Karl Jaspers and Karl Popper: the shared legacy

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Abstract
Jaspers and Popper have nothing in common beyond the legacy of Immanuel Kant’s philosophy. Popper dismisses Jaspers ‘existentialism’ as nihilistic and historicist; Jaspers never cites Popper. Jaspers describes Kant as ‘the philosopher for me’; Popper is an unorthodox Kantian whose critical rationalism put the finishing touch to Kant. For Kant, knowledge is not a simple copy of reality, but begins with reason’s questioning. Jaspers and Popper too insist that theory has priority over observation. For Jaspers, ‘there is already theory in every fact’; for Popper, ‘every statement has the character of a theory’. Science begins with metaphysical Ideas which become scientific when tested in experience. They differ in Popper’s rejection of induction in favour of falsification, while Jaspers tacitly accepts induction.

Keywords
Jaspers, Kant, legacy, Popper, psychopathology, theory and existentialism

Karl Jaspers was born in Oldenburg, Germany, in 1883. In his late teens he read Spinoza, although he had no intention of studying philosophy. He began studying law at university, switching to medicine. He took philosophy courses, but quickly dropped out, reporting that he did not understand Kant. After graduating in 1908, he worked as an unpaid assistant in the University of Heidelberg psychiatric hospital supervised by the neurohistologist, Franz Nissl. At this time, his thoughts were wholly occupied by science, and he was committed to a scientific psychiatry. He examined patients with newly introduced psychological tests, and measured blood pressure with von Recklinghausen’s apparatus; his results were never published. In 1911, he was commissioned to write a book on psychopathology. Allgemeine Psychopathologie (Jaspers, 1913) made his name as a psychiatrist. Science was a lifelong interest, addressed in almost all his books. Indeed, Jaspers is the only one of the so-called ‘existentialists’ for whom science was a dominant theme of their philosophizing. Of this enduring interest, he writes:

From adolescence, scientific insights have been an indispensable element of my life. I could not get enough of knowing what man knows, how he knows it, and the basis of that knowledge. This has remained with me all my life even though, in later years, I have had to be satisfied with reading scientific treatises from almost all fields of research. (JA: 30–1)
From reading Spinoza, Jaspers acquired philosophical insights which he knew were not scientifically valid because ‘the truly scientific is critical knowledge that knows its limits’. From this, he developed ‘an idea of philosophy as something totally different to science, with a claim to truth unknown to science, based on a justification alien to science, and the attainment of something inaccessible to any science’. The then current idea that philosophy could be scientific is ‘not to be a philosopher at all, but to practice philosophy like a physicist, the difference being that the fancy logical notions created are nothing but soap bubbles, while the physicist creates factual knowledge which confirms or refutes his speculations’ (JA: 31).

Jaspers met his wife-to-be, Gertrud Mayer, in 1907. She introduced him to Plato, and directed his interest towards philosophy. He took seminars on Kant with the neoKantian Emil Lask, and was particularly impressed by Kant’s theory of Ideas. In Philosophie, Jaspers (1932) gives a list of 10 thinkers influential in his philosophizing. It was unusual for thinkers of the time to spell out the influences on them; such influences were left unspoken. Jaspers concurs: ‘I rarely refer to them explicitly but I will record their illustrious names here’ (Ph1: 2). The list is in chronological order apart from Kant who appears first. Kant is ‘the ultimate philosopher, incomparable in the sheer nobility of his humanity as revealed in the purity and acuteness of his endlessly shifting thought’ (Ph1: 2). Nine years later, he writes: ‘Kant became the philosopher for me and has remained so’ (Jaspers, 1941/1951: 399, emphasis added). Then, in The Great Philosophers, he concludes: ‘Kant is the nodal point in modern philosophy … Kant is absolutely indispensable; without him there can be no critical basis for philosophy’ (Kt: 380–1). Jaspers’ philosophizing is a development of Kant’s theory of knowledge and critique of metaphysics. In his three-volume Philosophie, the three areas of Kantian metaphysics – Ideas of the world as a whole, the soul and God – become world orientation, elucidation of Existenz and transcendence. Jaspers was a fundamentally Kantian thinker.

Karl Popper was born in Vienna in 1902. In his teens he too read Spinoza, but found him arbitrary and pointless. Kant’s Kritik der reinen Vernunft (1781) was different, but too difficult. He was puzzled by the antinomies which posed contradictions with no obvious resolution, and the counterintuitive notion that reason can contradict itself. The thesis of the first antinomy suggests that the world has a beginning in time and is limited in space; the antithesis is that the world is infinite in both time and space. These were not arguments about words, they were real problems whose solution lay in science, not philosophy. Popper did not get the point, and it was not until he was an undergraduate that he picked up the Kritik again and started to fight his way through. Like Jaspers, he saw his philosophy as a development of Kant’s. Kant’s theory of knowledge was the prototype for his critical rationalism, and he was an ‘unorthodox Kantian’ (PA: 65) whose philosophy ‘puts the finishing touch to Kant’s own critical philosophy’ (CR: 27).

Popper objected to Kant’s view that science can arrive at valid a priori truth, that is, necessarily true and true for all time. Kant had been misled by the undeniable success of Newton’s theory. In the century from Newton’s Principia (1687) to the second edition of Kant’s (1787), Newton’s theory had been thoroughly tested and was apparently so well confirmed that ‘no qualified judge of the situation could doubt any longer that Newton’s theory was true’. The theory was ‘a unique event … an age old dream come true … [providing] real, certain, indubitable, and demonstrable knowledge’ (CR: 93). Newton’s theory was valid a priori. But, in 1905, a century after Kant’s death, Einstein showed that Newton’s theory was not valid a priori. In most situations, it was a good approximation, but when pushed to the limit it was false. This was Kant’s central mistake: scientific theories cannot be valid a priori. But, despite this reservation, Kant’s theory of knowledge was a great advance because it ‘contained the nucleus of a true philosophy of science’ (CR: 96).

This nucleus was Kant’s so-called Copernican revolution – his assertion that we should replace the assumption that ‘our knowledge must conform to objects’ with the contrary assumption that ‘objects must conform to our knowledge’. This would allow us ‘to have knowledge of objects a
priori, determining something in regard to them prior to their being given’ (B: xvi). In the
Prolegomena (1783), a summary of Kritik der reinen Vernunft published between the two editions,
Kant applies this Copernican principle to laws of nature such that ‘the universal laws of nature can
and must be cognized a priori … the Understanding does not draw its (a priori) laws from nature,
but prescribes them to it’ (Kant, 1783/1997: 73–4, his parenthesis). Then, in the second edition of
the Kritik, he contrasts reason’s ‘plan of its own’ with ‘accidental observations made in obedience
to no previously thought out plan’ (B: xiii). As a result:

A light broke upon all students of nature. They learned that reason has insight only into that which it
produces after a plan of its own, and it must not allow itself to be kept, as it were, in nature’s leading-
strings, but must itself show the way with principles of judgement based upon fixed laws, constraining
nature to give answer to questions of reason’s own determining. (B: xiii)

Kant cites Galileo’s balls running down an inclined plane, Torricelli’s column of water held in place
by air and Stahl’s phlogiston theory of metals and metal oxides; all relied on reason’s plan of its own
and the experiments designed to test the plan. In doing this, we are not listening to a teacher, but
consulting a judge ‘who compels the witnesses to answer questions which he himself has formulat-
ed’ (B: xiii). As a result, ‘the study of nature has entered on the secure path of a science, after
having for so many centuries been nothing but a process of merely random groping’ (B: xiv). For
Popper, Kant was correct in thinking that knowledge is not a copy or impression of reality. Reason
must put its own questions to nature: ‘we must confront nature with hypotheses and demand a reply
to our questions … [because] it is logically impossible to derive theories from observations’. The
alternative is ‘haphazard observations which follow no plan and which can never lead us to a natural
law’ (CR: 189). ‘It is our own intellect which imposes its laws upon nature’ (LSD: 79).

Popper thought that Kant was correct that knowledge is genetically and psychologically a priori,
but not that it is valid a priori; not even Newton’s laws are valid a priori. We must reject the notion
of a priori knowledge because ‘scientific theories are man-made, and we try to impose them on the
world’ (PA: 46). The reality is that ‘our intellect does not draw its laws from nature, but tries – with
varying degrees of success – to impose upon nature laws which it freely invents’ (CR: 191).
Theories are permanently open to refutation, and often wrong. They are not valid a priori because
it is the nature of science to revise and reject them. This rejection of science as valid a priori was
the finishing touch to Kant’s critical philosophy – Popper as an unorthodox Kantian.

Jaspers’ critique of Kant is similar (Kt). Kant claimed his philosophy was a science ‘with the same
universal validity as physics and mathematics’. He had set philosophy on ‘the sure path of science’,
and ‘he compared his new philosophical method with the leap that, in former times, had led from
multiple experiences to the science of mathematics and from many types of observation to modern
natural science’. This new science was comparable to ‘the experimental methods of the natural scien-
tist as when, through insight into the character of objects in space and time, the antinomies which
arise from our thinking about the world find their solution’. For Kant, the result was ‘fundamental a
priori knowledge in the natural sciences’ because ‘we can only call science true science if it has apo-
dictic certainty’; and ‘metaphysics must be a science, otherwise it is nothing’ (Kt: 362–3).

For Jaspers, as for Popper, apodictic or a priori certainty in science is impossible. He too cites
Newton, noting that ‘today, we have a more comprehensive physics of which Newton’s is just one
element’ (Kt: 368). Science offers ‘methodical, universally valid and compelling knowledge of
particular objects’ (Kt: 365). Kant’s philosophy may be methodical, but it is not universally valid
in the manner of scientific knowledge, and his claim that philosophy is scientific is untenable
because scientific knowledge cannot be valid a priori. Rather, science ‘achieves its validity within
the defineable domain of experience’ (Kt: 369).
**Popper and induction**

Despite acknowledging the need for reason to have a plan of its own, Kant did not renounce induction and, according to Popper, he ‘tried to force his way out of this difficulty by taking the principle of induction to be a priori valid’ (LSD: 29). In Popper’s lifetime, induction was promoted by the logical positivists of the Vienna Circle. Popper floated around the Circle, but was never a member. Otto Neurath, a leading member, described him as the official opposition. For the Circle, the meaning of a statement is the method of its verification; observation comes first, followed by induction as the supreme methodological principle, without which the truth of scientific propositions cannot be established. For Popper, induction is untenable; not even the perception of a glass of water is verified by observation because universals like glass and water ‘cannot be reduced to classes of experiences’ (LSD: 95). His *Logik der Forschung* (Popper, 1934) dealt with the same problems as the Circle – induction, confirmation, probability, the problems of quantum theory and the demarcation of science from metaphysics – while offering a devastating critique of induction and the priority of observation over theory. Popper saw his critique as ‘the result of having read Kant’ (PA: 65).

Popper agreed with the Vienna Circle that observation and experiment decide the truth or falsehood of scientific theories; but, in place of induction, he put falsification or refutation because knowledge progresses by ‘unjustified (and unjustifiable) anticipations, by guesses, by tentative solutions to our problems, by conjectures’ subjected to rigorous attempts at refutation (CR: vii). Should a theory survive refutation, Popper is prepared to say that ‘it has proved its mettle or that it is corroborated by past experience’ (LSD: 33). However, a positive result supports the theory only temporarily because further testing may refute it. Empirical evidence allows us to infer the falsehood of a theory, not its truth, and this inference is deductive. It is refutation or falsification, not confirmation or verification, which distinguishes science from non-science or metaphysics: ‘only if a theory successfully withstands the pressure of these attempted refutations can we claim that it is confirmed or corroborated by experience’ (CR: 256). This demarcation of science from non-science will not be sharp, but will have degrees. Some theories are more open to refutation than others; there will be well-testable, hardly testable and non-testable theories, the last being of no interest to science. The upshot is that scientific theories can never be definitively confirmed. Theories are not built on solid ground, but on a swamp into which we we sink piles not in a search for solid ground, but simply until ‘we are satisfied that the piles are firm enough to carry the structure, at least for the time being’ (LSD: 111).

**Popper on the priority of theory**

The view that science begins with observation followed by inductive inference was widely accepted, and Popper’s contrary view that beginning with observation is impossible met with incredulity. He recalls taunting his students, telling them ‘take pencil and paper; carefully observe and write down what you have observed’. The instruction is absurd because ‘the belief that we can start with pure observation alone without anything in the nature of a theory is absurd … Observation is always selective; it needs a chosen subject, a definite task, an interest, a point of view, a problem’ (CR: 46). Observation with no previously thought-out plan is not science. As Kant knew, the theoretician puts questions to the experimenter; the experimenter answers these questions, and we accept or reject the observation statement solely ‘on the occasion of applying a theory … an application which puts theory to the test’ (LSD: 106). The reality is that ‘We must give up the view that we are passive observers, waiting for nature to impress its regularity upon us. Instead we must adopt the view that in digesting our sense data we actively impress the order and the laws of our intellect upon them’ (CR: 180–1). Science demands a prior hypothesis or theory – reason’s ‘plan of
its own’ – because ‘theory dominates experimental work from initial planning up to the finishing touches’ (LSD: 107). Theory comes first because ‘without theories we cannot even begin, for we have nothing else to go by’ (PA: 46). Summarizing the priority of theory over observation, Popper asserts: ‘every statement has the character of a theory’ (LSD: 94–5).

Jaspers on the priority of theory

Facts are of central importance to science because ‘once gained, facts cannot be lost so long as reality does not change … Like rocks in an ebbing and flowing sea of possible knowledge, facts stand as the basis of objectivity, an objectivity that simply is’ (Ph1: 124). Just as Popper taunted his students with the absurd instruction to ‘observe’, so Jaspers insists that ‘facts can only be observed in definite categories and methods’ (GP: 17). He too dismisses blind observation as worthless because ‘blindly seeing facts as random perceptual contents leads to endlessness’. Facts only become significant in the light of some prior conjecture or theory because ‘the relevance of facts – and, very often, the discovery of facts – depends on theory’ (Ph1: 124). Facts depend on an underpinning theory because ‘we require a point of view which offers structure and method and which acts as a restraint on endlessness’ (GP: 31). Jaspers spells it out:

Facts need to be established, and this cannot be by observation alone, but rather through theorizing. It is consciousness of the method by which we become aware of them that is the critical test of whether and in what sense they count as factual. (Ph1: 124)

Fact and theory are interdependent: ‘what makes empirical research compelling is that theory is tied to the facts, and facts to the theory’ (Ph1: 125). Indeed, ‘the cogency of a theory depends on the facts and the more a theory brings heterogeneous facts together without being contradicted, the more compelling its truth; but no theory is final’ (Ph1: 124). In summary, ‘We need to become aware of what it is that presupposes all empirical facts; this is that: “there is already theory in every fact” (in jeder Tatsache schon die Theorie ist)’ (GP: 17; the final phrase is repeated at Ph1: 124). Theory and observation interact, and theory is permanently open to refutation by contrary facts. The same priority of theory is repeated in Vom Ursprung und Ziel der Geschichte: ‘there is a constant awareness of the underlying theory, that is of the presupposition that constitutes the point of departure for research’ (Jaspers, 1949/1953: 84).

For Jaspers, the natural sciences are the model for theorizing in general – sciences in whose theories ‘something with quantitative properties is thought of as underlying the phenomena’; he instances atoms, electrons and waves. The result is that ‘consequences are deduced from the theory, consequences whose truth is confirmed or refuted through experimental measurement’. He agrees with Popper that science is ‘a constant interchange between theory and the established facts; theory is fruitful because it leads to new facts, and theory is always dominant because all facts are subsumed within it’. Physics and chemistry are the exemplars of scientific theorizing; biological theories fall short of the paradigmatic natural sciences, but not by as far as psychopathology whose theories are ‘essentially different to natural scientific theories’ (GP: 547).

There are three reasons for psychopathology’s shortcomings. First, there is a marked difference in the ‘modes of verification and falsification’ of natural science and psychopathology. In psychopathology, theories are merely rough outlines drafted to accommodate the known facts, seek out further facts and offer a place for facts which will only become known in the future. But, unlike the natural sciences, psychopathology has ‘no systematic method by which it can assess all the facts or be on constant search for contrary instances’. Psychopathology can only offer groupings of facts analogous to a theory, and its theories play a different role from those of natural science. This is
because, second, ‘theories in psychopathology are not built one upon another, and they show no tendency to become ever more unified and closer to reality; it is much more that a theory is constructed and then forgotten altogether’. Third, psychopathology offers ‘a wide disparity of theories which have nothing in common’ (GP: 547). Psychopathology has biological, psychological and social theories; it is an explanatory (erklärend) natural science and an understanding (verstehend) human science. In summary:

Unlike the natural sciences, psychopathology has no true theories. In psychopathology, theories break down because they are illusory speculations about a would-be-reality, analogous to the theories of the natural sciences but, for the most part, lacking a clear logical method. (GP: 547)

A further similarity between Jaspers and Popper is that both reject theories purporting to explain everything. Both cite Freudian psychoanalysis, which immunized itself against refutation with a range of ad hoc hypotheses so that no fact could possibly refute the theory. Jaspers also instances theories of heredity in psychopathology which had become so malleable and all-embracing that there was no conceivable outcome the theory was unable to explain; as a result it was impossible to confirm or refute the theory:

In some forms of genetics as applied to psychiatry what began as significant knowledge led in the final analysis to endlessness because so many rules, possibilities and hypotheses, and so many possible, though arbitrary, genetic units had been developed that any instance could be accommodated however it presented, and no real case could refute the theory. But, if we can account for all possibilities, then we can neither confirm nor refute the theory; everything is possible, and nothing can be predicted. (Ph1: 129)

Both agree that science is ‘universally valid, compelling and based on methods which are explicit and could be verified by anyone’ (GP: 768). Where they differ is the possibility of the confirmation or verification of scientific theories. Jaspers argues that theories can be confirmed or verified by observation or experiment, thus tacitly accepting induction. Popper insists that, because confirmation and verification entail induction, theories cannot be confirmed or verified, only refuted or falsified. This is because ‘We question nature, as Kant taught us to do, and we try to elicit from her negative answers concerning the truth of our theories: we do not try to prove or verify them, but we test them by trying to disprove or falsify them, to refute them’ (CR: 192). Despite disagreeing on the possibility of confirming or verifying scientific theories, their agreement on the priority of theory over observation is striking, as outlined in Table 1.

Kant and regulative ideas

In Kant’s theory of knowledge, ‘just as the Understanding unifies the manifold in the object by means of concepts, so reason unifies the manifold of concepts by means of Ideas’ (A: 644; B: 672). The forms or categories of the Understanding constitute knowledge, but knowledge is constrained by the limits of experience and, beyond this limit, Ideas of reason regulate the search for knowledge. Ideas have a transcendent and an immanent use. In their transcendent use, Ideas step beyond experience resulting in speculative metaphysics – the world as a whole, the soul and God. This transcendent use is illusory: ‘all those conclusions of ours which profess to lead us beyond the field of possible experience are deceptive and without foundation’ (A: 642; B: 670). But in their immanent use, directed back at experience, Ideas ‘have an excellent, and indeed indispensably necessary, regulative employment’ (A: 644; B: 672). And in this regulative employment, Ideas are vital to the progress of science.
Kant instances Ideas of pure earth, pure water and pure air. These Ideas have no existence, but ‘we require the concepts of them in order properly to determine the share which each of the natural causes has in producing appearances’ (A: 646; B: 674). Ideas cannot constitute knowledge; rather, they have the regulative function of bringing unity and system to the rules of the Understanding; and ‘this unity … is a mere Idea’ (A: 652; B: 680). Ideas are templates or models we hold against reality to assess the degree to which real earth matches pure earth. As constitutive principles they may conflict, but when treated as regulative Ideas, there is no conflict because ‘the Idea is an heuristic, not an ostensive concept’ (A: 671; B: 699). In this regulative capacity ‘it goes far beyond what experience or observation can verify; and though not itself determining anything, serves to mark out the path towards systematic unity’ (A: 668; B: 696).

As further examples, Kant gives Ideas of nature versus nurture and early notions of evolution versus creation. Nature relies on heredity, nurture on external conditions; evolution relies on continuous gradation, creation on biblical doctrine. As constitutive principles proposing knowledge, they conflict, and there can be no resolution; but as regulative Ideas directing the search for knowledge they are complementary: ‘the twofold interest of reason’ (A: 667; B: 695). Kant’s conclusion is that:

The method of looking for order in nature in accordance with such a principle, and the maxim which prescribes that we regard such order as grounded in nature as such, is certainly a legitimate and excellent regulative principle. In this regulative capacity it goes far beyond what experience or observation can verify; and though not itself determining anything, serves to mark out the path towards systematic unity. (A: 668; B: 696)

Jaspers sees Kant’s teaching on Ideas as ‘one of the most profound and illuminating insights in philosophy’ (GP: 560,n). His main account is ‘Kants Ideenlehre’ (Kant’s Theory of Ideas), (Jaspers, 1919b), where he notes that knowledge reaches only as far as experience and, beyond this limit, we must look to Ideas which ‘have no intuition of their own because Ideas relate to the Understanding, and only through the Understanding to intuition’ (KI: 467). The transcendent use of Ideas means we become ‘entangled in paralogisms or logical fallacies and antinomies … or we employ fallacious arguments which draw conclusions about the existence of an object from the nature of a concept’ (KI: 465–6). The ontological argument for the existence of God is an example of the latter.

**Table 1. The priority of theory.**

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<tr>
<th>Popper</th>
<th>Jaspers</th>
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<td>• observation is always selective; it needs a chosen subject, a definite task, an interest, a point of view, a problem; &lt;br&gt;• the belief that we can start with observation without anything in the nature of a theory is absurd; &lt;br&gt;• we are not passive observers; rather we actively impress the order on the data; &lt;br&gt;• we accept or reject an observation statement solely on the occasion of applying a theory, an application which puts theory to the test; &lt;br&gt;• theory dominates experimental work from initial planning up to the finishing touches; &lt;br&gt;• without theories we cannot even begin, for we have nothing else to go by; &lt;br&gt;• every statement has the character of a theory.</td>
<td>• blindly seeing facts as random perceptual contents leads to endlessness; &lt;br&gt;• facts can only be observed in definite categories and methods; &lt;br&gt;• facts are not established by observation, but through theorizing; &lt;br&gt;• theory is tied to the facts, and facts to the theory; &lt;br&gt;• the relevance of facts depends on theory; &lt;br&gt;• consequences are deduced from the theory, consequences whose truth is confirmed or refuted through experimental measurement; &lt;br&gt;• theory is always dominant because all facts are subsumed within it; &lt;br&gt;• the underlying theory constitutes the point of departure for research; &lt;br&gt;• there is already theory in every fact.</td>
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Table 2 spells out the differences between the forms or categories of the Understanding as they apply to experience, and Ideas of reason as they extend beyond experience.

In *Philosophie*, Jaspers expands on the notion of Ideas. Ideas have no representation in the world; their role is to spur on and set the limits to knowledge, but they are not themselves an element of that knowledge. ‘Ideas cannot be verified directly; their verification is indirect in terms of their fertility in advancing our knowledge’ (Ph1: 141). Ideas are schemata, principles, provisional classifications, metaphors and images. He gives two examples: the Idea of a totality of the senses and the Periodic Table. The first has not proved valuable and has disappeared without trace. But the Periodic Table – the attempt to grasp the totality of chemical elements within one schema – remains a fruitful and productive Idea, offering a schema of all chemical elements, predicting their interactions and even the existence of elements as yet unknown. (Ph1: 142).

In his monograph, *Kant*, Jaspers returns to the same theme:

- Ideas give us the rules by which our knowledge advances. They do not give us the object of the Idea;
- Ideas are regulative principles by which knowledge progresses, not constitutive principles by means of which an object is constructed;
- The immanent employment of Ideas is essential to the systematic nature of scientific knowledge; the transcendent employment of Ideas is an illusion;
- Ideas do not apply to an intuition which belongs to them, but to the Understanding which gives form to intuition by means of its categories.
- (Kt: 282; my bullet points)

Ideas apply to psychopathology too. Where the cause is known (e.g. Down’s syndrome and Huntington’s disease), diagnosis is definite and based on constitutive forms of the Understanding. Where the cause is unknown (e.g schizophrenia and bipolar disorder), diagnosis is indefinite and based on regulative Ideas of reason. The significance for these uncertain diagnoses is that:

- the Idea of the disease entity can never be realized in any individual case …
- the true reality of the Idea of the disease entity is an Idea in Kant’s sense …
- the Idea of the disease entity is not a task which can be achieved but it does offer the most fruitful point of orientation …

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<tr>
<th>Forms or categories of the Understanding</th>
<th>Ideas of reason</th>
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<td>• the category faces intuition directly;</td>
<td>• the Idea is directly related only to concepts and to</td>
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<td>• the category finds its fulfilment in intuition;</td>
<td>judgements; the relation of the Idea to intuition is</td>
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<td>• the category can be precisely defined;</td>
<td>indirect, through such concepts and judgements;</td>
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<td>• the category is given;</td>
<td>• the Idea does not find its fulfilment in intuition;</td>
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<td>• the category is definite;</td>
<td>• the Idea extends beyond every conceivable limit;</td>
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<td>• the category provides us with the individual object of experience;</td>
<td>• the Idea is set up as a task;</td>
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<td>• the category alone and not the Idea results in objectivity.</td>
<td>• the Idea is indefinite;</td>
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<td>• the Idea provides us with the unity of experience;</td>
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<td>• the Idea points towards totality.</td>
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*I have broken up the passage.
• error begins to creep in when, instead of the Idea as illumination, we take the Idea to be an achievement, or when we take the concept of the disease entity to be a finished description …
• if the reader tries to grasp such a disease entity clearly and definitively then it just slips through his fingers.
• (GP: 569–70)

Ideas are crucial to the philosophies of science of both Popper and Jaspers.

**Popper and ideas in science**

Popper too makes extensive use of ideas because ‘metaphysical Ideas and problems have dominated the development of science for centuries as regulative ideas’ (CR: 159–60). Indeed, ‘scientific discovery is impossible without faith in ideas which are of a purely speculative kind, and sometimes even quite hazy’ (LSD: 38). Metaphysical Ideas are ‘primitive myths’ present in science from Ancient Greece right up to quantum theory (PA: 46). They are not knowledge, but they guide the search for knowledge. They are criticizable, but not falsifiable, and the development of science demands their elimination in favour of falsifiable hypotheses. Ideas give order to our picture of the world and, in some cases, even give rise to accurate predictions, but they only become scientific when they become falsifiable – when it is possible to decide empirically between them and some rival theory.

Popper’s main account of metaphysical ideas is in the *Postscripts* (Popper, 1982, 1983) to *The Logic of Scientific Discovery*. The Vienna Circle saw metaphysics as nonsense because it breaches the verifiability principle. For Popper, metaphysical ideas are unfalsifiable, but not nonsense: ‘I do not believe that metaphysics is nonsense, and I do not think it possible to eliminate all metaphysical elements from science; they are too closely interwoven with the rest.’ Nevertheless, it is the task of science to eliminate unfalsifiable metaphysical elements where possible ‘to increase the testability, or refutability, of the remaining theory’ (RAS: 179–80). The reality is that:

> In almost every phase of the development of science we are under the sway of metaphysical – that is, untestable – Ideas; Ideas which not only determine what problems of explanation we shall choose to attack, but also what kinds of answers we shall consider as fitting or satisfactory or acceptable, and as improvements of, or advances on, earlier answers. (QT: 161)

Ideas create the problem situation, direct the search for a solution and judge its success. They are implicit in, and intrinsic to, any scientific theory as ‘joint ancestors of all modern theories’; they are ‘metaphysical speculations … a metaphysical dream’ (QT: 171, 172, 177). Ideas lead to metaphysical research programmes: metaphysical because they are drawn from general views of the structure of the world; research programmes because they reflect the most pressing problems, and what a solution might look like. Metaphysical research programmes are ‘speculative physics’ or ‘speculative anticipations of testable theories’ (QT: 161–2). Popper gives a list of 10 metaphysical research programmes:

- **Parmenides’ Block Universe** – the world is one block; there is no void;
- **Atomism** – the world consists of atoms and the void;
- **Geometrization** – Plato’s cosmology based on geometry;
- **Essentialism** – Aristotle’s dualism of matter and form or essence;
- **Renaissance physics** (Copernicus, Bruno, Kepler, Galileo, Descartes) – largely a revival of Plato’s geometrical cosmology;
Clockwork Theory of the World (Hobbes, Descartes, Boyle) – physical causation is action at a distance;

Dynamism – Newton’s attractive and repulsive forces; Leibniz’s dynamical theory of matter;

Force Fields (Faraday, Maxwell) – matter is explicable in terms of fields of forces;

Unified Field Theory (Riemann, Einstein, Schrödinger) – gravitational and electromagnetic fields; matter is interconvertible with energy;

Quantum Theory – Heisenberg’s uncertainty principle; Bohr’s complementarity.

(precised from QT: 162–4)

All the above began as metaphysical Ideas from which falsifiable scientific hypotheses emerged. In each case, ‘a non-testable theory – a metaphysical theory – may be developed and strengthened until it becomes testable’. The contrast with the Vienna Circle is clear; for them, ‘metaphysics is mere meaningless gibberish’; but for Popper, ‘atomism is an excellent example of a non-testable metaphysical theory whose influence upon science has exceeded that of many testable scientific theories’ (RAS: 191–2).

Quantum theory offers further examples. Heisenberg’s uncertainty principle states that it is impossible to measure the position and momentum of an electron simultaneously. In Popper’s view, this is a ‘metaphysical picture of the physical world, whilst at the same time disclaiming metaphysics’, the result being ‘a curiously ambivalent obsession’. Heisenberg had a ‘preoccupation with killing the father – that is metaphysics – while keeping him inviolate in some other form, and beyond all criticism’ (LSD: 452–3). The father, killed but inviolate, was Einstein who was also critical of the uncertainty principle. In the same way, Bohr’s complementarity principle ‘renounces any attempt to go beyond the particle-wave dualism’ (QT: 199). Particles and waves are mutually contradictory, but together give an exhaustive account of the phenomena. Popper admits: ‘I could not persuade myself that I understood Bohr’s complementarity, and I began to doubt whether anybody else understood it’ (PA: 74).

As instrumentalists, Heisenberg and Bohr saw no reason to postulate hidden variables beneath the uncertainty and complementarity principles; both principles were already a true reflection of the nature of reality – scientific knowledge, not metaphysical Ideas. But for Popper, they were metaphysical research programmes, not falsifiable scientific theories. Both were based on thought experiments ranging far beyond the limits of experience; they were not a true representation of reality, but heuristic metaphysical pictures. Heisenberg and Bohr claimed to deal with appearances, but were secretly trying to catch the Kantian thing in itself. Popper does not object to metaphysics, but he does object to the ‘almost unconscious dissemination of this metaphysical picture, often combined with anti-metaphysical disclaimers’ – the implicit inclusion of metaphysics as science ‘unnoticed and thus uncriticized’ (LSD: 453). As heuristic models, metaphysical research programmes direct the search for knowledge but they are not knowledge in themselves. Unlike Heisenberg and Bohr, Popper was a realist for whom entities and processes beneath the theory do exist. He wants to go beneath the metaphysical Ideas of uncertainty and complementarity to the underpinning hidden variables: ‘to supplant, to supersede, the existing metaphysical interpretation of quantum theory … to supplant the instrumentalist interpretation’ (QT 199). In the event, Heisenberg’s and Bohr’s view – the so-called Copenhagen interpretation – has proved to be a powerful predictive tool, and remains the consensus among quantum theorists. But is it metaphysics?

Evolution is another example. Early in his career, Popper saw evolution as a metaphysical research programme, not a scientific theory, because adaptation, fitness and survival were tautological, the reality being that ‘if the species were not adapted, it would have been eliminated by natural selection. Similarly, if a species has been eliminated it must have been ill-adapted’. He
concludes: ‘there is hardly any possibility of testing a theory as feeble as this’ (PA: 137). Later, giving the example of penicillin resistance in bacteria, he renounces this view: ‘I have changed my mind about the testability and the logical status of the theory of natural selection; and I am glad to have an opportunity to make a recantation’ (Popper, 1978: 345). The mutation of bacteria to become penicillin-resistant is explained by natural selection; what began as a metaphysical research programme is now falsifiable; evolution has become a scientific hypothesis.

Metaphysical Ideas are a ‘dream programme … non-testable … [and] irrefutable’. But ‘if my dream is metaphysical, what is the use of it? Is there anything in it beyond, perhaps, an emotional satisfaction? Is it not utterly different from a scientific hypothesis?’. Answering his own questions: metaphysical theories are not fundamentally different to scientific theories: a metaphysical theory is ‘vaguer and inferior … and its irrefutability, or lack of testability, is its greatest vice’ (QT: 198–9). But as long as they can be criticized, Popper is prepared to allow their claim to be true, at least provisionally.

A metaphysical idea should be judged in terms of its ‘simplicity, coherence with other theories, unifying power, intuitive appeal and, above all, fruitfulness’. It should lead to new problems and offer new solutions to old problems. If it fails to do this then ‘I should discard it as a lovely dream – lovely, yet not to be indulged in’ (QT: 201). A metaphysical Idea is ‘a picture, a dream, rather than a testable theory’. Such pictures are important because they determine science’s problem situation and offer an overview of a possible solution: ‘a new picture, a new way of looking at things, a new interpretation’. These are ‘much needed tools of scientific discovery’ because falsifiable hypotheses may emerge from metaphysical pictures (QT: 210–11).

Metaphysical research programmes are ‘metaphysical or speculative physics rather than scientific physics’; they are ‘vast generalizations based upon various intuitive Ideas, most of which now strike us as mistaken’. But they have an indispensable role in the development of science. Initially untestable, they were ‘more of the nature of myths or of dreams than science, but they helped to give science its problems, its purposes and its inspiration’ (QT: 165). Ideas are like particles settling in layers at the bottom of a vessel, with each new layer corresponding to a theory more universal than the layers beneath it. However, ‘an Idea of this kind acquires scientific status only when it is presented in falsifiable form; that is to say, only when it has become possible to decide empirically between it and some rival theory’ (LSD: 278). Ideas are mythical and dream-like, but they inspire the development of falsifiable hypotheses, give direction to the search for knowledge, and unify our picture of the world.

**Jaspers and ideas in science**

Jaspers distinguishes scientific and philosophical world orientation; scientific world orientation is the search for valid knowledge; philosophical world orientation employs regulative Ideas that pose questions to scientific world orientation. As for Popper, ‘metaphysics has repeatedly been a sketch which has assisted at the birth of a scientific view of the world’ (Ph1: 159). Jaspers gives similar examples: Democritus’ atomism as the origin of natural science, Hegel’s dialectic as the origin of historical sciences, Kepler as the origin of astronomy, Fechner as the origin of psychophysics.

On each occasion, scientific thinking broke away from its metaphysical roots. What had been a metaphysical sketch of real existence and had been taken as such, gave way to a scientific hypothesis as a possible way of thinking. Thus, purified of all metaphysics, and with further verification, it develops into a fruitful scientific theory. Out of these metaphysical impulses, scientific categories and modes of thinking are created. At first, these concepts are, as it were, the music of metaphysics but then, stripped of their metaphysical meaning, they become the fruitful methods of science. (Ph1: 159)
Science begins with just such metaphysical impulses from which scientific hypotheses are drawn because ‘a scientific hypothesis is entirely distinct from its metaphysical meaning’; and it is the task of science to ‘free itself of all magical influences’. It is this development of science out of metaphysics which allowed medicine to discard ‘mythical terms’ in favour of scientific medicine (Ph1: 159). But this is not say that metaphysics is entirely without a role because ‘the philosophical basis of pure world orientation as a scientific enterprise is to be found in its metaphysical impulses’, and metaphysics retains the dual role of distinguishing knowledge from non-knowledge and attempting to define the unity of knowledge. In essence, ‘purifying science of metaphysics does not eliminate these metaphysical impulses; the act of purification merely adds to the certainty of our knowledge’ (Ph1: 160). This is because ‘Metaphysics stands behind our desire to know; metaphysics binds knowledge together in the unity of the sciences, and it is metaphysics which takes us to the limit of knowledge – the limit at which we are able to distinguish knowledge from non-knowledge’ (Ph1: 160). Jaspers’ employment of Ideas is identical to Popper’s metaphysical Ideas. Science begins with Ideas – Ideas that can be criticized, but not verified or falsified:

- Ideas cannot be verified directly. Their verification is indirect in terms of their fertility in advancing our knowledge. Such advances are expressed as schemata and principles … as provisional classifications … as metaphors and images …
- Ideas have no representation in the world … they can never have an object in the world.
- Ideas spur on and set the limits to our knowledge but they are not themselves an element of that knowledge.
- (Ph1: 141)

The impact of this is that two seemingly contradictory theses characterize the relationship of science and metaphysics:

- science gains its meaning from metaphysics, (but)
- true science contains no metaphysics. (Ph1: 161)

The contradiction is merely apparent: science gains its meaning from metaphysics because ‘metaphysics distinguishes the essential from the non-essential, and gives science its drive and goal, but metaphysics cannot be science’; and true science contains no metaphysics because ‘science is compelling, but the validity of its proofs, methods and results are independent of metaphysics’. The two are perfectly compatible because while ‘scientific world orientation arises from metaphysics and is permanently indebted to metaphysics, world orientation can only become and remain scientific if metaphysical elements are eliminated’. This is because ‘it is the essence of world orientation that its mythical meaning can never be demonstrated objectively. The objectively demonstrable is solely for consciousness as such2 while the mythical is accessible only to Existenz3 (Ph1: 161).

The human sciences are different from the natural sciences. In human science, research typically remains at the level of Ideas. In Jaspers’ words, ‘in the human sciences, it is Ideas themselves which are the object of empirical research’ (Ph1: 142). Popper agrees: Wilhelm Wundt’s experimental introspectionism, the theory that all experiences are composed of sense data, is ‘a kind of psychological atomism’ (RAS: 193). Few falsifiable hypotheses have spun off from metaphysical Ideas in the human sciences, leaving them criticizable but unfalsifiable. Psychoanalysis began as a metaphysical research programme and, armed with an ad hoc array of immunizing hypotheses, avoided any possibility of falsification – a metaphysical programme which both Jaspers and Popper saw as almost certainly false.

Table 3 summarizes Popper’s and Jaspers’ views of Ideas in science.
Popper and ‘existentialism’

Popper’s account of existentialism acknowledges his debt to Aurel Kolnai’s *The War against the West* (1938), a polemic against the rising tide of Nazi philosophy. Kolnai notes Heidegger’s appointment to the Rectorship of the University of Freiberg in 1933 and the enjoinder in his rectoral address that philosophy should be committed to the ‘nation’s spiritual mission’. Kolnai (1938: 312–13) concludes that ‘Heidegger is nothing but the inner flag of totalitarian militarism’ – a philosophical apologist for the Third Reich. Jaspers fares little better, although Kolnai does not charge him with complicity with Nazism. He describes Jaspers as ‘the most original philosophic mind’; then, two pages later, says of Jaspers’ philosophy that ‘a more horrible negation of the spiritual essence of man could not have been thought of’ (pp. 207, 209). Heidegger and Jaspers are from the same mould, but Jaspers is ‘Heidegger’s lesser brother’ (p. 282).

The real difference was that Jaspers recognized the likely impact of Hitler’s rise to power and, from this recognition, he and Heidegger acted very differently. As a mounting literature has shown, Heidegger was at best passively compliant with the Third Reich, and at worst, actively involved. In contrast, Jaspers was an opponent who, because of his critical attitude and Jewish wife, was stripped of his university position, forced into hiding, had a suicide pact with his wife should either of them be taken, and, at the liberation of Heidelberg in April 1945, escaped proposed transfer to the camps by just a few days. By any standard, Jaspers had a ‘good’ war. After the war, he was approached by the denazification committee for his view on what should happen to Heidegger. He recommended that Heidegger be banned from university teaching. Popper, himself Jewish in origin, was forced out of Germany to New Zealand. *The Open Society* was his ‘war effort’ (PA: 91).

Jaspers never cites Popper, and the only occasion on which Popper discusses Jaspers is a single passage of *Open Society* where he dismisses his ‘existentialism’ – a designation Jaspers never accepted – as nihilistic and historicist. Heidegger is dismissed as nihilistic too, having resurrected Hegel’s notion of nothingness – a meaningless term to Popper – as ‘a practical Philosophy of Life or Existence’ (OS: 76). For Popper, ‘Heidegger recognizes that his sentences are meaningless’; then – tongue-in-cheek – ‘a kind of philosophy which admits that it talks nonsense – but deeply significant nonsense’ (OS: 316,n87).

Popper thought Kolnai’s stigmatizing of Jaspers as Heidegger’s lesser brother was unreasonable because ‘Jaspers’ world-views were far advanced before Heidegger took to writing’. Jaspers had published two books, *Allgemeine Psychopathologie* and *Psychologie der Weltanschauungen* in 1913 and 1919, years before Heidegger’s *Sein und Zeit* (1927). Jaspers’ books made the drift of his thinking clear, and Popper even manages something of a compliment for Jaspers’ scientific work: ‘as opposed to Heidegger, Jaspers has undoubtedly written books which contain much of interest, even books that contain much that is based on experience’ (OS: 317,n89). Popper cites
Allgemeine Psychopathologie, but shows no appreciation of the importance that science had for Jaspers’ thinking.

Overall, Jaspers’ philosophy fares even worse than Heidegger’s deeply significant nonsense because, in Popper’s opinion, he is more historicist and nihilistic. He is historicist because he ‘carries the historicist idea of change and destiny recklessly to its most gloomy extreme. All things must perish; everything ends in failure’. He is nihilistic because:

only when faced with Nothingness, with annihilation, will you be able to experience and appreciate Existence. In order to live in the essential sense, one must live in crisis … Only in the marginal situations, on the edge between existence and nothingness, do we really live … you cannot taste life without tasting failure. (OS: 78).

But Jaspers was not a historicist: he did not believe it is the function of history to trace man’s inevitable path towards absolute spirit (Hegel) or dictatorship of the proletariat (Marx). Nor was he nihilistic: he was not concerned with nothingness, annihilation or destruction.

Popper’s fundamental mistake in his account of existentialism was his failure to see that Existence has a very different meaning for Jaspers and Heidegger. For Heidegger (1927), Existence is Dasein – the basic concept of his philosophy. Dasein is literally ‘being-there’, but refers exclusively to human existence. For Jaspers, Dasein is simply the ‘thereness’ possessed by everyday objects and by ourselves as biological, psychological and social beings. Unlike Heidegger, for Jaspers our existence extends beyond Dasein as ‘thereness’ to consciousness as such, to spirit, our drive for wholeness and unity, and finally, to Existenz, our connection to transcendence. Dasein, consciousness as such and spirit are the immanent modes of our existence, Existenz the transcendent mode.

The Existence Popper attributes to Jaspers is Existenz, a concept as central to Jaspers’ philosophy as Dasein is to Heidegger’s. Jaspers drew Existenz from the Danish philosopher and committed Christian Soren Kierkegaard. But, for Jaspers, ‘the mythical terms, soul and God’ become ‘the philosophical terms, Existenz and transcendence’. Also, ‘these are not knowable in the same sense as things in the world because they are of a different kind; but, while not being knowable, they are not nothing because they can be thought’ (Ph2: 3). Existenz for Jaspers entails transcendence because ‘only when grounded in transcendence is Existenz possible’ (Ph3: 6). This is because ‘it is only at the boundary of what can be known empirically by consciousness as such that Existenz can get a sense of the real being of transcendence’ (Ph3: 9). As guiding lights or signposts to transcendence, we must rely on ciphers that are non-objective, veiled, intuitive and evanescent symbols. Jaspers sees his own self as precisely this Existenz, and he feels more deeply rooted in Existenz than when he tries to grasp himself objectively as disposition or character: ‘what I am depends on the possibilities of Existenz, and it is only as I realize the possibilities of Existenz that I become myself’ (Ph2: 3). As Existenz, he knows himself to be autonomous even though he is unable to define his own self. If he tries to define Existenz as a psychological object, it will vanish because its inner character cannot be examined.

Popper is correct that marginal or ultimate situations are crucial to Jaspers’ philosophy; Popper chooses strife as his example: ‘strife is a fundamental factor of our Existence, but man fails to understand that strife is an ultimate’ (OS: 317,n89). In Psychologie der Weltanschauungen, Jaspers’ examples are strife, chance, guilt and death; in Philosophie, suffering replaces chance. The reality is that ‘I cannot live without strife and suffering; I have to accept guilt as unavoidable; and I must die’. Ultimate situations are ‘a wall we bump into, a wall against which we founder; they cannot be changed; all we can do is become aware of
them … they are part of our very existence’ (Ph2: 178). We access ultimate situations through Existenz because the reality of ultimate situations is known only to Existenz. Everyday situations become ultimate situations through a unique transposition by which Existenz makes its appearance, such that ‘the experience of ultimate situations and Existenz is the same … and the true function of the ultimate situation is that, although immanent, they point to transcendence’ (Ph2: 179). Ultimate situations are not ‘particular situations in a finite sense; rather I grasp them as Existenz in an infinite sense … they are the leap in which Existenz becomes real’ (Ph2: 181). In every ultimate situation, the ground is pulled from beneath our feet; there is no solid foundation. What they have in common is that ‘an antinomy underlies each of them … strife and mutual aid, life and death, chance and certainty, guilt and innocence are each bound up with one another; one cannot exist without the other’ (PW: 256). Popper was correct that Jaspers’ ultimate situations are negative, but they are not reflections of nothingness. Rather, the ultimate situations of strife, chance, suffering, guilt and death are ways in which Existenz touches transcendence. But if you want to touch transcendence get a grand-child; the enthusiasm, mischievousness and humour are positive ultimate situations stretching beyond everyday experience. Karl and Gertrud were childless.

Popper had no interest in transcendence because, as for Kant, ‘human reason is incapable of grasping or knowing the world of things in themselves … We can only use irrational or supra-rational means, such as instinct, poetic inspiration, moods or emotions’ (CR: 193). But for Kant, although reason is incapable of knowing the thing in itself, it is quite capable of thinking the thing in itself. I cannot know that the world is infinite, that the soul is a simple, indivisible substance, that I can act free of causal laws or that there is a God, but I can think these things. This is the essence of Kantian Ideas in the antinomies that baffled Popper as a teenager.

Bryan Magee, Popper’s friend of 30 years and one of his most sympathetic commentators, had a compelling interest in transcendence, spurred on by a combination of his pressing – though he admits hopeless – interest in personal survival after death and philosophical interest in Kant and Schopenhauer. He recalls trying to persuade Popper to turn his considerable powers to the transcendent; he was unsuccessful. Popper had no doubt that there was ‘something’ beyond the bounds of experience but, as Kant had asserted, that ‘something’ is unknowable. This was a problem Popper felt he had no hope of solving and, for that reason, he would not give it his attention. On metaphysical questions: ‘the meaning of life as a whole, the meaning of death, morality, values, the significance of art’ – very Jaspersian questions – Magee (1997: 248) continues:

Popper has not written about them, or at any rate not very much. Their supreme importance for us is something he not only conceded but asserted, and he was dismissive of so-called philosophers who denied their philosophical significance. Other philosophers, he said, might very well have something new and important to say about them: the only thing was, he did not.

For Popper, Jaspers’ philosophy is ‘hysterical romanticism combined with brutal barbarism and professional pedantry’ (OS: 317,n89; repeated at CR: 357). This is ‘the philosophy of the gambler, of the gangster’, and Jaspers’ nihilism condemns him to membership of ‘an esoteric group of intellectuals who have surrendered their reason, and with it, their humanity’ (OS: 78). It is fair comment that Jaspers can be pedantic; what major philosopher is not? Popper perhaps, all of whose work after Logik der Forschung was written in English, not his first language! Popper is generally dismissive of existentialists: ‘I can only pity them; they must be blind and deaf, poor things’ (CR: 194). But Jaspers was not philosophically blind or deaf, nor was he a hysterical romantic, nihilist, historicist, barbarian, gambler or gangster. Popper is being gratuitously
offensive to a philosophy with a different aim from his own, for which he had neither knowledge nor feel. It is unfortunate that his critique relied so heavily on Kolnai’s partisan work, because neither do justice to Jaspers’ philosophy.

**Conclusion**

As teenagers, Jaspers and Popper cut their philosophical milk teeth on Spinoza before moving on to Kant, who both initially found too difficult. Later, having mastered Kant, both agreed that knowledge is not a simple copy of reality, but must begin with reason’s questioning. Blind observation is worthless; facts cannot be established by observation alone, only through theorizing. This is because facts must be observed in definite categories which necessarily involve theory. Only in this way do observations become facts. Theory is tied to facts, and facts to theory; and theory has priority over observation. Their agreement is illustrated in Jaspers’ assertion that ‘there is already theory in every fact’ – a clear echo of Popper’s ‘every statement has the character of a theory’. Both also agree that science begins with regulative Ideas of reason – with metaphysical Ideas as primitive myths, pictures, dreams, sketches, music and mythical meaning. Where they disagree is Popper’s insistence on falsification alone in science, while Jaspers thinks confirmation and verification are possible.

Jaspers and Popper share a legacy in the philosophy of Kant. Popper saw himself as an unorthodox Kantian whose critical rationalism put the finishing touch to Kant’s theory of knowledge. Late in his life, Jaspers was described by a University of Basel colleague as ‘the first and last Kantian’ (Ehrlich, 1975: 211). Jaspers was more Kantian than Kant.

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**Notes**

1. I have made the translations from the German texts (but I also give citations to published translations, where available); the exception is Kant’s *Critique of Pure Reason* for which I employ Kemp Smith’s translation. In quasi-German mode, I capitalize two nouns: Ideas (*Ideen*) to distinguish it from idea or representation (*Vorstellung*), and Understanding (*Verstand*) to distinguish it from empathic understanding (*Verstehen*). I retain Jaspers’ ‘Existenz.

The following abbreviations are used for the most frequently cited references:

**Kant:**

A, B: the two editions of *Critique of Pure Reason* (1781, 1787/1933)

**Jaspers:**

GP is *General Psychopathology* (1959/1963)

JA is Jaspers’ ‘Autobiography’ (1957b)

KI is ‘Kants Ideenlehre’ (1919b; appendix to PW)

Kt is *Kant from The Great Philosophers* (1957a/1962)

Ph1, Ph2, Ph3 are the three volumes of *Philosophy* (1932/1969)

PW is *Psychologie der Weltanschauungen* (1919a)

**Popper:**

CR is *Conjectures and Refutations* (1963)

LSD is *The Logic of Scientific Discovery* (1934/1959)

OS is *The Open Society and its Enemies, Vol. 2: Hegel and Marx* (1945)

PA is Popper’s *Autobiography* (1974)

QT is *Quantum Theory and the Schism in Physics* (1982)

RAS is *Realism and the Aim of Science* (1983)
2. Consciousness as such (Bewußtsein überhaupt) is Kant’s Understanding, the universal premise of all knowledge; Kant occasionally uses the term (A: 176; B: 217).

3. Existenz broadly means human freedom (see later).

References


