3. The Method and Structure of Science

To explain a system of science, it is necessary to clarify the concept of science. This is the only way to avoid conceptual imprecision and later difficulties in understanding. Krause was aware of this, and began both his *Vorlesungen über das System der Philosophie* (Krause 1828) and his *Vorlesungen über die Grundwahrheiten der Wissenschaft* (Krause 1829) with an analysis of the concept of science, which is, simultaneously, a disclosure of the conditions of the possibility of science, and the first part of science: 'We begin our work with a preliminary discussion of the concepts: science, and system of science. Knowledge, science, and the system of science, can only be thoroughly and fully understood within science' (Krause 1869: 3).

The concept of science is first proven to be the organic system of knowledge. Then, it is shown that the system immediately implies the need of the certain intuition of God, as the fact principle of science. Then, the various sources of human knowledge are examined, to determine which of them is able to lead to immediately certain intuition of God. Finally, Krause's characteristic distinction between the two mutually referential parts of science is traced: the analytical-ascending part of science leads to the fundamental intuition of God and the synthetical-descending part of science reads off or deduces the structure of science based on the fundamental intuition of the one principle of science.

3.1 Science as an organic system and the principle of science

Krause begins by stating that science is a system of true findings, differentiated within itself, in which all parts 'exist in relation to each other, not merely as a whole, in which parts are next to one other, collected in a mere aggregate, but as a whole in which all the parts are in, with and through one other [*in, mit und durch einander*], all only in, with and through, the whole' (Krause 1869: 4). Krause calls such a system of knowledge an 'organism' and characterizes an organism as follows: 'Everything is essentially joined to form a whole which contains parts, each of which, although something specific, and existing for itself, nevertheless exists only for itself, by, and

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

as long, as it is in a certain connectedness, and interaction, with all other members of that structure [*Gliedern*], which also account for the organism' (Krause 1869: 4). Based on this concept of science, 'the whole of knowledge is thought under the system of science, in which all particular items of knowledge are contained, as parts, related to each other and within the whole. Even the name "science" [*Wissenschaft*] suggests this. And since parts, which are united in a whole, among themselves and with the whole, are called members [*Glieder*], science is thought as a related structure of its members [*Gliedbau*]' (Krause 1886a: 1).

In the organic system of science, each individual item of scientific knowledge is logically and semantically connected, directly or indirectly, with some other item of knowledge. It is only by these logical and semantic compounds that any item is the item of knowledge it is. A single item of putative knowledge that stands alone, or that is not logically and semantically connected to the system as such, cannot exist in science according to Krause, because, through any single item of knowledge, all other true findings are, at least implicitly, given. This thesis of the systematic connectiveness of all items of knowledge, however, does not imply that one who has attained a single item of knowledge *de facto* has all the knowledge with which it is linked. Krause does not argue for the logical and deductive omniscience that seems *prima facie* to follow from his understanding of science. It is a thesis purely about the logical and semantic structures, the relations between the items of knowledge, in the system of science.[24]

Based on this concept of science, Krause emphasises that the possibility of science as an organic system of knowledge implies that there is a principle

24 On the problem of logical or deductive omniscience, see Hintikka (1962) and Stalnaker (1991: 425): 'From their beginning, epistemic and doxastic logics – the logics of knowledge and belief have been modelled on modal logic – the logic of necessity and possibility. Knowledge and belief, in such logics, are analogous to necessity. […] Developers of such logics invariably remark that the principles of deductive closure are unrealistic, since it is obviously false that knowers in general know all the deductive consequences of anything that they know. The assumption that knowers do, as a matter of logic, have such knowledge – that they are deductively omniscient – is defended as an idealization. Sometimes the divergence between the assumptions of the ideal theory and the facts about the domain of its intended application is described as a problem for epistemic logic – the problem of logical omniscience.'

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

in virtue of which the system of science possesses both its unity as a single system of science and also its diversity as a system constituted by particular sciences: 'Every special science has a certain independence. For if the basic idea, the basic thought, is given to a special science, then it can be partly developed for itself. But the fundamental ideas of all the special sciences are united in the principle of science: all the special sciences are fundamentally contained in the one fundamental principle of the one science. And the highest perfection of every special science, to which humanity and mankind can attain, can only be gained if every special science is formed as an inner, well-connected link in the one principle of science' (Krause 1829: 2). Krause deploys the terms 'ultimate ground' and 'ultimate principle' as synonyms and specifies the notion of a principle as follows: 'Principle means both the beginning, the action, and the factual, the beginning with, what is the first, which is the foundation; therefore: the principle as a thing, or the principle of being, the essence of the thing, the being, which is the first, which is the beginning, which is the basis of all' (Krause 1869: 10). According to Krause, it is only by accepting the idea of such a principle, which he also refers to as the scientific principle of fact and knowledge, that an organic system of science is possible. For 'the two principal moments [of science] are: (1) the unity according to which all scientific knowledge is a single truth, (2) the manifoldness, diversity, and plurality, according to which the whole wealth of all particular, definite, items of knowledge are contained in the one [principle of science]' (Krause 1869: 7).

Because the scientific principle of fact and knowledge is that in virtue of which science is an organic system of knowledge, it follows that based on knowledge of this principle, the whole system of science could, in principle, be established. As Krause (1869: 12) argues: 'If, therefore, it is thought that the whole manifold of what is to be known is determined by and through this principle, then this principle is thought as the ground of all that is. If, now, this principle is thought as ground and cause of all different manifolds, in virtue of which they exist and possess their essence, then the possibility is given of knowing all the manifolds in and through the unity of this principle.' That is, based on the assumption that the organic system of science is 'a structure of subordinate sub-systems and subsystems, the development and peculiar design of which are the individual sciences' (Krause 1829: 13)

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

it follows that the principle of science 'is, at the same time, the basis and content of the entirety of science' (Krause 1829: 13)

So if there is science and if science is an organic system of knowledge, then this implies the existence of a principle that both accounts for the unity of science and for its diversity. There must be, in other words, an ultimate ground of the unity and diversity of science, where Krause defines 'ground' (*Grund*) as follows: 'But the ground, as such, is also that which determines the Essentiality of that which is determined in it. […] In so far as the ground determines the grounded, so that it agrees [*übereinstimmt*] with it, we call the ground: "cause"' (Krause 1869: 148). Consequently, as Krause argues, as an intellectual activity, 'science is only possible when it is granted to human reason to know the one, infinite, unconditioned principle of science, which is recognized as the one ground of everything finite' (Krause 1893: 72). In other words, 'if it should be found, by further investigation, that there is no way that the object of science may be known, then it would have to be asserted that science is impossible' (Krause 1869: 8).

The existence of this principle, however, cannot be proven *within* the system of science, first, because science operates by deploying the principle of sufficient reason, and second, because the principle of science must be known with immediate certainty. On the one hand, to prove something, according to the principle of sufficient reason, means to know 'that its essence must be, as it is, in virtue of a higher whole' (Krause 1869: 12). A proof must show that that which is to be proven, in its essence, cannot be other than as it is, in virtue of its being grounded in a higher principle. To prove something, therefore, means to show that it is necessarily determined, as it is, by another, as this very essence. According to such a concept of proof, it follows that the existence of the scientific principle of fact and knowledge cannot be proven within the system of science, because, for conceptual reasons, there is no higher principle in the system of science which could determine it. As Müller (2008: 154) argues: 'If further proof were required for any possible proof, an infinite regress would arise, and, consequently, no proof would ever be produced: the putative claim to validity would be absolutely refuted. Therefore, it is not only not a weakness of a fundamental principle that it does not need any proof, nor is capable of it, but its necessary characteristic.'

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

On the other hand, the principle of science must be recognized as immediately certain because any alleged item of knowledge that is not immediately certain includes a possibility of error that must be excluded from the recognition of the principle of science. To establish the system of science, therefore, only knowledge is acceptable 'for which this difficulty does not arise' (Krause 1869: 6). As Krause (1886: 9) argues: 'If, therefore, there is knowledge of a principle which is unlimited, is all that is, then, in this knowledge, is the insight that this principle is without ground. And, consequently, the knowledge of this principle, as knowledge without ground, cannot be proven. It is in no need of proof. It is not just evident, like the knowledge that I am I, but also outside, and independent, of ground or proof.'

3.2 Science and intellectual intuition

The scientific principle of fact and knowledge must be known as immediately certain and as requiring no proof. In order to clarify how this is possible, Krause must describe the human capacity for knowing, and show that people have the capacity to possess the immediate, certain, intuition of this principle that Krause, without confessional inclinations, also refers to as God or *Orwesen*. Since, according to Krause, neither the sensual nor the conceptual sources of knowledge, neither the senses nor mind and reason, is able to immediately and certainly recognize this principle, he argues that humans have another source of knowledge: the possibility of intellectual intuition (*Schauung*, *Grundschauung*).

A source of knowledge is a method to justify knowledge. Krause distinguishes sources of knowledge into *sensory* and *non-sensory*. Sensory knowledge is divided into two: 'And indeed, the domain of sensory knowledge is double: that of external sense, bound to the bodily senses, and that of inner sense, which is apparent in the imagination [*Phantasie*]. So is the world of the poet, and the inner world of the historical researcher, who pictures the external inwardly. In short, whoever deals with the sphere of all our knowledge grasps, in sensory knowledge, the flowing, the finite, the temporal, which flows out of the sensory source of knowledge' (Krause 1869: 26). While sensory knowledge is justified by the senses, non-sensual knowledge is justified by the understanding and reason alone, that is, by conceptual reflections: 'In so far as one considers the individual through

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

his differences from other individuals, he is understanding [*Verstand*, *intellectus*]. In so far as one holds, and unites, several individuals against several other individuals, he is describable as reason [*Vernunft*, *ratio*]. The understanding separates and distinguishes, reason connects and relates. Both are opposed in their intention, but always active at the same time. In so far as reason is concerned with the unification of knowledge, it is called theoretical, but in so far as it attempts to unite actions, practical reason' (Krause 1892: 41). In more detail, sensory knowledge 'shapes the completed, finite, individual, in time' (Krause 1869: 27), while the objects of non-sensory knowledge 'do not occur in time, do not change, but apply to the whole of changeless time. Therefore, we can say that these general objects are eternal, and the knowledge of them is of eternal truth' (Krause 1869: 27).

The object domains of sensory and conceptual knowledge are not completely disjunctive: not all knowledge is either justified solely by the senses or by the understanding and reason. Rather, 'we find that our sensory knowledge is constructed with the help of the conceptual, and we are prompted by the reverse consideration that the sensual forms concepts, as such a vast number of terms, all abstracted from the sensible world, is already in common consciousness. If, for example, we judge that the character of a human being is good and beautiful, this knowledge is such unified knowledge. For, from the one side, we recognize the idea of the good and the beautiful and of character. From the other side, we look at the person in individual determinateness, and this knowledge is historical and sensory' (Krause 1869: 27/28).

If sensory and non-sensory knowledge sources were the only sources available to humanity, then the knowledge of the scientific principle of fact and knowledge would either have to be knowledge justified by sensory knowledge, or knowledge justified by understanding and reason, or justified by both sources. But since this principle 'is neither a mere concept, nor a completely finite sensory intuition, nor an item of knowledge united from a concept and a sensation, but […] [is] unconditioned knowledge prior to, and higher than the distinction between the conceptual and sensual, and prior to the union of the two' (Krause 1869: 30), it follows that neither the sensory nor the non-sensory knowledge source is capable of enabling direct, certain, knowledge of the principle of science.

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

As our normal knowledge is conceptual, or mediated by the senses, so the knowledge of the fact principle can be neither conceptual, nor sensory, nor a union of both. It must stand above the opposition, and the unity, of conceptual and sensory knowledge. Krause calls the appropriate form of recognition simply an *intuition* (*Schauung, Grundschauung*). The principle of science must therefore be found in an immediate, certain, intuition that 'is prior to and higher than all opposition within knowledge, including prior to and above the opposition of sensory and non-sensory […] knowledge' (Krause 1886a: 91). Because the condition of the possibility of science is the knowledge of God as the principle of fact, we can conclude, by substitution, that the condition of the possibility of science is directly linked to the possibility of intellectual intuition. Science is possible if and only if intellectual intuition of God is possible, or, in Krause's terminology, when the intuition of *Orwesen* as the one object of science is possible.

3.3 The analytical-ascending part of science

Although any person can demonstrate that the scientific principle of fact and knowledge is a necessary condition for the possibility of science as an organic system – this is little more than a conceptual exercise – it needs pedagogical guidance to achieve the fundamental intuition of the existence and essence of this principle. As Krause (1886: 9) says: 'If there is such knowledge [of the principle of science], it must be attainable by everyone, but it is not immediately apparent to everyone. One should, however, be able to instruct everybody to obtain this intuition of the principle of science.'

It is the task of the analytical-ascending part of science to provide these instructions: 'From the first certain knowledge which can be found in any awareness […] [this part of science] ascends steadily to ever higher knowing, to the discovery of the fundamental knowledge [of God as the principle of science], which must be able to be demonstrated in this way, if a system of science is to be possible for the human mind at all' (Krause 1886a: 4). Because the analytical part of science is distinct from any other training, just this very knowledge may find an application which is directly and immediately certain, to any human subject: 'The whole structure [*Gliedbau*] of the analytical part comprises the spirits of all nations, children, adults

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

and old men, male and female, in all their states, rude and educated. For it grasps man as a man in various senses, purely as man, as spirit-man, in the common spirit-state common to all pre-scientific men, as it were on the ground and soil, in which all the peculiar differences of the pre-scientific mind and mood are rooted, germinated, and grown' (Krause 1890: 39).

In this way, the subject itself becomes the starting point for the analytical-ascending part of science, which has at its disposal only that knowledge which it immediately finds in itself. Metaphysical assumptions, logical assumptions, epistemological assumptions, and similar, whose validity cannot be detected *eo ipso*, by the subject, must therefore be bracketed: for 'the analytical part is not implicit in all sorts of hypotheses, and in desultory reasoning, but it grasps the first certainty of the consciousness of spirit. And all prerequisites, all hypotheses, all unauthorized ruminations, are kept from the analytic way. There is also no question of what we feel, believe, think, wish, hope, but only of what we already know' (Krause 1869: 20).

Because of the requirement that the analytical part of science only be based on knowledge obtained without reference to metaphysical, logical, and epistemological assumptions in whose light the ego could already be interpreted, it follows that Krause's analytical-ascending part of science is, methodologically, *transcendental phenomenology*. Transcendental phenomenology, as analytical-ascending science, has the task of leading to knowledge of God, through the analysis of the conditions of the possibility of phenomenology itself. The subject must arrive at the intuition of the principle of science only by describing that which the ego must necessarily bring to the knowledge of himself. The immediately certain intuition of God must be fulfilled from the knowledge that the subject immediately reflecting on itself is immediately certain of.

With this characterization of the analytical part of science, Krause sees himself as fulfilling a tradition that began with Socrates: 'Historically, I note that our analytical part of science has been sought, conceived, and partly formed by several thinkers. Thus, in the series of Hellenic thinkers, Socrates apprehended the essence of this uplift of the finite spirit, as a principle: by urging: Know thyself. And he reaffirmed perceiving God, and things outside oneself, only by self-knowledge. In just the same way, Kant

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

compares himself to Socrates. […] Since then, however, the analytical part has been lacking in all, even in all German systems of philosophy' (Krause 1869: 22).[25]

3.4 The synthetical-descending part of science

To arrive at the synthetically-descending part of science, it is necessary to fulfil the intuition of the principle of science. This is the task of the analytical-ascending part of science, which leads to the fundamental intuition of the ultimate principle of fact and knowledge that Krause refers to as God or *Orwesen*. The analytical part of science is the way up to this principle; the synthetic part tries to show how the organic system of science can be read off or deduced from the intuition of this principle. As Krause (1886a: 4) says: 'In the first [part of science], from the first certain knowledge which is found in every consciousness, all of it certain, but particular and conditioned, the analytic part collects knowledge by self-observation […]. And, at the same time, it steadily becomes ever higher, to the discovery of that fundamental knowledge of the nature and existence of God, that is, the principle of science, which must show itself in this way if a system of science is to be possible for the human mind. […] The second main part of the system of science then forms in, and through, the fundamental intuition of the principle, that is, in and through the intuition of the principle of all special, conditioned, sciences the system of science as an organism.' Based on the intuition of God as the one principle of science, the synthetical-descending part of science establishes science as an organic system of science: 'Based on the knowledge and acknowledgment of the fundamental principle, the elaboration of all knowledge is the only task of the whole of scientific culture.

25 Krause saw the first beginnings of scientific thought in Kantian philosophy: 'Hence the moment of consciousness, where this distinction is first drawn, where the human being, conscious of his thinking and his knowledge, raises the question: whether his thoughts also have objective validity. Therefore this moment is the first temporal germ of science in the thinking mind: herewith, the thinking mind enters the site of the scientific. Hence, even the new German philosophy begins its new work from the point just explained. As Kant recognized, it as the first task of philosophy to answer the question: How do we arrive at assigning our thoughts objective validity?' (Krause 1869: 6).

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access

The one thought, the infinite, unconditioned *Orwesen*, unfolds itself in the finite mind in an organism of scientific thought, so that just as everything that exists and lives is in the One, so also all knowledge lives in the one knowledge of the One' (Krause 1869: 20). In other words, Krause's 'chief principle is that all science rests upon the intuition of an infinite substance, which intuition cannot be proven according to the principle of sufficient reason, but can only be shown as present in the human mind. All that is, is this substance and is in this substance, and all scientific knowledge must also be grounded in that intuition, and through it' (Krause 1903: 362).

However, the analytical part of science is not only a heuristic accessory, for arriving at the intuition of God. Truths known in the first part of science cannot be withdrawn or revised, at a ny point, in the synthetical part of science. This is not possible because they are known as direct, certain, truths: 'Therefore, if the principle is acknowledged, the content of the analytical part is by no means repudiated, corrected, or rejected, but rather acknowledged in the light of the principle. So, the first analytical part of science does not grow up like useless germs or leaves but it remains the same as the lower root, and as the first branches of this tree of science, in the finite spirit. […] What is found analytically remains true forever, and then enters into the whole system of synthetic science as a subordinate part' (Krause 1869: 21).

3.5 Summary

For Krause, science is the whole system of true items of knowledge, in which any item of knowledge is systematically related to all the other items of knowledge, and it is only through this relation with other knowledge that it is the knowledge it is. That the infinite and different items of knowledge are unified into a system of science, implies that there must be a principle of science, which founds and combines all knowledge as primal ground. Krause also calls this fact principle of science God or *Orwesen*. Since the fact principle holds all knowledge in itself, and so is the one real object of science, it follows that science, for Krause, can be understood as the doctrine of God Himself. The analysis that science is an organic system of knowledge thereby leads in a direct way to the conclusion that 'to study science is divine work, and to teach science is the way to lead human beings, as knowing beings, to God. To teach it is the intuitive person's holy duty' (Krause, 1886a: n. 7).

Benedikt Paul Göcke - 9783631746929
Downloaded from PubFactory at 04/07/2020 01:35:35AM
via free access