any which a pope or an emperor or some other pre-modern authority once tried to implant in men.

9

The contrary of progress is regress. Regress means deterioration and decay. That which follows later is less good than that which went before. Just as there exists a climate of opinion which professes belief in progress, there is also one which believes in regress. The first is optimistic, forward-looking, and welcomes change. This

is what we call a 'progressive' attitude. The second tends to be pessimistic, nostalgic, and conservative. In extreme forms it is what we call 'reactionary' or 'retrograde'.

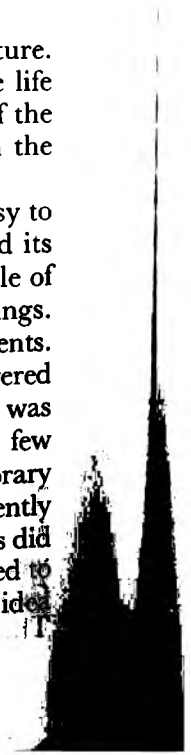
It is noteworthy that the two great civilizations of which our Western Culture is an 'amalgamated continuation'—the Greco-Roman and the Judaic—at no stage in their history entertained the idea of linear, unbounded progress; it is even more noteworthy that both can be said to have shared an implicit faith in the deterioration of the world. From Greek mythology we know the tale of a Golden Age in the infancy of mankind. After it followed, in succession, a silver, a copper, and an iron age. They were characterized by increasing scarcity and material hardship. Also morality deteriorated. Deceit and discord sprang up among men, and there were more and more wars.

Typically, the tellers of the story, from Hesiod on, placed themselves in the iron age, the least good of all. However, there is also restoration in sight. The world will return to another Golden Age. It, too, is doomed to degenerate but also to be restored—in a perpetual succession of world cycles.

The model for the Greek idea of decay and rebirth in history is, of course, the life cycle. Individual plants, animals, and men are born, grow up to maturity, then age and die. But they also have offspring. Why could this rhythm not hold also for a people or a culture or even for the human race as a whole?

There are other familiar processes of a cyclic character in nature. Some are related by analogy, others also by causal tie, to the life cycle. Examples are the four seasons of the year, the phases of the moon, the regularly repeated span between rising to work in the morning and going to rest with the sunset.

Impressive and suggestive as these analogies are, it is not easy to see how they apply to history. The tale of the Golden Age and its gradual deterioration stands in need of a supplement, viz. a tale of how this age is restored through a gradual amelioration of things. This tale, to the best of my knowledge, is never told by the Ancients. We hear of how the depraved man was swept away by angered gods—a Greek counterpart to the Deluge of the Bible. This was supposed to have happened in the copper age. The age of the few survivors was the iron one. In its beginning there was temporary progress. The ascent of primitive man to civilization is eloquently described by Lucretius in his great poem *De rerum natura*. Lucretius did not believe in myths. But in his tale, too, progress gained is doomed to decay; indeed the world itself will one day perish. Thus the Greek idea of history has a predominantly pessimistic flavour.



This pessimism is nowhere more impressive than in Plato's *Politeia* ('Republic'). After having described the Ideal State, based on reason and ruled by philosopher-kings, Plato in the eighth and ninth books of the dialogue describes the successive stages of the state's deterioration. His description is a masterpiece of socio-psychological insight. Next in perfection after the (so far) nowhere realized ideal comes the aristocratic rule of the olden times. It is called timocracy from the word *time* which means awe or respect or honour. It is not instituted by reason but is upheld by the implicit acceptance by the citizens of an inherited order the superior wisdom of which is not questioned. Its rulers are the elder and more experienced. This order is then gradually replaced by an oligarchy of a few rich and powerful men or families. They are often envious of or hostile to each other and tend to pursue their own interests rather than care for the common good. Society is now divided into the rich and the poor. When the rich can no longer rule the masses, a society of a more egalitarian type emerges. It is called democracy. In it the self-interest of the individuals dominates over the solidarity of the citizens. Lawlessness and disorder increase. Finally, a charismatic leader or strong man takes over, exploiting for his purposes the miseries of the poor and the fear of anarchy of the rich. He is the tyrant. Tyranny or dictatorship is based neither on reason nor on respect for legitimate authority nor on the consensus among free and equal citizens, but on brute force. The social order has reached its lowest stage and become as bad as can be. When things cannot deteriorate further there is hope that out of chaos will crystallize a better order, maybe even an ideal state. But how the restoration is going to take place, on this the philosopher—like mythology—is silent.

A practical consequence of this gloomy political philosophy would seem to be an extreme conservatism. If every big change in the body politic must be a change for the worse, the best recipe for the rulers is to guard maximal stability. Only an immobile political order can be a good one.

Plato the realist is as far as can be from the political spirit of Western modernity. But Plato the utopist had an idea of a state built on reason which has nourished this same spirit from its beginning up to the present day.

10

The Judaic myth of regress differs interestingly from the Greek one. It is not cyclic. It foresees a one-way process of gradual depravation

of the sinful man. Its two poles are the Fall of Adam and, in the Christian version, the Second Coming of the Redeemer. These two poles have a transcendental, supranatural or over-worldly, setting. Herein lies the greatest difference between the Greek and the Judeo-Christian 'philosophies of history'. The pole corresponding to the Golden Age is set in Paradise which, the Creation story notwithstanding, is not 'of this world'. The Second Coming marks the end of the world and the transmutation of life to either eternal torments for the doomed in Hell or final union with God for the saved in Paradise Regained.

The finite span of time between the poles is essentially a story of decline. St. Augustine—the Christian Plato—describes it in his monumental work *De Civitate Dei* ('The God-State'). History is a passage through six stages. Like the Greek mythologists, Augustine finds himself in the last and worst period. This, in fact, began with the First Coming. Since then mankind has been awaiting the Harmageddon or universal conflagration which signalizes the Saviour's Second Coming.

Expectations of the near end of the world were almost constant throughout the Middle Ages. They increased in intensity towards the close of the period, when immense vicissitudes befell Western Christendom in the forms of the Great Plague, the invasion of the Turks, the Hundred Years War, and the heresies and final schism in the Church. In this world man can strive for final salvation in the next world. He can work for his soul by extolling the goodness and wisdom of God or by 'imitating' the ways of life of Christ. But he cannot hope for a gradual amelioration of the living conditions of men through changed forms of government or of the social order. Belief in worldly progress is an illusion.

11

In the world thus awaiting its end there was, however, advancement in knowledge and technology. New forces began to mould societies. With these developments new hopes were lit. Eventually men began to dream of progress of their own making also in this world of ours. This happened in the turbulent era of the Renaissance and Reformation. Knowledge which originally was thought needful mainly for the salvation of our souls, more and more took the form of a useful instrument for doing better in this world. The changed attitudes drew inspiration and support from elements in both Judaic and Greek mythology. God had, after all, created man

in his image and given him domination over the rest of nature. Prometheus had infused self-reliance in man and taught him the arts and skills whereby he could enhance his material well-being and advance in civilization. Prometheus was punished for his *hubris*. But the god who punished him was not the loving Father of all Christians but an envious and distrustful invention of pagan imagination.

Yet this Christian God, too, had to recede somewhat in the background of men's thinking before the change in climate of opinion became possible which marked the birth of what I have called classical modernity with its belief in the advent of an era of linear and unending progress for the emancipated man.

12

In order to appreciate the novelty and persuasive force of this modern idea of progress, we must view it against the background of what is perhaps the most significant single feature in the cultural physiognomy of the 19th century. This is the idea of development or evolution. It is by no means confined to biology. Nor is it of biological inspiration, like the Greek idea of growth and decay. Its roots should rather be sought in an awakening sense of historicity. By this I mean a ('secularized') interest in the origin of things and a view of history, not as a haphazard flow of disjointed events, but as development, i.e. as a directed and ordered succession of 'genetically' related stages. A view of the present as a child of the past.

Long before Darwin, Goethe wrote his *Metamorphose der Pflanzen* and Lamarque his *Philosophie zoologique*. The work of Rasmus Rask and Jacob Grimm on the evolution of spoken sound is also pre-Darwinian. It laid the foundation of the mighty tradition of 19th century historical linguistics, *Sprachgeschichte*. A paradigm for Darwin himself was Lyell's work on the history of the Earth. But, of course, the crowning achievements of this trend in the biography of ideas were Darwin's *The Origin of Species* and *The Descent of Man*. Darwin and Darwinism had repercussions in all areas of culture and science, comparable in paradigmatic strength to the impact of Newton and Newtonianism a century and more earlier.

The evolutionism and historicism of the time is, naturally, reflected also in philosophy. The three main figures here are Hegel, Comte, and Spencer. They are also good illustrations of characteristic differences between the three main national divides in 19th century European culture: the German, the French, and the English.

Hegel's 'phenomenology' of the development of the spirit (*Geist*) is a speculative and rather 'Teutonic' tale of man's ascent on the ladder of freedom. Comte's three stages: from the religious through the metaphysical to the positive may be said to reflect the 'Gallic' spirit of order and reason. Spencer is less speculative than Hegel and less rationalist than Comte. He rather represents the common sense of British empiricism.

Spencer is also the first to have attempted what may be called a scientific analysis of the meaning of evolution and development. According to Spencer, a whole or totality is the more developed the more differentiated it is into parts with specialized functions. Secondly, it is more developed the more integrated its parts are for the functions proper to the whole. Problematic aspects aside, Spencer's characterization of evolution through differentiation and integration—Spencer later added a third feature which he called determination—is probably as good as one can wish for.

But what has all this to do with progress? Progress, we said, is a value concept. Why, in which respect, is the in Spencer's sense more developed whole better than the less developed? Could not the process we call evolution equally well be one of decline and regress?

Spencer himself was aware of a problem here. But he did not doubt that evolution was progress, was for the good. (Darwin, too, implicitly shared this view.[17]) 'The transformation of the homogenous into heterogenous is that in which progress essentially consists', Spencer wrote.[18] The law of organic progress, moreover, is for him the law of all progress. Here 'all progress' also includes moral improvement, the progressive ascent to the good and the 'evanescence of evil'.[19] Progress, moreover, is not accidental. It is a kind of Law of Nature. Spencer repeatedly calls it a 'benevolent necessity'. This means that evil and immorality will have to disappear and man become perfect. Perfect also as a member of society. Because, Spencer says, 'surely must the human faculties be moulded into complete fitness for the social state'.[20]

That moral progress is a (natural) necessity is, of course, sheer illusion. But there is a sense in which the question whether develop-

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[17] *The Origin of Species*, reprint of sixth edition, Oxford University Press, London 1951. See especially Chapter Four '*Natural Selection; or the Survival of the Fittest*'. Ib., p. 85: '—natural selection can act only through and for the good of each being".

[18] Spencer, *Essays*, D. Appleton & Co, New York 1891, p. 10.

[19] The quoted words are the title of a chapter in Spencer's work *Social Statics*.

[20] Spencer, *Social Statics*, Williams and Norgate, London 1902, p. 31. The quotation continues 'so surely must evil and immorality disappear; so surely must man become perfect.'

ment means improvement has an affirmative answer. The more developed a species, the better adapted to the environment are, on average, its individual members. That is: the more capable are they to satisfy their needs for nutrition, protection, and procreation. What holds for the relation between species, holds mutatis mutandis also for groups and individuals inside the species. Being more evolved thus means being fitter, stronger in what is called 'the struggle for survival'. Development has survival value, i.e. value for the purpose of survival. This is an instrumental sense of betterness (goodness).

Is survival then not a good thing in itself? From the point of view of the survivor it is. This, I think, is 'true by definition'. But is the species, or the group, or the individual, or the organization which survives in competition better, more valuable, than the one which perishes? It is not clear that the answer to this question must be affirmative. Nor that it must be negative. The only thing that is clear is that it cannot be decided on the basis of scientific or otherwise 'naturalistic' criteria of development.

We have arrived at the very core of the question What is progress? And we have also laid bare one of the main sources of confusion and obscurity in efforts to answer it. This source is a tendency to transform questions of the value of ends into questions of the value of means (to those ends). One could call this a tendency to factualize or to instrumentalize or to reify value. It has been greatly encouraged by Darwinism and other evolutionist doctrines, but also by developments in science generally. For this one cannot blame science. But one can deplore the tendency. Because it makes us blind to the genuine issues of value and thereby also of progress.

13

It is something like an irony of the history of ideas that the century which, in the form of Darwinian evolutionary theory, seemingly afforded scientific underpinning of belief in progress did the same also for belief in regress. This second kind of quasi-scientific support came from an achievement of the century which in importance bears comparison with Darwin's. This is the Law of Conservation of Energy and its 'complement', if I may call it so, the Second Law of Thermodynamics, also known as the Law of (Growing) Entropy. According to these principles, roughly speaking, all forms of energy are finally transmuted into equivalent amounts of heat (thermic energy). Furthermore, differences in temperature tend to cancel out

until a stage is reached when the molecular motion, which is the generator of temperature, ceases. The entire 'clockwork' of the universe comes to a standstill at the 'temperature' (really the no-temperature) of absolute zero. The state is known as the Heat-Death. It is an undifferentiated 'egalitarian chaos' with no order or structure. The process terminating in this state is the antithesis of development in the Spencerian sense. The Heat-Death is thought to be the ultimate state to which the entire universe tends. Evolution is only a temporary move in a contrary direction in limited regions of space and time.

Few, if any, scientific theories have had a more powerful influence on the intellectual imagination than the Second Law of Thermodynamics.[21] (Darwin's theory is not so much an appeal to imagination as an encouragement to scientistic superstitions about progress.) Many critics of contemporary civilization, who viewed with misgivings ongoing tendencies to egalitarianism, cultural nivellation, standardization, and internationalism, saw in them an analogy in history to the workings of that great 'equaler', the Second Law of Thermodynamics, in the universe as a whole. Thus, for example, Nietzsche, and Spengler, and the Adams Brothers: Brooke and Henry. With Nietzsche the speculations led to a version of the ancient doctrine of world-cycles. According to this version the universe will, within immense spans of time, return again and again to identically the same state.

It almost goes without saying that these analogies between thermic processes and history, however suggestive they may seem and however ingeniously worked out, are pure fiction. Thermodynamics is just as worthless as a scientific underpinning of belief in regress and decay as the Theory of Evolution is for belief in progress.

It deserves mention here, however, that the notion of entropy has come to figure prominently in recent scientific developments of our century. I am referring to research, associated chiefly with the name of Ilya Prigogine, on energy flow in what are called 'dissipative systems far from equilibrium'. Living organisms exemplify such structures. This research, too, has inspired applications by analogy to human affairs. Prigogine himself has become something of a scientific guru for many social critics. I think we have good grounds for viewing the phenomenon in question with guarded scepticism. But it is also obvious that considerations about entropy

[21] On this see the interesting book by the physicist Stephen G. Brush, *The Temperature of History. Phases of Science and Culture in the Nineteenth Century*, Burt Franklin & Co, New York 1978.

increase have sound and valuable applications to research on energy consumption, recycling, and waste in agricultural and industrial systems. Such research may turn out to be of practical significance for coping with problems which now weigh heavily on what I would call the 'environmentalist conscience' of modern man.

14

I have tried to clear away the mist of pseudo-science hovering over beliefs in progress as well as in regress. Let us now take a look at the rational grounds which might have justified the early beliefs that the road of emancipated man to the future was going to be a road of progress.

I shall review this question briefly from the standpoint of the three spheres which the Enlightenment thought of as autonomous and wanted to liberate from the tutelage of heteronomous authority. These were the spheres of knowledge, of morality, and of art.

In the realm of knowledge, amelioration means in the first place growth, the accumulation of more and more recorded truth. In the natural sciences it also means increased unification of knowledge by means of explanatory theories. Newton's theory of gravitation and Darwin's of natural selection are good examples. It may be that the advancement of science is not a linear and steadily accumulative process. Shifts in paradigms, sometimes called 'scientific revolutions', stand for discontinuity and changes of direction. But such jumps and bends do not void gains already attained. They rather follow the schema of what Hegel called *Aufhebung* and *Aufbewahrung*. This means that the facts remain 'on record' even if they are interpreted in a new way or if their position within the theoretical frame is shifted.

Is the accumulation of knowledge progress? Is it a good thing to get to know more? Many philosophers have thought that knowledge is a value in itself. Then presumably a greater amount of knowledge is more valuable than a lesser amount. I shall not deny that it sometimes is so. Whether it is always so seems to me less certain.

What is certain, however, is that (the growth of) knowledge in general and scientific knowledge in particular may have instrumental value for purposes which lie outside the accumulative process itself. 'Knowledge is power', as Francis Bacon said. He meant power to produce the desired and prevent the undesired by manipulating the causal mechanisms which govern natural

processes. Or, as the French positivists after Comte put it: '*Savoir pour prévoir pour pouvoir*'. Both formulas reflect the technological aims of knowledge, if by 'technology' we mean science-based technical innovations in the service of man.

The instrumental value, i.e. usefulness, of science has steadily increased since the days of Bacon. Not least in the second half of our century has this value been enormously enhanced. So much so that it is threatening all our other notions of value with a corresponding 'reification'. A striking example is the commercialization of art and of creative achievement generally.

Is this increase in instrumental value of science, i.e. the enhancement of man's power over nature, progress—a good thing in itself? Condorcet, as we have seen, held that all advance in science is *ipso facto* beneficial. But we must surely take a more guarded attitude. Whether scientific knowledge is beneficial or not depends on the purposes for which it is used. And that science can be put to serve destructive and evil purposes should by now be clear to everyone.

One thing which power over nature can achieve is to increase the material well-being of men. Of this industrial and technological developments give impressive evidence. There can be no question but that enhanced material well-being, standard of living, in many, perhaps most, cases is progress in a genuine sense of the word. This means that it is valued, by those who benefit from it, as an improvement of their lives. But it is not necessary that this valuation will persist when growth has reached above a certain level or when its repercussions on the environment or on the social order have to be taken into account.

So much for the sphere of knowledge. What then about that of morality?

Moral progress, as envisaged by the heralds of modernity, consists in the perfection of man. What was meant was not so much progress in the life of the individual as progress from generation to generation. Just as the accumulation of knowledge does not mean that individual men know more and more, but that the impersonal, total 'body of knowledge' increases as Science progresses, similarly Man, the human race, not necessarily individual men, becomes with time better and better, more civilized, more 'humane'. This idea of perfection or progress hardly makes sense outside a social or political context. That the perfected man is more civilized than his less perfect ancestors should mean that he is more tolerant, less selfish and greedy, more inclined to see a loving brother in his neighbour than an alien enemy. Then also the social order is correspondingly perfected. It tends towards a just society of free

and equal citizens. Progress thus conceived is concomitant with something which can, in a broad sense, be called a democratization of institutions and of the system of government. Ideally, a democratic society is an order in the creation and maintaining of which every member of the society is also a participant.

It is much more difficult to get a foothold for the idea of progress in the sphere of art than in the spheres of knowledge and morality. It is even questionable whether progress has any application at all to art. The nearest analogy to progress which I can see in the emancipation of artistic activity from the tutelage of religious belief or moralistic edification is an enhancement of the artist's possibilities to express the moods of his time, its hopes and fears, its visions of beauty but also its disgusts.

Schiller envisaged an 'aesthetic education of man' in the spirit of modernity. '*Alle Menschen werden Brüder*', sings the chorus in Beethoven's Ninth. This is the Enlightenment's great hymn to progress. But perhaps the special rôle of art within modernity was, in the longer run, not so much to extol its hopes as to debunk its illusions, to reveal its agonies, and thus to pave the way for a climate of opinion which comes after the modern.

15

The modern idea of progress thus exhibits two main divides, partly of different historical origin. One is the idea of progress through the accumulation of knowledge and advancement of science and technology. The other associates progress with the perfection of man and the civic order.

Science is the foundation of man's technological mastery of nature. In the frame of an industrialized mode of production this mastery has come to further economic growth and higher standards of living. The alliance of science, technology, and industry, can be called a techno-system. It tends to become global and transnational. Therewith it also becomes increasingly independent of the socio-political system(s) organized on the basis of cultural and ethnic kinship into national states. The increased tension between the national and the transnational, i.e. between the political system and the technosystem, is one of the characteristic traits of the physiognomy of late 20th century civilization.

Economic growth is a measurable quantity. It can be assessed in the figures of GNP, per capita income, volume of production of goods, and in various other ways. Economic growth has become a

main motive force for the expansion of the technosystem. As a consequence, the progress which was thought to follow from the advancement of science (accumulation of knowledge), tends to become identified with economic growth as such. I shall refer to this identification as the Quantification of Progress. Progress thus measured is no longer a value concept. It is a 'factualized', value neutral notion, an instance of what philosophers call the reification of value.

The second grand idea of progress, the perfection of man, was thought to imply a democratization of the socio-political order. The process, having started in England centuries earlier, received a decisive impetus from the American and the French revolutions. It was, after a period of stagnation, further accelerated by the events of 1848 and also by the unification of the states of Italy and Germany. It became global, world-wide, in the aftermath of the first and second world wars. In what we call the Western World it took the form of parliamentary government, granting of universal suffrage, civil rights, freedom of the press, etc. In other parts of the world, first Russia and later China, the process assumed different forms. The people's democracies of the East were very unlike the liberal democracies of the West. So much so that the one side tended to regard the use of the term 'democracy' by the other side as a misnomer or as mockery. These differences notwithstanding the question is essentially of one and the same big process of modernization (rationalization) of societies, the breaking up of old social orders and the shaping of new ones, stamped not least by belief in the blessings for the peoples of industrialization and technological advance.

Just as there is a tendency to identify progress through the accumulation of knowledge with economic growth, there is a corresponding tendency to identify progress through social reform with the external forms of rational administration (bureaucracy) and law-giving in the name of the people. I shall speak of this as a Formalization of Democracy. This is another reification of the value notion of progress. Like the idea of economic growth in relation to the technosystem, the idea of the democratization of society has been a main motive force of the action of the political system on the road of modernity in the past 200 years.

Whether a society thus 'democratized' is the more just, the more humane order which the philosophers of the Enlightenment saw emerging in a disenchanted and rationalized world seems increasingly problematic. There may even inhere a kind of contradiction between two of the main aspects of democracy, the egalitarian

and the emancipatory one, between equality and freedom. A maximally egalitarian society can perhaps not exist without individual freedom being heavily curtailed, and a maximally liberal society not without engendering inequalities among its members.

16

The sole measure of progress as a value, we said, is the way people thrive in the circumstances under which they live. These circumstances—the external frame of our life-world—are moulded by developments within the two systems, the technosystem and the political system. As we have seen, these systems have their characteristic measures of progress: increased wealth in the one case, formalized democracy in the other. These measures are factual and not evaluative.

It is contingent whether the two types of measure of progress, the evaluative one of the people themselves and the reified ones of the two systems, give concordant results. Do economic growth and formalized democracy enhance the quality of life? Since the answer may be Yes or No, depending upon details of the situation, one can speak of a latent tension between the life-world and the system-world.[22]

It is, moreover, also contingent to which extent the measures of progress of the two systems themselves mutually agree. Are economic efficiency and extended democracy compatible, or not? Does, for example, participation in the management of enterprizes by all those employed in them further or hamper productivity? This, incidentally, has become a grave problem in the only society which has made a serious effort to implement a system of self-managing economic communities, Yugoslavia. Thus one can also speak of a latent tension between the two systems. Both have a tendency to autonomy and domination. We live in an era when the technosystem tends to get the upper hand in relation to the political system. The decisions of the latter are often nothing but a confirmation of a fait accompli created by the former.

The quantification of progress in economic terms had its remote origin in the emancipation of knowledge (science) from the external

[22] The idea of a contrast and tension between 'life-world' and 'system-world' is a main theme in the mature work of Jürgen Habermas. Habermas's writings have been a source of inspiration for my own efforts to attain to a critical understanding of the world in which we live. It is possible, however, that I give to the terms 'life-world' and 'system' a somewhat different connotation from the sense in which they occur with Habermas.

authority of Church and State. Analogously, the reification of progress in formalized democracy had its historic roots in the emancipation of man as a moral subject. What happens now is that the two systems are recoiling destructively on their own origin.

The technosystem is threatening the autonomous pursuit of knowledge for its own sake. Scientific truth is not contested, as of yore, by another claim to truth raised by religious or other authority. But research and academic training are to an increasing degree oriented toward the ends of economic growth, competitive power, and technological innovation. In the educational programs of states the notion of schooling (for a profession) takes the place of that of studying (for one's education). In a corresponding manner, the autonomy of the subject is threatened by the necessity to conform to the pressures of opinion and to regulations in the creation of which he has not participated and the sense of which he often cannot understand. The individual is alienated from the impersonal social machinery run by selfrighteous bureaucrats. His life-world is hedged in so that his 'real freedom' is reduced to narcissistic indulgence in external symbols of status and well-being which consumer goods and material possessions offer.

Thus the emancipation and autonomy of man both as knowing subject and as self-determined agent threatens to get lost because of the deforming influence on the life-world—its 'colonialization' to use Habermas's term[23]—by the two systems. The threat materialized would mean the bankruptcy of the lofty ideals of Classical Modernity and the final debunking of its great Myth of Progress as a delusion. Belief in the 'myth' still prevails and is proclaimed by a thousand voices of advertizers and propagandists. But the progress of which these latter day Sirens sing is not the perfection of which the Enlightenment dreamt but its reified identification with economic growth and extended formalization of social conduct.

17

The second great shock to modern society came with the rise of fascist barbarism in Europe and the consequent 1939–45 war. The reaction which followed after the second war was very different from the reaction after the first. The end of the war did not kindle great hopes for peaceful developments in the future. It had barely

[23] 'die Kolonialisierung der Lebenswelt durch Imperative verselbstständigter wirtschaftlicher und administrativer Handlungssysteme'. In '*Moderne und postmoderne Architektur*', op. cit., p. 28.

ended when it was succeeded by the 'Cold war'. Nor did its end release a superabundance of creative energies. This second fact is very striking when we compare the 1920's with the late 40's and the 50's. The first was perhaps the most creative decade of the century in science as well as art. This was eminently true of the defeated Germany (Berlin), the disintegrated Habsburg empire (Vienna), and—for a brief period—also the revolution shaken Russia. On the other hand, a singular barrenness in the arts and, as far as theoretical developments are concerned, also in the sciences,[24] is characteristic of the second post-war period. Nothing comparable to modernism in architecture or poetry, or to neopositivism in philosophy made its appearance after the chaos of the war years. What we have so far witnessed in the second half of the century have been stupendous technological advances; the use of nuclear power, the computerization of work of all kinds, genetic manipulation—only to mention the most revolutionizing novelties. In the arts we have seen wild experimentation coupled with nostalgic, pastiche-like mixing of styles, not least in architecture.

Hand in hand with these developments there has taken place an integration of practically the entire globe in a network of industrial technology, international trade, and banking. In the West we have enjoyed an unprecedented increase in material standards of living. In the 'under-developed' parts of the world there is famine and growing relative poverty—but also a desperate struggle for an enlarged share in the cake of 'progress through modernization'. In all quarters, advanced as well as backward, developments testify to an ongoing quantification and formalization of the idea of progress with a corresponding deforming influence of industrialization and quasi-democracy on traditional patterns of life. This deformation is particularly striking in those parts of the world which are euphemistically called 'developing countries'.

18

As I see it, the climate of opinion, the *Zeitgeist*, of our time is predominantly one of concern for the malaise caused by the encroachment of the two most typically 'modern' systems, viz. the

[24] This impression would be contested by many. But I think that the contrary opinion is misled by the enormous increase in the practical importance and therewith also social prestige of science in recent decades. This is largely a consequence of rapid and spectacular technological developments and the impact they have had on life.

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industrial mode of production and the bureaucratic-paternalistic forms of democracy, on the living conditions of men. At the level of critical reflection this concern manifests itself as a problematization of the emancipatory ideas of classical modernity and as lost faith in the 'progress' which was thought to follow upon their implementation. I propose to call this *Zeitgeist* Late Modernity.

Is this not the climate that is also called Post-Modernity? When characterized in the way I did, the name does not seem apt for it. The *Zeitgeist* as described is one of crisis and criticism. It is the crisis of an idea which was born in the days of the Enlightenment, which hovered over Western Civilization for a century and a half, and which is now turning self-critically against its own assumptions and promises.

It is not surprising that in the wake of such self-criticism phenomena crop up which signalize a conscious break with modernity and the proclamation of something new. These are the things we list under the heading 'post-modern'; a very mixed bunch. We know them from architecture, literature, philosophy—and also from experimental forms of new life-styles. It is perhaps no coincidence that architecture which was in the vanguard of what I called neo-modernity or modernism was in fact the field in which the name 'post-modern' in its now current sense first established itself.

If Late Modernity is predominantly a sombre mood, the undercurrent in it which calls itself post-modern is predominantly hopeful. It sees modernity as something essentially overcome, transcended, and in post-modernity a beginning and a promise of a renewal in culture and forms of life.

A skeptic may prefer to see in the post-modern phenomena symptoms of the malaise of modernity rather than a cure for it. I am myself inclined to see them in this way. Then they appear as reflexions in the cultural superstructure of the influence on life of developments in the technosystem and the socio-political order. Even if this is the right way to view them, it does not exclude that they may also forebode readjustments in the relationship between 'life-world' and 'system'. Whether this will mean a 'transcendence' of modernity to something which comes after it, or should rather be looked upon as a continuation of what has been called 'the modern project'[25] may be a matter of taste to decide. The time-perspective for a more definitive judgement is still lacking.

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[25] J. Habermas, '*Die Moderne—ein unvollendetes Projekt*', in *Kleine politische Schriften I–IV*, Suhrkamp, Frankfurt am Main 1981.

One thing, however, seems to me certain. This is the death of certain great tales ('grandes récits') to use the term of Jean-François Lyotard, the French philosopher who has made the perhaps best articulated effort to locate post-modernism on the cultural map.[26] The great tales of pre-modern times we find in the mythologies and religions of past cultures and in the efforts of philosophers to capture in 'systems' of rational thought the essence of being and the destiny of man. Modernity may be said to have substituted for these all-embracing creations of the human mind others, no less absolutist secularized tales of 'the education of mankind' for the promised land of freedom and reason which it was supposed to enter when the old idols had been crushed. One of these great tales was the one which I have called the Modern Myth of Progress. It will not survive the crisis of Modernity in its late stage.

19

I shall conclude with a plea for what I would call a 'de-mythologized rationalism'. To abandon belief in progress as a historical necessity is not to abandon work for progress as a task. This task, as I see it, is essentially a critical one. Because even though the original myth is dead, it survives in the derivative forms which identify progress either with economic growth or with formalized democracy. These fossilized remains of an original optimistic belief continue to exercise a strong influence as motive forces for technological and societal developments. They motivate the actions and decisions of technocrats on the one side and politocrats on the other, partly in agreement and partly in opposition to one another.

To debunk these false mythologies is, I think, the greatest service intellectuals of our time can do to the cause of progress. To debunk them is to expose the lack of rational justification for the distorting effects on life stemming from the systems. It is also to urge those who exercise power to consider the value of the ends for the attainment of which their acting and doing are the means. It is therefore a plea for a form of rationality which has tended to atrophy under an excessive growth of the instrumental uses of reason. In Weberian terms one could call it a plea for *Wertrationalität* in a

[26] Jean-François Lyotard, *La condition postmoderne*, Editions des Minuit, Paris 1979.

culture which has become obsessed and twisted by a hypertrophy of its capacity for *Zweckrationalität*.

The three catchwords of the great upheaval which marked the beginning of the modern era were *liberté*, *egalité*, *fraternité*. The dialectics of forces through which one has tried to implement the first two ideals has gradually undermined and eroded the belief in progress vested in their implementation. We need not reject the ideals, but we have learnt to view with skepticism their full mutual compatibility. Of the three slogans, the one which still holds forth an unconsumed hope is *fraternité*, the idea of the universal brotherhood of men. In a world which is in a process of unification thanks to technological and industrial developments and the rationalization (democratization) of the socio-political orders, the demand on solidarity among men has acquired new dimensions. It can no longer be restricted to a narrow circle of immediate kinship of blood or professional interests. It must transcend all boundaries of nation, race or religion so as to become a consciousness of global responsibility—'global' also in that it extends to those who after us will trample this earth. At bottom this is nothing but a fulfilment of the Christian command that we should love our neighbour as we love ourselves.

Will this command be fulfilled, the hopes held forth in the third slogan of Modernity materialize? It is futile to brood over the question. To answer Yes or No would be to cede to the illusions of myths of progress and of regress respectively. Of them we must beware. The only answer we can give to the question whether there is hope for the future of man runs: Let us work for its fulfilment!

XIII

SCIENCE, REASON AND VALUE

1

It is a commonplace that the civilization we call Western is the heir of two great legacies. One is Judaic, the other Hellenic. As symbols for them one also uses the names of two cities: Jerusalem and Athens.

The Judaic legacy, continued in Christianity, is a religious and moralistic tradition. From the ancient Greeks we inherited the belief in the intelligibility of the natural order of things and the spirit of rational inquiry which is the ethos of science.

Less of a commonplace is, I think, the ways in which the inherent tension between these two legacies is reflected in the turbulent technological developments, the crisis of spiritual values, and the threats even to man's physical survival which have become characteristic of the twentieth century in its final decades.

The two traditions were in origin alien and even hostile to each other. Their fusion into the stem of Western civilization is a story of contest and mutual suspicion. To mediaeval Christendom Greek philosophy was still only an *ancilla theologiae*. The renaissance of ancient ideals effected, in the first place, a tremendous surge in the arts and eventually also triggered what is known as the 'scientific revolution'. For a century or more it looked as if the humanism of our classic inheritance had been firmly integrated with the moralism of a Christian society. This was the time, roughly, when the Humboldt University, the Ecole normale, and Benjamin Jowett's Oxford in their different ways set the educational ideals for the intellectual élite of Europe. This harmony of forces, stemming ultimately from Jerusalem and Athens, no longer prevails. Their dialectic opposition is once again shaking the foundations and threatening to shatter the unity of Western civilization.

2

It is a characteristic of Judaism and of its two main offshoots, Christianity and Islam, that they claim authority for a revealed word, recorded in a Holy Book or scripture. What the Torah is for the Jew, the Bible is for the Christian and the Koran for the Moslem; a supreme authority in matters of true belief and right conduct. The word of God is mediated to man through a charismatic leader or 'prophet'—a Moses or a Christ or a Mohammed.

The authority of the Word is absolute and cannot be doubted. But in matters of application and detail it stands in need of interpretation. And interpreters may disagree among themselves. Hence, the tension between orthodoxy and heresy, the threats to the unity from schism and sectarianism, which have been the source of so much discord and merciless fighting among the followers both of Christ and of Mohammed.

As long as the Word is held sacred its meaning must be thought univocal. A split in the unity is therefore not, in the first place, a plea for toleration. Rather, it nourishes the mental attitude we call fundamentalism. This is a weakness inherent in every religion which claims possession of a revealed truth. This weakness is still a burden on our cultural tradition.

The existence of rival claims to the one right interpretation of the primal Word cannot, however, in the longer run fail to undermine its authority—and therewith also to promote, first toleration and then laxity in matters of religion. This is what has happened with Christianity in the process called secularization. If toleration means a 'humanization' of religious attitudes, secularization of the forms of life may in the end mean the gradual erosion, the withering away of religion itself.

3

'In the beginning was the Word.—And the Word was with God.' It is a little ironic that these words which epitomize the religious frame of mind which we have inherited from our Judaic cultural ancestors were written in Greek. Because nothing could be more foreign than they are to the Hellenic spirit.

The Greeks had no sacred book of their own, and their gods were the all-too-human creations of an intelligent and playful imagination. The Olympos was no indisputable authority in matters of truth or of right and wrong.

Yet the Greeks, too, may be said to have acknowledged an other-than-human authority in these matters. This was the order which seemed to prevail in the world as a whole. The Greek word *physis* has the same double meaning as has our derivation from its Latin equivalent *natura*. It means both the physical world or nature around us and the principles at work in it. In this second sense, *physis* was also a *logos*, an intelligible message. Not, however, in the form of a Word proclaimed by God or his Prophet, but in the form of a Meaning to be unravelled by the inquiring mind.

It is characteristic that much later in history, partly under the impact of Christian ideas, but partly in opposition to them, getting to understand this meaning too was likened to reading a book. This was the 'Book of Nature'. Studying it was thought equivalent to scientific enterprise.

Accepting the metaphor, we can note that the way the Greeks tried to read the book of nature was very different from the way it has been read by Western scientists since the days of Galileo. The Greek contribution to the bulk of what we would call 'scientific knowledge' is in fact surprisingly small—probably smaller than the contributions of some other early civilizations. One can account for this by saying that science with the Greeks remained 'embryonic', but little developed. This is the view one takes, for example, when one labels the speculations of the pre-Socratic natural philosophers a first step on the road to modern physics and chemistry.

But rather than to view Greek science as 'backward', one should acknowledge that it was 'science' in a different sense from ours. It was oriented towards different goals. Greek science was value-oriented in a way modern science is not. It tried in the rational order of nature to discern a norm for a reasonable order of society, to look for standards of a good life and for limits which man could not with impunity transgress. This reading of the rational as the reasonable is alien to us.

It should be noted in passing that the Greeks were not unique in their view of the order which prevails in nature. We find something similar in ancient Chinese culture. Here, too, there is a recognition of principles governing natural events as standards for a wise arrangement also of human affairs. These are the opposite forces of Yin and Yang the equilibrium of which measures an optimal order of things.

The Judaic attitude to truth encourages trust in external authority and the superior wisdom of the Word. The Hellenic attitude again may be said to encourage inquisitiveness and a will 'to search for oneself'—to paraphrase one of the remaining fragments of

Heraclitus. The negative aspect of the former attitude is intolerance and a tendency to dogmatic fundamentalism. The danger inherent in the latter is that the conflicting views of enterprising 'searchers' lead to relativistic scepticism and therewith indifference in matters of belief and rightness of conduct. Whereas the first attitude makes God the measure of all things, the second tends to let Man usurp this position. If God is one, truth is still univocal. But since men are many, truth runs the risk of being fragmented into a multitude of individual opinions.

What is known as the Socratic tradition in Greek philosophy, from Socrates through Plato to Aristotle, was a tremendous intellectual effort to curb the relativism of the *Homomensura*-principle of the Sophists. Analogously, within the Christian tradition has existed an urge to subject the revealed logos to rational scrutiny and reconciliation with the human intellect. Scholasticism of the high Middle Ages gives impressive testimony to this. But, it is clear that a civilization which builds on legacies from ancestral sources as different as Jerusalem and Athens, has had to struggle for their harmonization and, at times, to experience frightful agonies of unresolved contradictions.

4

In a novel[1]—nowadays seldom read—the master architect of the British Empire of Victorian times, Benjamin Disraeli, contrasted our Judaic and Hellenic legacies with a new one, then in making. Its symbolic capital he named Manchester. These are his words:

> Faith hovers over the towers of Jerusalem; and Athens embodies the pre-eminent quality of the antique world, Art. . . . What Art was to the ancient world, Science is to the modern: the distinctive faculty. In the minds of men the useful has succeeded to the beautiful. Instead of the city of the Violet Crown, a Lancashire village has expanded into a mighty region of factories and warehouses. Yet, rightly understood, Manchester is as great a human exploit as Athens.

The statesman of artistic imagination goes on to say that 'It is the philosophers alone who can conceive the grandeur of Manchester,

[1] *Coningsby*. I am indebted to a paper by Freeman Dyson called *Athens and Manchester* for the theme of thought invented by Disraeli. My own development of the theme is rather different from its variation by Dyson.

and the immensity of its future'. So, I feel myself entitled to take up his words for consideration here.

The contrast Athens—Manchester as posed by Disraeli is not altogether felicitous. We owe to Athens at least as much in the sphere of thought as in that of art. Moreover, it is not of science that Manchester of the 19th century is the well-known symbol. The Lancashire city stands out symbolically for the dawn of a new era in the history of mankind, following upon what is known as the industrial revolution.

The industrial mode of production is at least as old as urban forms of life. Industry was not born in Manchester. What took place there can perhaps be best described as the cementing of that peculiar alliance between science and craft we call technology. It revolutionized in the first instance the work of the hand—thereby making possible the mass-production and worldwide distribution of material goods which has since been characteristic of industry. Later, in our century, it has made a comparable impact on work done by the brain—and therewith on control and steering of human activities. This second big change has been described as a transition from the industrial to a post-industrial type of society. In its most recent phase this is also spoken of as the information society. The best name for these new forms of life seems to me to be 'the technological society', and for their breakthrough, not the industrial, but the scientific-technological revolution. Because these societal transformations have their ultimate source in scientific knowledge of how to tame nature's forces and utilize its resources for human ends and purposes.

In the light of the alliance between science, technology, and industry the name 'Manchester' acquires a deeper symbolic meaning. Manchester is not only the place were 'factories and warehouses' first began to dominate the urban landscape; it is also the city of John Dalton and James Joule and the city where Ernest Rutherford reached the peak of his scientific achievement. Dalton put ancient atomic theory on a modern scientific footing. Joule laid the foundations of thermodynamics, the most distinctively new conquest of 19th century physics. And Rutherford opened the path to the interior of that world which Dalton had still thought of as *atomos* in the original sense of the word. What these scientific exploits have meant to the life of men and their societies during the last two centuries is obvious, but perhaps not always rightly estimated in its historic immensity.

Greek science, we said, had an axiological or value orientation. A technological orientation has been characteristic of Western science

from its beginning. Metaphorically speaking, the one type of science aims at obeying, the other at mastering the object of inquiry common to both, which is Nature.

One can find it strange that technological aims are almost completely absent from the pursuit by the Ancients of *episteme* or rationally justifiable claims to knowledge. One can also speculate about the reasons for this. They are not to be attributed to intellectual 'backwardness'. They certainly have something to do with the fact that the economy of the Greco-Roman world was based on slave-labour. This led to a depreciation of manual work as something unworthy of a *kaloskagathos* or cultured gentleman. Aristotle speaks with disdain of the *akribia* or painstaking exactitude in details which artisans display in their work. But it is worth remembering that the artisans in the outgoing Middle Ages were in fact pioneers of what eventually became scientific technology.

That Western science is technologically oriented does not mean that mastery of nature has been and is the only motive force of scientific enterprize. In order to conquer nature one must first know its governing principles. Search for such knowledge I shall, *faute de mieux*, call the epistemic orientation of science. In the order of things it has priority over the technological orientation. This is what Francis Bacon meant when he said that *natura non vincitur nisi parendo*. But the obedience which he then had in mind was not the imitation of natural patterns for the good life, but the respect for facts, the humility and the patience which is required of the inquisitive spirit.

4

The epistemic orientation of science is a manifestation of man's will to find out, for himself and independently of being told, how things are. Its basic psychological drive is, I assume, curiosity. Aristotle expressed the same or a similar idea when he said that philosophy sprang from man's wondering about the world.

It is easy to understand that the legitimation of this orientation should be a problem for a culture in which knowledge in matters of the greatest importance had to be sanctioned by the divine authority of the Word. Right at the beginning of the sacred Book there is an ominous statement of this dilemma. To eat of the Tree of Knowledge was forbidden to man in Paradise. '—thou shalt not eat of it', said the Lord (Gen. 3:17), 'for in the day that thou eatest thou shalt surely die'.

The fruit of the forbidden tree, we are told, gave knowledge of good and evil. Knowledge of facts, it may be argued, is different. But what Greek science ultimately had been in search of was precisely insight into what is good for man. Already by virtue of its value-orientation it therefore stood in latent opposition to the teaching of the Book. But the deeper conflict concerned the epistemic orientation itself: on the one side unquestionable acceptance of authority, on the other side reliance on man's rational capability to find the way to truth.

Christian philosophers from Augustine to Aquinas condemned the mental disposition they call *curiositas*. At the same time they stood on the shoulders of Greek predecessors: Plato in the case of Augustine, Aristotle in the case of Aquinas. But this adoption of Greek philosophy by mediaeval Western culture did not mean acceptance of a rival authority to the Word. This is best illustrated by the case of Aristotle. His views in matters relating to the constitution of the physical world and the laws governing natural events became a 'residuary Word' which, duly commented on and interpreted, had to be accepted by those who were eager to learn, but was not to be tested on the evidence of the senses or refuted by rational argumentation.

The emancipation of science from the tutelage of the authority of the Word—be it the Bible or Aristotle or some other ancient author—was a long and painful process. It had many martyrs, Galileo being far from the only one. But his case stands out from the rest because of its overwhelming moral strength against powers whose authority in matters of knowledge was then hopelessly in decline, weakened both by internal schism in the Church and by the force of new ideas which mark the dawning of the era known as Modernity.

One could try to capture the outcome of the fight for 'the freedom of science' by saying that it ended in a kind of compromise or truce. Science had to relinquish pretensions to be a source of value, leaving to religion authority in matters of good and evil and 'supernatural' truth. Religion, again, was to cease to claim authority in questions of 'natural' truth, accessible to experiment and observation and logical reasoning on their basis. Philosophically speaking, this 'division of competence' meant a conceptual cleavage between fact and value, between Is and Ought, which did not exist either in Greek or in mediaeval Christian thought. One of its implications is the thesis that science is 'value-free'. The distinction is nowadays sometimes referred to as 'Hume's guillotine'. It continues to be a matter of debate—and so does the idea of the value-freedom of

science. But no twists and turns in the minds of philosophers can minimize the historical significance of a progressive tendency to exorcize value-judgements from the proper domain of scientific inquiry. This applies, incidentally, also to the humanities where the scientific study of valuations as facts holds an important but sometimes methodologically confusing position.

Of the two necessary 'renouncements' which I mentioned, one was much more difficult than the other. Emerging Western science had never raised serious claims to be an independent source of value. In this, it was from its birth unlike its Greek ancestor—perhaps because its early infancy was under the patronage of Christian religion. But long after the final split in Western Christendom, churches of various Christian denominations regarded with suspicion or open hostility changes in the scientific picture of the world which were thought to have evaluative implications for the life of Christian man. The struggle over the two world-systems had ended with the displacement of the Earth from its fancied position in the centre of the universe. A few hundred years later, science dethroned man from his unique position as God's created image and made him another member of the animal kingdom. The 'axiological waves' stirred up by Darwin have hardly yet completely abated. But their flood is no longer a serious threat either to the freedom of science or to the purity of a Christian faith.

Today, the battle for the legitimacy of the epistemic attitude we call 'scientific' may be regarded as won. In matters of truth, Reason has inherited the place of God. It is difficult to imagine a return to a state in which opinions on questions of factual truth had to conform to the authority of revelation. Moreover, pursuit of knowledge for its own sake is acknowledged to be an end in itself which needs no further justification. Maybe this has with time become, as has been said,[2] 'a lethal game'—giving new urgency to the threat of the Lord to man in Paradise. But if this is so, it cannot be because knowledge is sought for its own sake—but because of some other orientation, also associated with its pursuit.

5

It is something of a paradox that the intellectual orientation which has problematized the scientific enterprize in our days apparently holds its warrant of legitimacy from the remotest beginnings of our

[2] I found the phrase in a book by Marshal Berman, *All that is Solid Melts into Air. The Experience of Modernity* (1982).

civilization. The same sacred book which declared knowledge forbidden fruit for man also gave him dominion 'over all the earth' (Gen. 1:26). 'Replenish the earth', it said (ib. 1:28), 'and subdue it'.

Did man's dominion also make legitimate his manipulation of nature for the sake of ameliorating his living conditions? I think we can say that it did. Because our Judaic legacy goes back to a time when a great change, then still dimly remembered, had occurred in the life of man—a change at least as profound as any which scientific technology and industry in combination have effected in the last 200 years. This was the change in the state of man from hunter and errant gatherer of food to cultivator of the soil and domesticator of other animals to serve his purposes. This transformation rested on a genetic manipulation of animal and plant life on a much bigger scale than any so far contemplated by latter day agricultural and animal geneticists.

It is true that this change in man's life was not an achievement of 'science as technology'. But, if man's dominion over nature was, as a historical fact, pleasing to the eyes of Jahve—as the Book gives us every reason to think—then it would indeed be plausible to regard the mandate given to man as a *carte blanche* also for the controlled and steered 'subduing of the earth' which science has later made possible.

Man's rightful rule over nature has been a recurrent theme of comments also in Christian theology—from the Fathers of the Church, through mediaeval Scholasticism to the great figures of the Reformation. Of particular significance here is the attitude of Calvin, founder of that branch of Protestantism the crucial rôle of which, as an ideological basis of capitalist economy in combination with an industrial mode of production, has been amply documented.

Man's domination of nature was instituted for his benefit. By helping man to unravel 'the secrets of nature', science has cemented this dominion and also greatly extended its influence. Technologically oriented science has turned out to be of the greatest instrumental value for the achievement of purposes which man sets himself. This in itself is no guarantee that what is achieved is also for his good. Technology can serve purposes which are in themselves either good or evil. It is a knife which cuts both ways. As Friar Lawrence says in Shakespeare's play:

> For naught so vile that on the earth doth live
> But to the earth some special good doth give;
> Nor aught so good but, strain'd from that fair use,
> Revolts from true birth, stumbling on abuse:
> Virtue itself turns vice, being misapplied;

The pioneers of modern science—not only Francis Bacon, but also the by far greater figures of a Descartes or Galileo—did not doubt, however, that the technological powers which science would give to man, would on the whole also be used for his true benefit as measured by Christian standards. In other words, they could not foresee that the instrumental value of science might one day be in conflict with the moral values implanted by religion. Science and technology stood for progress—not only in the form of amelioration of the material conditions under which man had to toil, but also in the form of an enhancement of the ways of life we call civilized.

6

The uses of technology in the 17th and 18th centuries were mainly for what I propose to call (technical) constructions. Examples are sailing ships, canals, fortifications, pumps for mines, improved weapons, and instruments for use in the crafts as well as in science itself. To the same category also belong the two technical innovations which more than anything else revolutionized life in the early and mid-19th century: the steamship and the railroad. The forms of human activity which these innovations most deeply affected were transportation, travel, and warfare. They were of crucial importance to the Western enterprize of colonialism. Their effects on the daily life of families and people were still minor.

The change which the industrial revolution of the late 18th and early 19th century brought about consisted in the use of technology for the manufacture of commodities for a market of consumers. In its origins this change was not a fruit of new advancements in science. James Watt owed little to science and neither did Harrock whose loom revolutionized the cotton industry. It was only after physics had conquered the realm of electricity and chemistry had been placed on a solid scientific basis that technical innovations usable for industrial mass-production of goods began to have their source in scientific discoveries. The dynamo is unthinkable without Faraday, the electric motor without Christian Ørsted, the telegraph and radio without Maxwell and Hertz, artificial manures without Liebig, synthetic dye without Hoffman and Perkin. The work of these men and their peers gave to the industrial revolution, then already in progress, the scientific dimension the immense potentialities of which the author of the novel *Coningsby* had seen prophetically foreboded in the bustling life of a Lancashire town.

The new industrial developments also had political implications.

They made the rest of the world dependent upon the technological superiority of Europe and the United States of America. But above all they effected enormous changes in the consumption patterns of people in the Western countries. Their material standard of living was steadily raised and the rise affected ever larger segments of their populations.

Science itself could not stay aloof from these developments—leaving industry to pick up whatever fruits happened to fall from the Tree of Knowledge. The new relationship between science and industry had repercussions on both parties. The ensuing changes could be described as the integration of science into the economy of industrialized societies. That the process should have come about is most natural. What is a little surprising is that it started relatively late and was in full swing only in the second half of our century. To this slowness contributed perhaps a deep-rooted sentiment—inherited from our Greek forbears—of science as an elitist preoccupation detached from practical concerns. Another reason may have been an inherent demand on the part of science for freedom and independence for work, the practical implications of which cannot easily be predicted and often reveal themselves only after a long lapse of time. The shortening of this time-lag between new knowledge and technical innovation has become something of a problem for contemporary science policy.

With the slowness of the integrative process may be contrasted the rapidity of the changes in industrial production, once a technological breakthrough has occurred. The efficiency and usefulness of new commodities soon make earlier products with a similar purpose outmoded. At the same time the cost of manufacturing them tends to diminish, making the goods available to an increasing number of buyers/consumers. The best example is perhaps the development of the computer. The first commercial computers of not more than a quarter of a century ago were the size of a room and yet had a capacity which appears almost ridiculously small in comparison with that of the personal computers which many of us now carry in a handbag or even in the pocket.

As a consequence of this flexibility of new technologies, the research which propels their development has come to hold a pivotal position in the competition for markets by the producers. To keep abreast with advances in science and technology is vitally necessary both for the industrial enterprizes and for the national states themselves.

At the same time as the cost of production goes down under the joint pressure of technological advance and economic competition,

the cost of research increases. Advanced research in some branches of science tends to become exorbitantly expensive. National resources may not suffice for its upkeep. Joint ventures in science become increasingly necessary between nations. In a 'parallel' process industries transcend the national borders, forcing the political leadership to smooth out and relax the legal ties which constrain the market. The very notion of a sovereign national state is in the melting pot—and imaginative minds may even speculate about its gradual withering away. The integration of Europe is ominous of this possibility. But it is good to remember that it is only a geographically bounded instance of a global process, which consists in the integration of science and economy into something which may be called a techno-system, which determines the future patterns of life on the planet. Under the unifying network of this system great changes also in its cultural and political substructures can be expected to occur.

7

In mediaeval times learned men earned their living by training others in the professions for which intellectual schooling was needed. The professions were those of priest and lawyer and medical doctor. The training took place in collegiate units out of which emerged with time the unique institution of combined research and teaching which is the University. Here the implanting and search for knowledge was initially ruled by what I called the authority of the Word: Holy Scripture and 'canonized' ancient writers.

The 'scientific revolution' of the late Renaissance and Baroque periods was an upheaval against this state of affairs. As a consequence, the universities declined and even fell into disrepute. The Academies took over as fountainheads of the new scientific knowledge. The Academy presided over by Linnaeus and later by Berzelius is as good an example of this as any.

Only after the new science had secured its freedom from the tutelage of the external authority of Church and State was it time for the universities to revive. The Humboldt University of Berlin became in many European countries what Paris had been some 600 years earlier: a model to be imitated. It can be said to reflect the idea that scientific study is a value in itself, a constituent of that which the Germans with a term difficult to translate call the *Bildung* of a person. This view of the value of science and the task of the university belongs essentially to the 19th century. The integration

of science in the economy which is in progress has changed the picture. The ideals of the Humboldt University appear more and more as a pastoral dream of bygone days.

The University as institution is again in a state of crisis. Science seeks refuge in special institutes for 'advanced study' or is absorbed into the research laboratories of industries. It is true that basic research still holds a prominent place in the universities—and the educational philosophy in support of this state of affairs can argue its case with force. But, there is also a growing demand for university services from industries. In a reciprocal move, expensive research projects in physics or medicine or environmental study turn to industries for financial support. The traditional divide between pure and applied science is blurred and tends to lose its meaning. In fact, several of the most consequential advances in science in our century originated in the research laboratories of big industrial enterprizes—Bell and IBM to mention only two of the most spectacular examples.

It goes without saying that the fusion of basic science with technological development work also influences the direction of research. When the science policy of states to an increasing degree is geared to the ends of economic growth and sustained competitive power, research is forced to orient itself in the direction which will best promote these objectives. Thereby, science as the prime mover of societal developments runs the risk of becoming an auxiliary force steered not so much by pure intellectual curiosity about truth as by the cravings for continued advance on the road towards the earthly paradise where Bacon and his spiritual kinsmen promised —a little lightheartedly perhaps—that its technological orientation would take us. The changed rôle of science from an *ancilla theologiae* in mediaeval universities to an *ancilla industriae* in the research laboratories of modern companies cannot fail to have far-reaching implications. A new situation is about to arise, and science has reason to rethink the problem of its own legitimation.

8

Originally, man's dominion over nature was 'by the grace of God'. This made man accountable for how he used his privilege. What man does to nature must not conflict with the standards of good and evil set by divine authority. But what if this authority was shaken, man ceased to be the vassal of God? Then he could make himself 'Lord and Commander of the Elements'—as Mephisto

whispers to Doctor Faustus in Christopher Marlowe's drama. This is, in fact, what has happened under the eroding influence on religion of secularized institutions and rationally enlightened opinions.

As long as a culture or human community acknowledges a source of legitimacy for its shared values, the question of acceptance of those values does not arise. This was, by and large, the case as long as Christian religion set the standards of valuation in matters of proper behaviour. But with the loss of authority in matters of truth, the authority of religion also in questions of value became the object of critical doubts. Western philosophy after the Renaissance has been in search of a new ground for morality. As in science, and inspired by its example, this ground was sought in reason too. But unlike the search for truth by science, the search for new values has not been very successful. With time it has tended to the view that value-judgements, as distinct from factual ones, are mere expressions of emotive attitudes reflecting the likes and dislikes, the ambitions and lust of human individuals or groups.

The erosion of the traditional basis of values in religion and the futility of the efforts to establish a new one in reason, in combination with the overpowering enhancement of the instrumental value of science, has tended to remove altogether from the sphere of rational thought questions relating to moral and other forms of what philosophers call intrinsic value. A state of value-vacuum or even value-nihilism has come to prevail. It can be regarded as the deepest source of the confusions and uncertainties which are characteristic of the present cultural situation.

Symptomatic of this state is also the resurgence of new forms of fundamentalism. Some of them are of Christian inspiration. Others seek in ancient Oriental wisdom a cure for the inquietude of the Western mind. Some are purely escapist and narcissist. Others look forward to a New Age of mutual aid and loving brotherhood of all men.

Among these fundamentalist creeds I would also classify the attitude called scientism. It is the belief that science and technology by themselves can solve the problems for which their advancement is to a great extent responsible and adjust us to the life-style of a new era in the history of mankind. The rational faculty of man which made him the measure of all things will eventually also make him Lord of his own destiny. But, if the rational faculty is shrunk and limited to the instrumental value-dimension of science and technology, I think this belief is a serious illusion.

9

Early technology, on the whole, did not generate unintended side-effects which were harmful or otherwise a cause of concern. Technical constructions could misfire: a ship sink or a bridge collapse or a steam engine burst. But such undesired consequences did not affect either the human or the physical environment much beyond the immediate range of the constructions themselves.

The intrinsically beneficial and therefore reasonable ends which preindustrial technics served, in combination with the relative absence of harmful side-effects, prevented doubt about the uses of science for technological purposes arising. This state continued long after the eroding effects of scientific rationality on the value-basis of Western civilization had, in the 19th century, begun to worry philosophers and moralists.

The situation changed when science, through technology, became allied with the new industrial mode of production. What caused concern was, to begin with, the social impact of industry on those people who were involved in the production process themselves. In marxist terminology, the problem was how to adjust the productive relations in industrialized society to the productive forces which science and technology had released. In the Western countries the adjustment process was sometimes painful, but on the whole successful, and did not assume the dramatic forms envisaged for it by Marx and Engels. Its fighting corps was the labour movement and its crowning achievement the modern welfare state.

Man's adjustment to changed social conditions may in the end turn out to have been easier than the preservation of his continued dominion of nature. The difficulties here are too well known to deserve more than a cursory mention.

The increase in number of people who share the cake of material goods provided by industry, and the much greater, uncontrolled, increase in the number of those who are still looking forward to their share in it has created a load which nature may not be able to support. Hardly a day passes when we are not reminded of disaster due to pollution or poisoning of air and water, of famine caused by spreading erosion, of progressive impoverishment of the genetic variety in the animal and plant kingdoms. Nonrenewable resources are threatened with depletion and improved technology may not, in the end, be able to meet growing demands on energy supply without exposing man to risks which he is no longer willing to take. We feel relieved by the temporal reduction of nuclear danger thanks to mutual agreements between those who have the greatest

capability of letting the tempest loose. But it is good to remember that the potential threat of those and other lethal weapons will stay with us for the rest of the history of mankind.

In addition to these so to speak terrestrial warnings to our technological form of life there are what may be called the cosmic threats to the future of the globe presented by the diminution of the ozone layer and by the greenhouse effect. The fact that their causes are a matter of dispute and their future course difficult to predict may nourish neglect to react, in time, to the evil they produce.

It is no exaggeration to view ongoing technological and industrial developments—or better, the unintended consequences of these developments—as a potential threat to the survival of man as a species. This is now commonly recognized also within the scientific community. Voices of alarm are heard from it with increasing frequency and intensity.

Species originate and pass away. Man, surely, is no exception to this 'law of nature'. The thought does not make us uneasy when the end can be contemplated in the perspective of hundreds of millions of years. But it becomes terrifying when we realize that it may be much nearer; that if not we ourselves so our great-grandchildren a century or two ahead may be the last men.

Cataclysms have occurred before in the history of the earth. Distant memories of them survive in old mythology. Some may even have had destructive effects on life comparable to those of an imagined 'nuclear winter'. But there is an important difference. Past catastrophes of global dimensions were not caused by the species themselves for whose life they may have been fatal—but by uncontrollable external forces. The uniqueness of the present situation lies in the fact that the threats to man's continued existence have been conjured up by man himself.

In this one may see something hopeful. If man is a threat to himself he may also be able to rescue himself by taking appropriate measures or by changing his way of life. Unless, of course, it turns out to be too late, for reasons of natural law, to reverse the destructive processes called forth by him. Or unless his biological equipment turns out to be such that he lacks the innate steering mechanisms needed for correcting his courses on the road where science and technology has set him. These possibilities too have to be taken into account.

10

To make science responsible for the predicament in which mankind finds itself is, in the first instance, only to acknowledge the importance which science thanks to its technological orientation has had for the changes, for good and for bad, in the conditions under which men live. I think the attribution to science of the rôle of prime mover of these societal developments is correct; but does it also carry moral implications for science?

There has been a tendency among scientists to wash their hands when faced with the question. Scientific research is one thing, its technological applications another. The first is an intrinsically valuable activity; the second is good or evil depending on goals in the choice of which the scientists need not be, and in most cases probably are not, directly involved. Or their involvement is restricted to giving expert opinions on the instrumental value of their knowledge for purposes extraneous to their work as scientists.

This, however, is not enough to free scientists from moral coresponsibility for the uses of science. The inventor of a deadly weapon cannot rid himself of responsibility for its use by claiming that he had no intention to kill. He may even be willing to shoulder responsibility for its use—as in the case of war. Those who were instrumental in constructing the first atomic bomb thought they were working for the good, even for the good of humanity. Only when the enthusiasm at their success had cooled down, did the afterthought dawn upon some of them that they may, in the remoter perspective, have opened the gateway to evils which would contaminate their work as scientists and technicians. We remember Leo Szilard's words that the bomb killed a beautiful science. The bomb did not stop physics, nor were the reflective scientist's words meant as a suggestion that this should happen. But they have an ominous ring for all of science and their deeper meaning commands lasting attention. If a team of geneticists were to produce, at the request of their employers in a state of emergency, a helper which turned out to be Frankenstein's monster, they would have similar reasons for thinking that they had killed another beautiful science.

However steadfastly we may stick to the intrinsic worth of scientific knowledge, its pursuit is not an innocent game. It would be this only if science had no instrumental value at all. The mere fact that it has maculates its innocence, and the greater this value grows, the greater becomes the scientists' moral involvement in the uses of science.

I shall not discuss here what could be the practical implications

of this. One thing seems clear: No restrictions on the freedom of the scientific enterprize, whether imposed by mutual agreement among scientists themselves, or in the form of enacted legal constraints on their activity, could win the approval of an enlightened conscience. Things being such, restrictions would hardly be effective either. The only thing one can demand in the name of morality and reason is that scientists be aware of their responsibility and of the magnitude of the dangers to which the practising of their art has exposed us all. However, it must be left to the conscience of the individual scientist to decide what further conclusions to draw in view of the good and evil he is likely to promote by his efforts to find the truth.

In the longer time-perspective a development looms which may be worth considering. This is a loss of prestige for science due to the misuse made of it in technology—and a consequent weakening of the intellectual curiosity which is the psychological motor for the epistemic orientation of science. In order that this should happen, profound changes in prevailing climates of opinion would have to take place. There may in fact be some signs of this. For example, in the increasing rôle which new forms of art—often unrecognizable as such by a more tradition-bound taste—have come to play in the life of advanced industrial societies, particularly among the young. Whether these 'post-modern' signs are transient or of a more lasting influence is difficult to predict and futile to speculate about. But it is worthwhile remembering that everything in history is perishable and subject to change and that our Western-dominated and -inspired culture may one day find itself replaced by another which has little respect for and takes little interest in either science or technology. Whether people then would feel more relaxed, less insecure and worried about what may come than they do in our world is uncertain. The unresolved problems of their decomposed past would probably continue to torment them.

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Our legacy of Judeo-Christian values prevented us from seeking, like the Ancient Greeks, patterns for a reasonable arrangement of human affairs in the course of events in nature. Our Hellenic legacy of rational thought again voided the claims of the Christian Churches to authority in matters of truth. Thus, the tension between the two legacies has had a weakening influence on each of them. Value seemed exorcized from the sphere of reason, and rational thought from the sphere of valuations. Excessive sceptic-

ism about values has resulted in value-nihilism, and exaggerated faith in the power of reason has encouraged scientistic fundamentalism. The dialectic antagonism between the two cultural traditions which have nourished Western culture has in the end produced a cleavage which threatens it with chaos and decay.

The rift between fact and value which this antagonism has produced is something which intellectual honesty requires us to accept. But the narrowing of the range of reason which seemed to follow from this split is an illusion which must not be allowed to obscure our clearsightedness.

The striving for survival—the 'will to life' as Schopenhauer called it—is the biological, naturalistic basis of all evaluation. In the sub-human animal kingdom what we call evaluative activity simply is identical with this striving. Only at the human level does it take the form of judgements of good and bad articulated in a language.

An individual, even other than human, can seek the opposite of survival, which is death and destruction, for the sake of some further end. When it is sought for the sake of others of the kin it is self-sacrifice. This is not something we deem contrary to reason. We may even view it with admiration and approval. But striving for ends which will lead to the self-destruction of the species is exactly what we call irrational, contrary to reason. Considering its biological foundation we also call it perverse or contrary to nature. These are conceptual observations, neither evaluations nor scientific discoveries.

What is scientific, however, is insight into the natural conditions of human and animal survival, and therefore also into what we may and must not do to nature, if survival is to be secured. In this sense science may be said to investigate the margins within which life in accordance with reason will be possible. To overstep the margins is purposeless self-destruction, an irrational perversion.

One can therefore say that our Greek forbears were right when they saw in Nature ('Nature's Law') the supreme authority from which human doings derive their legitimacy. But their fanciful reading of the Book of Nature will not do for us. This is so because their science lacked the technological dimension the exploration of which has revealed and given us warning of the limits within which mortal man has to arrange his life.

The creation of an exact science of nature is without doubt the greatest contribution which Western civilization has made to history. It is, moreover, a contribution which unlike that of any civilization to art, religion, or philosophy, knows no boundaries of

language or tradition for its continued amelioration. We have no reason to think that further developments of science and technology will be a privilege of European culture or its off-shoots West and East of the continent. New people are entering the stage and may one day be leading in creative talent and innovative energies. Maybe their cultural legacies will be less contradiction-loaded than ours and therefore, let us hope, make it easier for them to respect the natural bounds which men must not transgress lest *nemesis* revenge their *hubris*.

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