

**The basic ideas of Friesean philosophy in
relation to contemporary science
(1930)**

**Die Grundgedanken der Fries'schen Philosophie in
ihrem Verhältniss zum heutigen Stand der
Wissenschaft.**

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Dear colleagues. Having the honor to speak in the context of a meeting devoted to the memory of Leonard Nelson, I would first like to briefly set forth the purpose of my presentation.

Nelson was appointed head of his school not only because of the sharpness of his thought but also on account of his overall personality. Such a personality gathers among its followers people who may differ very widely in their opinions, each of whom takes from the whole of the philosophical doctrine what for him is essential in this doctrine. This fact makes itself felt when such an intellectual leader passes away. For the members of the school, and indeed for every single one of them, the question arises in what manner he should preserve and elaborate the received thoughts for himself, and also how to further bring them to bear outwardly. In our case this question arises all the more, as Nelson's system of thought is devoted to the reawakening and elaboration of a philosophy that one had considered as more or less wrapped up; and it arises all the more, as this philosophy has already been elaborated by a thinker differing from the philosopher in many respects, as Fries did with respect to Kant.

Each of us can answer this question only for himself. However, allow me to propose certain ideas in this connection, whereby I do not make any claim

to a complete treatment of the topic, if only for the reason that I will speak here only about questions concerning the critique of knowledge. I would like to stress a certain, uniform complex of thoughts of the Kant-Friesian school which seems to me, in any case, to retain its important role in philosophy.

As you know, there is a certain discrepancy between several claims of the Kant-Friesian philosophy and present-day scientific theories. This discrepancy is quite plain and clear. But it is not that striking that many things in present-day science develop in such a way that makes it possible, if seen in the proper way, to bring to bear the thoughts of the Kant-Friesian philosophy once again, provided only that one is prepared to make certain modifications to it.

Above all I mean those thoughts that constitute transcendental idealism and the difference between intuitive knowledge and purely conceptual knowledge.

If we consider the most recent philosophical doctrines, we find that most of them oppose transcendental idealism in principle. It is especially the philosophy of immanence of Mach's school that is widespread among researchers in the exact sciences and indeed it dominates almost absolutely. This philosophy claims to be able to eliminate the notion of existence in general and to get by with the notion of phenomenon. According to it, there is fundamentally no other kind of knowledge than perceiving, remembering, following the sequence of representations and comparing the contents of representation.

The difficulties of this position are known to you. I need not consider them more closely. I would only like to point out that Willy Freytag in his book *Realism and the Problem of Transcendence* (*vide* [?]) explains very well the weaknesses of the position of immanence. Moritz Schlick also follows this book in certain parts of his *General Theory of Knowledge* (*vide* [?]); however, he again slips back into the position of immanence in another way when characterizing cognition as recognition from the outset, thus restricting cognition again to a mere comparison of the given.

Phenomenalism has received certain refinements. One of these is found today in the Russellian school of mathematical logic. Here the domain of the intuitively given is enlarged by certain logical constructions. It is characteristic in this connection that one essentially deals here only with class constructions, that is only with an abstract kind of comparison. What is united into classes are either contents of representations or classes already constructed. In principle one does not go beyond phenomenalism with this, for Mach and his school have also considered the construction of concepts as

essential in addition to direct intuitive representations.

But the tendency to a restriction to the immanent is quite widespread, not only in those approaches to philosophy that are tied to the exact sciences, but also in the philosophy described as humanistic. An especially remarkable and engaging form of the standpoint of immanence is that adopted in Husserl's phenomenological school. There the principle of *displayability of every single phenomenon* is posited as a methodological guideline, i. e. the requirement that every concept or term introduced be justified by displaying a *phenomenon* determined by it. If this principle is understood in a sufficiently wide sense, there is nothing to object to in it. But there is the obvious interpretation, and it is applied by many followers of the school, according to which our reasoning has to remain in the domain of *phenomena*, i. e. contentual representation, that therefore nothing beyond the given can be reasonably thought of at all. By the way, it is remarkable that Oskar Becker in his book *Mathematical Existence* (*vide* [?]) recently called this standpoint transcendental idealism.

Among the philosophical directions known today there is arguably not a single one that is opposed to the positions just mentioned as fundamentally as the doctrine of Fries. Fries laid stress on exactly *that*, which all these philosophers endeavor to argue away, namely the fundamental transcending of the contentual standpoint by the forms of thought. The categorial formation of a judgment can only be understood as the expression of a "demand of cognition," as an expression of a search, guided by a belief that is already inherent opaquely in every perception and generally in every state of consciousness, but which makes itself explicit in a clearer form only through thought. This belief gives us the conviction that the contents found in experience are to be related to a *reality*, to a unity of *existing* objects, that is in itself real and structured into real connections.

It is understandable why one has serious problems in deciding to accept this doctrine. First of all, one would like to have a standpoint with as few presuppositions as possible, and too much seems to be postulated at the outset with the assumption of rational belief. Upon closer examination, this objection does not apply to the Friesian doctrine of conceptual knowledge as such, but to the view that the content of this knowledge can be rendered in entirely distinct, definitely formulated principles. I would like to point out in any case that the fundamental idea of the Friesian doctrine is by all means compatible with the fact that the way in which, in the investigation of nature, we relate the contents of experience to existing objects by reasoning

is not determined in knowledge but belongs itself to the task of research that is given to us by reason.

There is however another reason for the resistance against the Friesian doctrine. I ignore here the known difficulties related to the question of the correct characterization of the mode of existence of reason and its external relations. It has been very much discussed, especially in our school, whether conceptual knowledge has to be regarded psychologically as a faculty or as a continuous activity. These are difficulties and problems but not really objections; they are objections only for those who, again in the domain of psychology, intend to carry out the standpoint of a complete restriction to contents. Fries thought more vitally in this respect; he was not content with a theory of psychological phenomena, but aimed at a theory of the unit of life; and I think we have reason to agree with him in this respect. What constitutes a more substantial reason for the resistance against the Friesian claims, however, is that on closer inspection one recognizes that one is thereby already necessarily pushed towards *transcendental idealism*. For in the fact that conceptual knowledge asserts itself in the form of a categorial requirement involving only an existential relation (otherwise no more precisely determined) to a world of *existing*, there lies already a division of truth. Both the contentual and the categorial form belong to knowledge as such. According to the position of naive realism we expect to find both united and to have before us in normal perception a complete knowledge. Closer inspection forces us in a well-known way to give up this position; it becomes manifest to us that the uniform perception of experience consists of two distinct parts with respect to knowledge: the givenness of a contentual material and the existential reference to the unity of reality, in which the former has to be integrated in a manner initially unknown.

The fundamental imperfection of our knowledge is based on this. We know the contents of our experience and can talk about them; but how to interpret them as proper truth is known only very fragmentarily, even if to an extent that is sufficient for the purposes of our practical standards of living, within which we fall back on general attitudes based on beliefs where our scientific knowledge no longer suffices.

If we introduce transcendental idealism in a way that is independent of the doctrine of antinomies we can thereby remain in complete agreement with Fries. For the doctrine of the division of truth, which Fries subsequently puts forward for the resolution and explanation of the antinomies, does not need the antinomies for its justification. And this is a methodological advantage,

since the doctrine of the antinomies contains very many problematic arguments. Above all there is the risk of proving too much by posing statements in the antithesis that are by no means in principle irrevocable for scientific thought, and therefore assign boundaries to science, which in fact it does not have. Transcendental idealism must not be understood in such a way that it produces a factual structural discrepancy between what is given in reality and what is asserted in the scientific world view. If science is to have meaning we must take the standpoint that what is claimed in science as factual—as far as it is not a common error in the sense of science itself—also expresses a fact of reality, and in any case it does not deviate from reality in such a way that is expressible in the framework of science itself. The limitation of scientific knowledge must therefore be properly based on the conditions for the possibility of the scientific investigation of nature as such.

Such a condition is, in the first place, the connection to perception. The considerations which force us to give up naive realism, and in general to eliminate sensible qualities in physical considerations have to be imputed to the antinomies. The discursive character of science is a further essential condition arising from the fact that conceptual knowledge is conveyed to us through thought. In fact even here something arises which in any case is inadequate to reality, namely the hypothetical form of the laws of nature. It is not in accordance with the idea of a real connection that the latter consists in a law according to which something takes place under certain circumstances. Such a law can only be a reason but not a real cause. Thus, while the aforementioned antinomy refers to the fact that we don't have knowledge of *existing* in its essence but only as something that stands in certain relations, the second antinomy concerns the lack of essence of the *connection*. The existence of still other antinomies, especially of the kind posed by Kant, should in no way be disputed in principle. But in any case a revision of the given, which goes farther than what has been carried out so far in our school, is necessary.

If we now observe how factual natural science relates to the program of pure immanence we find that one has departed from the observance of a phenomenological program more than ever, despite the conscious emphasis on Mach's thoughts, which were also propounded in particular by Einstein. There we have completely abstract existence claims, which are related to perception only in their consequences. This is especially true for present-day quantum theory. According to this theory the physical state is related

to perception only through *probability* statements, i.e. the physical states whose temporal connection is a wave-theoretical causal one have relevance for perception only through the fact that they involve certain discrete processes in a statistical frequency, computable from the state variables, and these frequencies and also other quantitative determinations of those processes present themselves for the experiment through intuitive quantities, e.g., color and intensity of spectral lines.

Likewise, Einstein's general relativity theory by no means conforms to the tendencies of a pure phenomenalism. The lawfulness of the space-time manifold is here introduced purely conceptually through the assumption of a metric field that forms a physical object analogous to the electromagnetic field. The quantitative distribution of this field is correspondingly determined by spatiotemporal measurements, similarly to the way the shape of the earth is determined by measurements of lengths on the base of our ordinary intuition of space. However, whereas the earth transcends our power of imagination only because of its size, the metric field is in principle out of the range of the intuitively imaginable on account of the union of the spatial and the temporal which takes place in it.

The establishment of such theories, which are very far removed from observation, speaks very strongly in favor of the Friesian doctrine of only conscious conceptual knowledge. Sure enough, these theories cannot be reconciled with the Kant-Friesian doctrine of *pure intuition*. But also in this case, we do not need to give up this doctrine as a whole in order to stay in harmony with contemporary scientific theories, but rather only its specific formulation.

Thus, one rightly disputes the Kantian claim that geometry and physics are bound by the framework of our intuitive representations of space and time as a condition of the possibility of scientific knowledge. In fact, in its abstractions geometry goes far beyond the framework of the intuitive representation of space by having developed into a general theory of ordered manifolds endowed with topological relations within which the laws of Euclidean geometry form only a special structural regularity distinguished by systematic advantages.

Moreover, concerning theoretical physics, its recent development has shown with full clarity that the possibility of theoretical knowledge of nature is completely independent of the acceptance of a determinate structural regularity of space and time.

In another respect, however, the Kantian doctrine of pure intuition has

currently again gained recognition. For a long time heretofore, the dominant opinion was that mathematics could be developed purely out of logic. The attempt to carry out this idea, as it was initially undertaken by Frege and then by Whitehead and Russell has not succeeded, notwithstanding the systematic unity of the work *Principia Mathematica*. Rather, the investigation of the foundations of mathematics has shown two things. First, that a certain kind of purely intuitive knowledge has to be taken as a starting point for mathematics; indeed, that even logic as the theory of judgments and inferences cannot be developed without appealing to such an intuitive knowledge to some extent. It is an issue of the intuitive representation of the discrete from which we draw the most primitive combinatorial representations, in particular that of succession. Constructive arithmetic develops by means of this elementary intuitive knowledge. Secondly, it appears that constructive arithmetic is not sufficient for the theory of real numbers, that rather for the latter we have to add certain notions related to the totality of collections of mathematical objects, e. g. the totality of all the numbers and the totality of all sets of numbers.

It is now remarkable that Fries—in his *Mathematical Philosophy of Nature* (*vide* [?])—already separated the elementary kind of mathematical knowledge under the name “syntactics” from arithmetic in the sense of a theory of quantities. He says about syntactics:

It “contains the most general abstraction that can be given for mathematical knowledge whatsoever. It is solely based on the postulates of the *arbitrary order of given elements* and their *arbitrary repetition without end*. It has no proper theory, for it does not know any axioms; its operations are for themselves immediately comprehensible . . .” (p. 70)

In his considerations on syntactics, however, Fries only thought of the doctrine of permutations and combinations, whereas he treated number theory only in connection with analysis. He stated:

“The purpose of the number system is generally to reduce the knowledge of quantity to concepts, i. e. to recognize the relationships between quantities not only intuitively but also through thought.” (p. 121)

“The specific pure intuition of arithmetic is the continuous series of the larger and the smaller. By scientifically developing this

pure intuition we should *think* the idea of quantity or reduce it to concepts.” (p. 77)

In order to pass from these Friesian views to a conception in accordance with the present state of research one does not need very substantial modifications. Of course, we have to include elementary number theory in the domain of syntactics. Moreover, it cannot be taken for granted that the scientific development of the concept of quantity consists only in the clarification of pure intuitive knowledge. Rather, we have to take the possibility into account that we are dealing here with a conceptual sharpening, an “idealization”—as Felix Klein called it—of the intuitive representation of the larger and the smaller. Even so, the rational element would not yet have been excluded from the arithmetical theory of quantities (of analysis). This is because that conceptual sharpening takes place, as already said, by including certain representations of totality, and thereby we would have to see what reason adds to the intuitive representation. This is supported especially by the fact that the representations of totality applied in analysis become relevant to the system of mathematics by making possible the unrestricted application of the logical *forms of the general and the particular judgment* in the domain of real numbers and functions. And according to Fries the logical forms of judgments are exactly those through which we become aware of conceptual knowledge in thought.

According to such a conception, analysis would already contain a component of conceptual knowledge grasped only by thought. It would thus have the same epistemological character that Fries assigns to pure natural science, and indeed, in contemporary science, mathematics has entirely the role of pure natural science, the “armory of hypotheses,” as Fries puts it.

It is also characteristic that—right from the beginning of the rigorization of infinitesimal methods—some sort of phenomenological opposition arose against the rational element in analysis. At first Kronecker and at present Brouwer and his school propound a position that calls for the restriction to the intuitively representable and according to which the totality assumptions of analysis mentioned above are categorically rejected. Lately Weyl has hinted at the analogy between this “Intuitionism” and Mach’s standpoint.

Hilbert shows, in a completely different way than this opposition, the relevance of his *proof theory* for the special epistemological position of elementary intuitive (syntactical) or, as Hilbert calls it, “finitist” mathematics, *vis-à-vis* systematic mathematics, based on concept formations, in particular analysis

and set theory. Hilbert here subjects systematic mathematics to a sort of critique of proof by which, using elementary finite methods, the deductive consequences of the concept formations of systematic mathematics are investigated, whereby the aim is to show that the application and the pursuit of these concept formations can never lead to discrepancies in the consequences and thus also, in particular, that it cannot lead to contradictions with the elementary intuitively recognizable facts.

For a *philosophical completion* of this proof theory a *methodological explanation* is necessary by which those principles systematized in proof theory receive some kind of deduction in the sense of a clarification of their epistemological methodological significance. This explication should at the same time clarify the methods of mathematical idealization and with this give a satisfying answer to Nelson's question, in what the norm for an idealization could consist, if it does not lie in pure intuition.

In conclusion, I would still like to indicate how the special status of aesthetics becomes understandable through the doctrine of transcendental idealism. In the language of our school the expression "aesthetic" is used for all those objective evaluations, whose measure cannot be conceptually grasped. It appears to be appropriate—on the one hand with respect to the ordinary use of language and also for pointing out essential differences—to restrict the use of the word "aesthetic" to that kind of evaluation in which an object is valued as a *symbolical representation* for something which is not directly accessible to our finite knowledge of nature. According to this, the value of an aesthetic object as such does not attach to the thing as actually existing, as in the case of the value of a noble character whose existence has value for itself, but rather that value is principally related to the representing subject, i. e. the object is only valuable as represented. The objective character of an aesthetic value consists in the objective determination of the *suitability* of an object to serve as a symbolic expression. The interest for such a symbolic expression depends essentially on the imperfection of our view of nature, i. e. the division of truth. We value the symbolic expression of ethical values in the beauty of figures of nature and art, because we cannot directly intuitively represent the value of a being but only assign it conceptually. Likewise, we value the conceptual unity of scientific systems of thought as a surrogate for an immediate intuitive grasp of the unity in the connection of the real.

According to this view, theoretical science has—leaving out of consideration its vital significance for our orientation and our action—an *aesthetical significance*, in so far as we regard it solely under a systematic viewpoint.

This conception indeed remains as the only option, if we do not want to exaggerate the role of exact sciences to that of a perfect worldview, or reduce it to that of a mere tool. Accordingly, the scientific systematization has not only the purpose of saving labor, but also an aesthetic task that is given to us by reason. Only the doctrine of the belief of reason makes the search for a systematic unity and the success of such a search understandable; from Mach's standpoint this success is a pure miracle. On the other hand, from the doctrine of transcendental idealism we take the advice to moderate our expectation of a systematic completeness in the knowledge of nature.

With this I have sketched the sense in which I think possible a vital preservation and continuation of the basic thoughts of the Friesian doctrine. You know that it was Nelson's special concern to ensure that the thoughts of Fries's philosophy would not again be forgotten. I believe that one also has to avert another risk, namely that these thoughts, although preserved in the tradition, be considered only from a historical perspective and not as standing in vital interaction with philosophical intellectual life. The purpose of my presentation was to show that the Friesian doctrine is capable of such a lively interaction with contemporary philosophy and that we do not need to worry that the basic ideas of this doctrine will be lost by modifications that take into account the development of science. Let us also take into consideration that it was Nelson's own intention to tackle, after completion of his system of ethics, the domain of speculative philosophy, and with this in particular, the philosophical methodology of natural science in the sense of a revision and a new treatment of Fries's thought.