CHAPTER 2

The Development of *Naturphilosophie*

1. The Claims of *Naturphilosophie*

Schelling's break with Fichte is largely a tale about the development of his *Naturphilosophie.* This project was Schelling's own brainchild, and the extent of his growing independence from Fichte can be readily measured by the degree to which he gave it autonomous status apart from the *Wissenschaftslehre. Naturphilosophie,* in its mature and complete form, involved two assumptions completely at odds with Fichte's *Wissenschaftslehre:* first, transcendental realism, the thesis that nature exists independent of all consciousness, even that of the transcendental subject; second, transcendental naturalism, the doctrine that everything is explicable according to the laws of nature, *including* the rationality of the transcendental subject. The more Schelling developed his *Naturphilosphie,* making it independent from the *Wissenschaftslehre,* the more he articulated and defended these two assumptions. Since it was just these assumptions that Fichte had so stoutly resisted in the *Einleitungen,* the growth of the *Naturphilosophie* made a break with him all but inevitable.

The genesis of *Naturphilosophie* is not only a story about its struggle for *independence* from the *Wissenschaftslehre,* but also a tale about its battle for *domination* over the *Wissenschaftslehre.* For *Naturphilosophie* eventually acquired not only equality to, but priority over the *Wissenschaftslehre.* Rather than making both kinds of philosophy equal partners in one system, Schelling made the *Wissenschaftslehre* part of *Naturphilosphie* itself. Hence there was a complete reversal: *Naturphilosophie* began as the servant to the *Wissenschaftslehre* but ended as its master.

How did such a remarkable reversal come about? Why did Schelling change his position so dramatically? We can begin to answer these questions

only by carefully retracing Schelling's steps, the stages of development of his *Naturphilosophie* from 1797 to 1799.

2. The Early Fichtean Phase

The starting point of the story is Schelling's early 1797 *Abhandlungen zur Erläuterung des Idealismus der Wissenschaftslehre,* the most Fichtean of all his early writings and the furthest removed from his later position. In this work Schelling virtually forbade the possibility of *Naturphilosophie* as he later understood it. He does not regard *Naturphilosophie* as a complementrary science to the *Wissenschaftslehre,* as he will do in 1799 and 1800, and still less does he consider it the foundation of the *Wissenschaftslehre,* as he will do in 1801. Rather, he denies the very possibility of a *Naturphilosophie* that begins with the reality of nature and then derives the self-consciousness of the 'I' according to necessary laws. Thus, in the *Abhandlungen,* Schelling argues that we have only two options in philosophy: either we explain matter from spirit or spirit from matter. Since we cannot understand matter in itself, and since we originally understand only ourselves, we have no choice but to explain matter from spirit (I, 373). Schelling even denies one of the central premises of his later *Naturphilosophie:* that there is some inner dimension to matter. To be sure, matter is not merely passive and inert; but it still does not have the capacity to reflect on itself, which is characteristic of subjectivity. In other words, the power of matter works outward, reacting to stimuli; but it does not return into itself, and so it has no self-consciousness, the necessary characteristic of having some inner life (379).

The distance of the *Abhandlungen* from the later *Naturphilosophie* becomes all the more apparent when Schelling attempts an idealist deduction of the concept of an organism. Rather than the mediating concept between subject and object, as in the later *Naturphilosophie,* the concept of an organism is now derived from the subjective realm alone. Hence Schelling explains the self-causing activity characteristic of an organism from the subject's tendency toward self-consciousness. Insofar as the subject knows that it is the cause of its own representations, it knows that it is the cause and effect of itself, and so that it has a *self-organizing* nature (386). Schelling then generalizes the argument, deriving the whole organic concept of nature from the subject's striving toward self-consciousness: "Since there is in our mind an infinite striving to organize itself, a universal tendency toward organization

must also reveal itself. Hence it is really the case. The system of the cosmos is a kind of organization that has formed itself from a common center" (386).

Schelling's first writings on *Naturphilosophie*—his 1797 *Ideen zu einer Philosophie der Natur* and his 1798 *Von der Weltseele*—make clear its dependence on the *Wissenschaftslehre*. In the preface to the *Ideen* Schelling explains that *Naturphilosophie* is simply the *application* of pure theoretical philosophy, whose task is to investigate the reality of all of our knowledge. Rather than developing new concepts and arguments, *Naturphilosophie* simply illustrates the principles of the *Wissenschaftslehre* as they relate to nature itself (II, 3–4). In both of these works Schelling stresses that the two basic concepts of *Naturphilosophie*—attractive and repulsive force—are in need of a "transcendental explication."[1] These forces have to be presupposed in *Naturphilosophie,* because their foundation lies in transcendental philosophy, which derives them from the main activities of the mind. Starting from Fichte's analysis in the 1794 *Grundlage,* Schelling maintains that imagination, the fundamental faculty of the mind, consists in two basic activities: one directed outward and extending to infinity, another directed inward and tending toward a single point.[2] These activities have their analogues or embodiments in nature: the first activity corresponds to repulsive, the second to attractive force. Just as the object of intuition is a synthesis of these activities, so the object in nature is a product of the equilibirum of these forces. Thus the object of nature simply objectifies and manifests these basic activities of the mind, so that matter turns out to be "nothing other than the mind intuited in the equilibrium of its activities."[3]

The subordinate role of *Naturphilosophie* to *Wissenschaftslehre* was inevitable, of course, as long as Schelling continued to avow the fundamental principles of Fichte's idealism. One of these principles is that the absolute is subjective, the ego rather than nature. If the absolute is the ego, then nature must be only its mode or manifestation. Since the ego is the subject matter of the *Wissenschaftslehre* and nature the object of *Naturphilosophie,* it follows that the *Wissenschaftslehre* must have precedence over *Naturphilosophie*. The priority of *Wissenschaftslehre* over *Naturphilosophie* in this regard becomes plain when Schelling says that the former deals with the infinite and unconditioned while *Naturphilosophie* treats only the finite and conditioned. Though, as we have seen, Schelling had his doubts about the subjectivity of the absolute (4.1.3), he still continued to affirm its subjective status. While the *Briefe* proposed that the absolute is both subjective and objective, Schel-

ling did not persist with this suggestion but relapsed into the more Fichtean standpoint. Indeed, as we have also seen, even in the *Briefe* he continued to defend idealism over realism.

On the basis of this principle, Schelling continued to admit the subordinate role of *Naturphilosophie* as late as 1799. In his *Entwurf eines Systems der Naturphilosophie* he states that every science has the right to regard its subject matter as unconditioned and self-sufficient, and he stresses that even *Naturphilosophie* is entitled to view nature as an independent realm (II, 17). Nevertheless, Schelling does not abandon but reaffirms his idealism. He states that the autonomy of nature is only a *regulative* or *methodological* principle of *Naturphilosophie,* which means that it should proceed only *as if* nature were the unconditioned. Still in keeping with his idealistic arguments in *Vom Ich als Prinzip,* Schelling concedes that only transcendental philosophy has the *real* unconditioned or absolute for its object (II, 11).

Schelling was further held back from developing his *Naturphilosophie* because of his adherence to another central principle of Fichte's idealism: that the ego is only for itself. Fichte invoked this principle against Schelling in the *Erste Einleitung* in his attempt to show the limitations of naturalism. But the irony is that Schelling himself reaffirmed it around the same time as Fichte. In the 1797 *Abhandlungen* Schelling appealed to this principle to defend idealism against materialism (I, 373); and in his 1797 *Einleitung zu den Ideen einer Philosophie der Natur,* he employed it against Spinoza's naturalism. The naturalist cannot explain the possibility of self-consciousness, Schelling argued, because he treats the ego as if it were only an optical glass reflecting the rays of the world impinging on it (II, 21, 32–33). Like Fichte, Schelling maintained that the problem with naturalism is that it cannot bridge the gap between consciousness of the world and the world itself, so that in the end it too cannot avoid dualism. Only idealism, Schelling concluded, provides a remedy for the patent inadequacies of naturalism and dualism (II, 32–33).

Schelling's arguments against dogmatism hardly seem to square with his more charitable view, already espoused in *Briefe über Dogmatismus und Kritizismus,* that dogmatism and criticism have an equal validity. To liberate *Naturphilosophie* from the confines of the *Wissenschaftslehre,* it would seem, Schelling only had to stress the equal status of dogmatism. Still, this was a step that Schelling was not ready to take in 1795, or even for several more years. We have just seen how Schelling—a more loyal student than Fichte imagined—reinvoked and reiterated his idealist principles against Spinoza's naturalism. But even in the *Briefe,* which is his work most sympathetic to

Spinoza, Schelling did not refrain from expressing his reservations about dogmatism. And, in any case, his defense of dogmatism in the *Briefe* is very limited. If Schelling maintained that dogmatism cannot be refuted, he also insisted that it cannot be demonstrated; and he gave it only a strictly *practical* legitimacy alongside criticism. Schelling will take the crucial step toward *Naturphilosophie* only when he declares that dogmatism has an equal *theoretical* legitimacy to criticism.

3. The First Decisive Step

That step was taken sometime in 1799 in the *Einleitung* to the *Entwurf eines Systems der Naturphilosophie,* which Schelling probably wrote shortly after the *Entwurf* itself. Schelling now states explicitly that transcendental philosophy and natural philosophy are equal to and independent from one another, both providing necessary perspectives on a single reality: the activity of reason or intelligence. This activity has two appearances: a necessary or subconscious form in nature, and a free or conscious form in the ego. Since these are simply different aspects of a single reality, Schelling argues, we should be able to explain each in terms of the other. Transcendental philosophy begins from the free and conscious activity of the ego and derives its necessary and subconscious appearance in nature; natural philosophy begins from the necessary and subconscious activity of nature and derives its free and conscious appearance in the ego (II, 271).

The methods and aims of *Naturphilosophie,* Schelling further explains, are completely independent of those of transcendental philosophy. *Naturphilosophie* banishes all idealistic explanations, such as the theory that nature is nothing but an organ for self-consciousness. These kinds of explanation are as bad as the old teleology, Schelling claims, because they treat nature as if it were made for our ends. The first maxim of *Naturphilosophie* is that of all natural science: to explain everything on the basis of natural powers alone (273). This principle means treating nature as a self-sufficient and autonomous realm, whose investigation should be free from the guidelines of the transcendental philosopher.

It is striking that in the *Einleitung zu dem Entwurf,* in contrast to the *Entwurf* itself, Schelling no longer insists that the autonomy of nature is a mere fiction. Now that idealism and realism have equal status as explanations of the absolute, the *Naturphilosoph* has as much right as the *Wissenschaftlehrer* to consider his object as the absolute. *Naturphilosophie* is no longer beholden to

the *Wissenschaftslehre* to determine the real nature of the unconditioned, as if *Naturphilosophie* were relegated to deal with an artificial abstraction. Hence Schelling now calls *Naturphilosophie* the "Spinozism of physics" because it posits nature as the absolute and unconditioned (III, 273).

The equal and independent status of *Naturphilosophie* seems to entail accepting the very naturalism Schelling had once rejected in the *Ideen*. If we can begin from the powers of nature and derive all the free and self-conscious activities of the ego, then these activities will be nothing more than the highest organization and development of the powers of nature. But now Schelling embraces just this conclusion. Remarkably, he insists on extending the principles of naturalism to the highest forms of intelligence, so that reason itself proves to be nothing more than "a play of higher and necessarily unknown natural powers" (*ein Spiel höherer und notwendig unbekannter Naturkräfte*) (273–274). This means, as Schelling later put it, that the subject's awareness of nature amounts to nothing more than nature coming to its *self*-awareness through him. This was indeed a decisive move, for it involved abandoning Fichte's principle that the ego is for itself, explicable in terms of its self-consciousness alone.

It is important to recognize, however, that Schelling is ready to extend the principles of naturalism only because he denies one central premise behind Fichte's argument against naturalism: the assumption that naturalistic explanation is mechanistic. Schelling's willingness to extend naturalism to the Fichtean ego goes hand-in-hand with his growing conviction that the idea of an organism has to be given a constitutive status to resolve the outstanding Kantian dualisms.

4. The Priority of *Naturphilosophie*

In the *Einleitung zu dem Entwurf* Schelling made the vital move in giving equality and independence to his *Naturphilosophie*. But this was far from the final step in the evolution of the *Identitätssystem*. For Schelling had still not conceived of the *single* absolute standpoint that would unite both transcendental philosophy and philosophy of nature. In the preface to his 1800 *System des transcendentalen Idealismus* he reasserted the equality of transcendental philosophy and philosophy of nature; but he insisted that, just because of their complementarity, they would never be able to form a unity (III, 331). To be sure, he had envisaged something like a single standpoint in his *Briefe*, when he conceived of the critique of pure reason as the canon of both real-

ism and idealism. But Schelling was now searching for something more than what that standpoint had ever promised or provided: namely, a *theoretical* foundation for both realism and idealism. As we have just seen, the standpoint of critique in the *Briefe* could ensure at best only a *practical* foundation for idealism and realism.

Shortly after writing the *System*, which he had completed in March 1800, Schelling took another decisive—and dramatic—step toward the development of the *Identitätssystem*. In his 1800 *Allgemeine Deduktion des dynamischen Prozesses* Schelling is no longer content simply to demand equality and independence for his *Naturphilosophie*. Rather, he insists on its *priority* over transcendental philosophy.

This move is at first puzzling and surprising—a complete *volte face* for the former idealist—but it follows inevitably from the development of *Naturphilosophie*. Schelling now recognizes that there is something abstract and artificial in the standpoint of idealism: it reverses the order of nature itself, treating the *ratio cognoscendi* as if it were the *ratio essendi*, or what is first in the order of knowledge (the subjective) as if it were the first in order of being. The net result of such a confusion is that it removes the self-consciousness from its place in nature, treating it as if it were eternal and given, when it is in fact the product of the development of the powers of nature. The self-consciousness of the transcendental ego is not something self-sufficient, but it is really nature coming to consciousness through him. What the transcendental philosopher therefore presupposes—an intellectual intuition of his own activity—has to be reconstructed by the philosopher of nature, who provides "a physical explanation of idealism" (§63; IV, 76). Schelling says that the philosopher can proceed in either of two directions: from nature to us, or from us to nature; but he then makes his own preferences all too clear: the true direction for he who prizes knowledge above everything is the path of nature itself, which is that followed by the *Naturphilosoph* (IV, 78).

In his next writing on *Naturphilosophie*, his essay 'Über den wahren Begriff der Naturphilosophie und die richtige Art ihre Probleme aufzulösen,' which he wrote shortly after *Allgemeine Deduktion*, Schelling took stock of the fateful step he had now taken. That he had now overthrown the hegemony of the *Wissenschaftslehre* was clear; but he still had to explain its place in the new philosophy that was coming into being. The main interest and subject matter of the *Wissenschaftslehre*, Schelling now said, is the philosophy of philosophy. Of course, to know the nature of philosophy it is necessary to begin with the knowing subject, and to abstract from everything objective, in the

Fichtean manner. But, for just this reason, Schelling insists, the *Wissenschaftslehre* is not philosophy proper, which consists in knowledge of nature itself. Thus Schelling identified *Naturphilosophie* with philosophy itself. He thinks there will still be room for the transcendental ego in his new system of philosophy; but it will no longer be the starting point but the result. The self-consciousness of the transcendental ego will be nothing less—though also nothing more—than the highest potency of nature, the final stage of organization and development of all its powers.

As we shall soon see, to understand the *Identitätssystem* it is of the first importance to keep in mind the *priority* of *Naturphilosophie* over *Wissenschaftslehre*. The *Identitätssystem* is really a *Naturphilosophie* whose highest level, stage, or "potency" is the *Wissenschaftslehre*. Although Schelling sometimes continues to write of the parity between the two sciences even after 1800, the *Identitätssystem* is ultimately based on *Naturphilosophie*. Nowhere is this so clear as in 'Über den Begriff,' for here Schelling argues that the principle of subject–object identity exists properly, purely, and completely only within the realm of nature itself. He explains that the identity of the subjective and objective means, only in the *popular* sense, that the ego and nature have parity with one another; but, in the *philosophical* sense, it signifies that nature is *pure* and the ego is a *derived* or *subjective* subject–object identity (IV, 86–87).

'Über den wahren Begriff' appeared only months before the *Darstellung meines Systems,* the first exposition of the *Identitätssystem*. Schelling's concept of *Naturphilosophie* had come full circle: once the maidservant of the *Wissenschaftslehre,* it had now become its master. The *Wissenschaftslehre* is no longer the foundation of *Naturphilosophie,* but *Naturphilosophie* is the foundation for the *Wissenschaftslehre*. The break with the subjectivist tradition could not have been more total.

CHAPTER 4

Problems, Methods, and Concepts of *Naturphilosophie*

1. Absolute Idealism and *Naturphilosophie*

Above the portals of the academy of absolute idealism there is written the inscription '*Let no one enter who has not studied Naturphilosophie.*' Without an understanding of at least the central doctrines, basic arguments, and fundamental problems of *Naturphilosophie* the absolute idealism of Schelling and Hegel is all but incomprehensible. This should be clear enough simply by a cursory look at almost any of Schelling's and Hegel's texts, where so much *Naturphilosophie* appears. But no one should be tempted to dismiss this material for the sake of some deeper philosophical substance that exists underneath it. For the philosophical substance of Schelling and Hegel is absolute idealism, which is inseparable from *Naturphilosophie*.

The close connection between absolute idealism and *Naturphilosophie* is clear in two respects. First, as we have already seen (4.2.4; 4.3.6), Schelling's absolute idealism arose from his *Naturphilosophie*, and more specifically from its struggle for independence from, and then hegemony over, the *Wissenschaftslehre*. We should recall that, by late 1799, Schelling maintained that the principle of subject–object identity, the fundamental principle of absolute idealism, is the prerogative of *Naturphilosophie* alone. The *Wissenschaftslehre* and *Naturphilosophie* are not just equal to one another, he argued, but the former is based on the latter, since the self-consciousness of the transcendental ego is derived from the laws of nature in "the physical proof of idealism." It is only in a *popular* sense that the principle of subject–object identity means that ego and nature are equal to one another; in the proper *philosophical* sense it signifies that the ego is derived and nature is fundamental. In other words, subject–identity is originally found not in the self-consciousness of the ego but in the single universal substance. That there is a single universal substance, of which the subjective and objective are only

manifestations, is the fundamental proposition of *Naturphilosophie;* but it is also the sum and substance of Schelling's absolute idealism around 1800.

Second, the intimate bond between absolute idealism and *Naturphilosophie* is also apparent from Schelling's own use of the term 'absolute idealism' (*absoluter Idealismus*).[1] In the early 1800s, Schelling used the term specifically to refer to the standpoint of *Naturphilosophie.* Absolute idealism is not a synthesis of the idealism of the *Wissenschaftslehre* with the realism of *Naturphilosophie,* a combination of both standpoints where each has equal legitimacy. Rather, it is nothing less than the inversion of the *Wissenschaftslehre,* the derivation of transcendental idealism from the realism and naturalism of *Naturphilosophie.* In other words, it is Fichte standing on his head.

Despite its importance for absolute idealism, *Naturphilosophie* has been ignored or spurned for decades, by historians of philosophy and science alike. Its reputation suffered greatly under the shadow of neo-Kantianism and positivism, which had dismissed it as a form of pseudoscience. *Naturphilosophie* had its heyday in Germany from 1800 to 1830. After the rapid growth of the empirical sciences in the 1840s, however, it came under increasing criticism. It was attacked for its a priori methodology, unverifiable speculations, and disregard for experiment. Allegedly, rather than carefully limiting their conclusions to definite experimental results, Schelling and the *Naturphilosophen* sketched grand theories, resorted to farfetched analogies, and forced preconceptions on a few scanty facts. For many philosophers and scientists, *Naturphilosophie* became the very model of how *not* to do science. It indeed became "the pestilence and black death of the century."[2]

Fortunately, there is no longer much need to justify the study of *Naturphilosophie.* After the blossoming of the history of science in the 1970s, there has been a virtual renaissance in the subject.[3] There have been books, conferences, and journals devoted to *Naturphilosophie,*[4] and there are now special editions of Schelling's and Hegel's writings in the field.[5] While there are few who would defend *Naturphilosophie* as a method for doing science today,[6] it has been recognized by many as a phenomenon of fundamental historical importance for the growth of modern science and philosophy.

Unfortunately, however, the legacy of positivism remains, and the old image of *Naturphilosophie* persists to this day. Some scholars would like to distinguish between the development of modern biological science and *Naturphilososophie* on the grounds that the early biologists and physiologists eschewed the metaphysical principles and transcendental methodology of *Naturphilosophie.*[7] According to this distinction, the pioneers of modern biol-

ogy, such as Albrecht von Haller, J. F. Blumenbach and K. F. Kielmeyer, Alexander von Humboldt, and C. F. Wolff, observed Kant's regulative constraints and strictly followed an empirical methodology, while the *Naturphilosophen* flew in the face of these constraints and recklessly indulged in an priori procedure. Yet this distinction is more a positivistic construction than an historical reality. It suffers from several difficulties. First, Kant's regulative doctrine was *not* the foundation of empirical science in the late eighteenth and early nineteenth century; rather it was completely at odds with it. It is striking that virtually all the notable German physiologists and biologists of the late eighteenth and early nineteenth centuries conceived of their vital powers as causal agents rather than regulative principles.[8] Second, the fundamental program of *Naturphilosophie*—to explain life and the mind on a naturalistic yet nonmechanistic foundation—was shared by all the physiologists and biologists. Third, it is wrong to equate *Naturphilosophie* with a priori reasoning, system building, and speculation, as if it had no concern with experiment and observation.[9] Not only does this rest on a misunderstanding of the method of *Naturphilosophie,* which stressed the role of observation and experiment (see 4.4.6), but it also ignores how many *Naturphilosophen* were critical of excessive speculation and a priori theorizing.[10] The history of science needs to cast off the legacy of positivism—especially that lurking under Kantian guise—and to realize that *Naturphilosophie* was nothing less than the normal science of its day, not some freakish philosophical or metaphysical alternative to it.

Nowhere is the legacy of positivism more persistent, however, than in scholarship on German idealism. This seems paradoxical, given the conceptual distance between positivism and German idealism. But, since the Hegel renaissance of the 1970s, this scholarship has been under pressure to make its subject appear more respectable to contemporary analytic philosophy, where positivism still casts a dark shadow. Much recent Hegel scholarship, for example, has attempted to separate Hegel's "rational core" from his "mystical shell."[11] While the rational core consists in his system of categories, his adherence to the Kantian transcendental project, and whatever "arguments" can be reconstructed from his texts, the mystical shell comprises his Spinozistic metaphysics, his dialectical logic, and, worst of all, his lingering involvement with *Naturphilosophie.* Because so much contemporary Hegel scholarship still consists in the anachronistic attempt to reinterpret Hegel according to current intellectual orthodoxies, it has had more interest to conceal rather than reveal his considerable debt to Schelling's *Naturphi-*

losophie. As a result, it has failed to understand the origins and meaning of Hegel's own absolute idealism.

The purpose of the next two chapters is to examine the purpose, problem, and method of Schelling's *Naturphilosophie*. I shall argue that *Naturphilosophie* belongs to the rational core rather than the mystical shell of Schelling's and Hegel's absolute idealism. We shall find that we cannot so easily separate the epistemological concerns of absolute idealism from its metaphysics, for *Naturphilosophie* arose from the attempt the solve the problem of knowledge, and more specifically the outstanding problem of the transcendental deduction. To dismiss the metaphysics of absolute idealism and *Naturphilosophie* is simply to beg the question against Schelling and Hegel, who believed that they had no choice but to go beyond the Kantian limits to resolve its fundamental problems. Rather than attempting to interpret away Schelling's and Hegel's violation of the Kantian critical limits, it is much more important to reconstruct their reasons for doing so.

2. The Problematic of *Naturphilosophie*

Schelling's *Naturphilosophie* has often been placed outside the Kantian–Fichtean tradition of philosophy.[12] The usual justification for this historical location is that Schelling, in attempting to derive the transcendental ego from the laws of nature, self-consciously broke with some of the main principles of Kant's and Fichte's idealism. Some scholars, particularly those of Marxist loyalities, have regarded this development in a positive light, as a crucial step toward a scientific and materialist conception of nature.[13] But others, especially neo-Kantians, have seen Schelling's *Naturphilosophie* in a more negative light as a relapse into the metaphysical dogmatism of the past.[14] They complain that Schelling simply presupposed knowledge of the independent reality of nature as a whole, and so begged all the critical questions about how such knowledge is attained. But, whether by Marxists or neo-Kantians, Schelling's *Naturphilosophie* has been placed *outside* the tradition of Kantian–Fichtean idealism as a new competing development.

There is some truth to this account of Schelling's *Naturphilosophie*. Schelling did indeed self-consciously break with some of the central principles of Kant's and Fichte's idealism, and so cannot belong to the Kantian–Fichtean tradition in all respects. But this view of *Naturphilosophie*—if pushed to extremes—is also problematic. If we place *Naturphilosophie* completely outside the Kantian-Fichtean tradition—as if it ignores its main problems and disre-

gards its central values—it becomes impossible to explain the development of absolute idealism itself. It is important to recognize that Hegel's argument on behalf of absolute idealism in the *Differenzschrift* is based on his defense of *Naturphilosophie,* and consists in the thesis that *Naturphilosophie* is necessary to resolve the outstanding problems of the Kantian–Fichtean tradition. Hegel's argument makes perfect sense if we place Schelling's *Naturphilosophie* within the Kantian–Fichtean tradition; but it makes none at all if we place it outside it.

More problematically, this historical location of Schelling's *Naturphilosophie* does scant justice to its origins and context. The more closely we examine its genesis, the more it becomes apparent that its original motivation and problematic came from the Kantian–Fichtean tradition, and indeed ultimately from the Transcendental Deduction itself. Schelling's central concern in developing his *Naturphilosophie* was to devise a new strategy for solving the very problem that had so troubled Kant and Fichte: 'How do we explain that correspondence between representation and object on which all knowledge depends?' His belief in the importance of *Naturphilosophie* for epistemology came from his recognition that the answer to the question behind the Transcendental Deduction—'How do synthetic a priori concepts apply to the manifold of a posteriori intuitions given in sensibility?'—requires a broader metaphysical theory about the relationship between the subjective and objective, the noumenal and phenomenal, or the mental and the physical.

Schelling's early concern with the problematic of transcendental philosophy becomes evident from his first publication on *Naturphilosophie,* his 1797 *Ideen zu einer Philosophie der Natur.* In the long introduction explicitly devoted to the problems of *Naturphilosophie,* Schelling stated that it begins with the same fundamental problem as all philosophy: "How a world outside us, how nature, and with it experience, is possible?" (II, 12) Often Schelling emphasized that the problem of *Naturphilosophie* was to accout for not the origins of nature itself but our *consciousness* of it (II, 12, 15, 30). The goal of *Naturphilosophie,* he further explained, is to develop a general theory of nature that unifies the mental and physical according to a single idea (II, 56). Although *Naturphilosophie* underwent important changes since its original conception in 1797, Schelling always held that its main goal is identical to that of transcendental philosophy: to provide a demonstration of the principle of subject–object identity, which is the fundamental presupposition of all knowledge.[15]

The strategy behind Schelling's *Naturphilosophie* was to approach the classical problem of mental–physical interaction from the opposite direction of transcendental philosophy itself. Rather than beginning from the subject and investigating the realm of consciousness, Schelling would begin from the object and study the nature of matter itself. He recognized that the whole problem of mental–physical interaction involves the question 'What is matter?' as much as the question 'What is mind?' Schelling contended that we should not view the nature of matter as a given, as if the only mystery were the mind and its relation to matter. Rather, we have to recognize that the very nature of matter is mysterious—it is indeed "the most obscure of all things, and indeed to some obscurity itself" (II, 359).

It should be clear, then, that if we place Schelling's *Naturphilosophie* completely outside the Kantian–Fichtean tradition, we fail to see its philosophical relevance, how it became an important part of the conversation of the post-Kantian tradition regarding the solution of the problem of knowledge. If we were to summarize the relevance of *Naturphilosophie* in a single phrase, we might call it a *naturalistic epistemology,* that is, one which attempts to explain the origin and possibility of knowledge by placing the subject and object of knowledge within nature as a whole.[16] According to this epistemology, the subject's awareness of nature does not take place in some *sui generis* transcendental realm, which transcends the natural world as the condition of its possibility. Rather, such awareness is simply another expression or appearance of the powers of nature itself, so that both the mental and physical, the subjective and objective, become parts or aspects of the natural world as a whole. While Schelling at first only vaguely conceived this project,[17] he soon developed it much more explicitly, so that in his 1799 *Einleitung zu dem Entwurf eines Systems der Naturphilosophie* he writes of deriving the whole transcendental realm from nature (III, 273–274). The epistemological relevance of *Naturphilosophie* therefore consists in its attempt to resolve the classical problem of knowledge in a purely naturalistic manner.

3. Rethinking Matter

Schelling's main strategy for dealing with the mind–body problem—reconsidering the nature of matter itself—faced one serious challenge: the Cartesian account of matter as *res extensa.* This concept of matter was the foundation of Descartes' mechanical physics, and the basis for his disasterous mental–physical dualism. It was the central aim of Schelling's *Natur-*

philosophie to replace it with a new concept of matter that did not have dualistic consequences.

According to Descartes' cosmology, the nature of matter consists in extension, that is, in having a certain length, breadth, or depth.[18] Since it does nothing more than occupy space, matter is essentially inert or static, so that it changes its state only if it is moved or acted on by something else.[19] All change of motion therefore happens through impact, by one body directly exerting pressure on another, when the degree of impact is measured in terms of quantity of motion, that is, by how much the body changes place in a definite time. The causes of all events in the natural world are explained in terms of this concept of matter, in other words, by the shape, size, position, and motion of particles, and by their impact on one another; hence there is no need to refer to final causes or inner powers.[20]

The main point behind such a concept of matter was to justify the mathematical treatment of the natural world.[21] Since extension has a definite size, shape, and weight, it is perfectly measurable and calculable. The price to be paid for such a concept, however, is an insurmountable mental–physical dualism. The problem is that consciousness does not appear to occupy space, because ideas—whether as acts or objects of thought—do not have a definite size, shape, and weight. Furthermore, it becomes impossible to explain how the external world acts on the mind; for if nothing in the mind changes place, it is impossible to measure, or even think of, impact.

Though it was coming under increasing criticism in the late seventeenth century, the Cartesian legacy was still very much alive in the late eighteenth. There was no dearth of natural philosophers who attempted to explain the new phenomena of magnetism, electricity, and chemistry according to mechanical principles.[22] According to one of its leading expositors, Friedrich Albert Gren, the central principles of this mechanical physics were the following: (1) that matter fills space through its mere existence, (2) that it is absolutely impenetrable, (3) that it is not infinitely divisible, but consists in indivisible and extended particles called atoms, (4) that there are empty spaces between atoms, (5) that the parts of elastic fluids (air, heat, light) do not touch, and (6) that the hollowness or density of body depends on the number of interstices between its particles.[23] The most prominent and radical of the mechanical physicists was George-Louis Le Sage (1724–1803), who applied such principles to gravity, chemical affinity, and magnetism. He explained chemical affinity by the compatibility between the size and shape of atoms, gravity by the motions of atoms in a fluid, and magnetism by the

special affinity of two kinds of atoms in a subtle medium. Because of his prestige and uncompromising mechanism, Le Sage later became the main target of Schelling's critique of materialism.[24]

Schelling was not the first in late-eighteenth-century Germany to criticize the Cartesian legacy. The most important and influential step away from the mechanical physics came from Kant himself. In his 1786 *Metaphysische Anfangsgründe der Naturwissenschaften* Kant sketched a dynamical theory of matter to replace the traditional Cartesian concept. According to Kant, the essence of matter does not consist in extension but in moving force (*bewegende Kraft*). Extension is not the fundamental characteristic of matter, Kant contended, because the occupation of space needs to be explained in terms of something even more basic: the moving force to repel any other motion impinging on a space. Hence impenetrability is not an *absolute* quality, as if matter filled space by its very nature, but only a *relative* one, the result of the specific force by which it resists any body penetrating its space.[25]

The heart of Kant's theory of matter in the *Anfangsgründe* is his analysis of a physical body into two fundamental but opposing forces: the force of *repulsion,* by which one body causes another to go away from it, and the force of *attraction,* by which one body causes another to come close to it. These are the only two possible forces, Kant argued, because all forces express themselves in motion, and motion is representable as a line between two points, which can only approach or go apart from one another.[26] Though they conflict with one another, moving in opposite directions, both forces are necessary to matter. If matter consisted only in repulsive force, which strives constantly *to expand* its space, then it would scatter to infinity.[27] If, on the other hand, it were composed only of attractive force, which strives constantly *to diminish* its space, then it would shrink to a mere point.[28] What makes a body possible, therefore, is *a balance* between its attractive and repulsive force.

This theory of matter had a profound influence on Schelling. More than any other work, Kant's *Anfangsgründe* provided him with the conceptual basis for his own break with the Cartesian legacy. Although Schelling later became extremely critical of Kant's dynamics, it still provided most of the inspiration and impetus for his own theory of inorganic nature. In his *Ideen zu einer Philosophie der Natur* Schelling paid tribute to Kant's work by praising its analysis of matter. It is an account so perfect, he said, that it is only necessary to add some supplementary comments (II, 231).

Schelling was not, however, the first among his contemporaries to de-

velop Kant's dynamic concept of matter. That direction of thought had already been firmly established by several of his contemporaries before he began to write his *Naturphilosophie* in 1797. A. C. A. Eschenmayer, C. F. Kielmeyer, H. F. Link, and A. N. Scherer had all taken Kant a step further by applying his ideas to the growing field of chemistry, and by trying to develop a comprehensive dynamical theory to explain all the phenomena of electricity and magnetism.[29] Schelling's *Naturphilosophie* has to be placed within a broader tradition, then, situated among all those late-eighteenth-century thinkers who attempted to construct a more speculative philosophy on the basis of Kant's concept of matter. There can be no doubt that Schelling was strongly influenced by the work of Eschenmayer and Kielmeyer.[30]

Schelling's own settling of accounts with the Cartesian legacy began with his 1797 *Ideen zu einer Philosophie der Natur.* It is striking how Schelling turns the critical tools of Kant's epistemology into a weapon against mechanistic materialism. True to the regulative strictures of transcendental philosophy, he accuses the mechanists of having hypostatized the concept of matter. They reify matter when they assume that it is something in which forces inhere (*materiae vis insita*), when it really consists in nothing but these forces themselves (II, 192, 194–195). By assuming that forces of attraction and repulsion must work by immediate impact, they also confuse the transcendental conditions of experience (these very forces) with events in experience itself (II, 192, 213). Following a line of argument sketched by Kant in the *Anfangsgründe*, Schelling then attacked the atomistic tenet of the absolute indivisibility and impenetrability of matter, accusing it of setting artificial restrictions to empirical investigation. There is no limit to indivisiblity or impenetrability, he argued, since for any degree of division or compression there can always be some greater (II, 196, 201).

After criticizing mechanistic materialism on these grounds, Schelling then broadened his offensive by attacking the physics of Le Sage. The main stumbling block of this physics, he argued, is that it presupposes what it should really explain: the possibility of matter and motion. It simply assumes the existence of fundamental particles in motion, and then explains the variety of kinds of matter from the quantity and motion of their parts; but the fundamental problem is the very existence of matter, the occupation of space, in the first place (II, 208, 212). Furthermore, the mechanical physics explains the motion of a body from the impact of another acting on it, but it cannot explain the source of this impact itself, that is, why one body moves and acts on another (II, 40, 205).

But the *Ideen* is much more than simply a critique of the Cartesian legacy, a mere polemic against Le Sage's mechanical physics. The heart of the work is its attempt to provide a deeper transcendental foundation for Kant's dynamics. Schelling explained that there are two possible procedures regarding the transcendental explication of the concept of matter: an *analytic* one that begins from the concept of matter and derives its necessary conditions, and a *synthetic* one that begins from more fundamental principles and then derives the concept of matter from it (II, 214). While Schelling praises Kant for his analytic account of matter, he also thinks it is necessary to go further and determine the conditions of the possibility of matter itself.[31] What Fichte had done for the Kantian categories and forms of intuition that Schelling would now try to do for the Kantian principles of dynamics: they too were to be derived from even more fundamental principles.

The basis of Schelling's deduction is Fichte's analysis of the fundamental activities of the mind in the *Wissenschaftslehre.* According to Fichte, there are two basic activities that are completely opposed to one another: an indeterminate activity extending outward to infinity, and a determinate activity reflecting inward to a single point. These activities are necessary conditions of the possibility of having an intuition of any determinate body in space. While the first activity gives content to our intuition, the second provides it with form. Schelling now applies this analysis of the conditions of experience to Kant's fundamental forces. Attractive and repulsive force, Schelling argues, represent or objectify these two activities in our outer experience. The fundamental conditions of the possibility of matter—attraction and repulsion—then turn out to be the fundamental conditions of the possibility of any object of intuition. What we are aware of in our experience, the object in space and time, is the synthesis of these two fundamental powers (II, 214, 220, 231–234).

It is doubtful, however, whether such a deduction would have met with Kant's blessing. Kant stressed that the forces of attraction and repulsion were fundamental, and *ipso facto* could not be explained themselves.[32] Here again we can see how Fichte and Schelling pushed the search for foundations beyond the Kantian limits.

4. Nature as Organism

Since the main subject matter of the *Ideen* is material nature, Schelling did not deal directly with organic nature, and still less with the mind–body

problem. In the preface to the first edition he announced a continuation of the work that would treat aspects of organic nature, especially teleology and physiology. But this promise he never kept.

Only in the retrospective and later introduction to the work did Schelling begin to discuss organic nature and the mind–body problem. His treatment of these issues is tentative and schematic, yet central to his later *Naturphilosophie.* In the course of a rambling polemic against mechanistic materialism, Schelling suggests that the paradigm for the unity of the mental and physical, ideal and real, should be the concept of an *organism* or *self-organizing matter* (II, 44, 47). Since the idea of organization involves that of a unity of form and content, concept and object (II, 40–41, 44), and since such a unity is possible only if there is some directing intelligence or governing mind (II, 42, 47), self-organizing matter must be understood as a unity of mind and body, ideal and real. The purpose or concept of an organism must be *inherent* in the object itself, and not something imposed on it from outside, Schelling argues, because it is necessary not only for its structure or form but its very existence. Hence it is necessary to assume that there is some intelligence or reason within matter.

Very boldly but also very tentatively, Schelling generalizes this paradigm, applying it to all of nature. The unity of mental and physical in organic nature now becomes the paradigm for the unity of organic and inorganic in nature as a whole. Schelling suggests that one idea for uniting the realms of the organic and inorganic, the purposive and mechanical, is the purposiveness of nature as a whole (II, 54). This idea means that there is a hierarchy of life in the universe, and that any form of organized matter is a form of life, even if a very limited kind (II, 46).

What was a mere proposal in the *Ideen* soon became a full-blown program in Schelling's next work on *Naturphilosophie,* his 1798 *Von der Weltseele.* We can overcome the opposition between the organic and inorganic, the mechanical and purposive, Schelling argues in the preface to this work, only if we conceive all of nature as an organism. Since all attempts to explain the organic in mechanical terms have failed, there remains only the possibility of explaining the mechanical in terms of the organic. Mechanism is then simply the *negative* side of life, its lowest stage of organization and development. In a daring move, Schelling neatly reversed the usual order of explanation in seventeenth- and eighteenth-century philosophy. Rather than taking mechanism as his model of explanation and reducing the organic and mental to its terms, he makes the organic his model, seeing the mechanical

relation of cause and effect only as a manifestation of a universal organic development. In a few short sentences Schelling makes this dramatic reversal perfectly explicit:

> What then is that mechanism with which you frighten yourselves, as if with a ghost? Is mechanism really something existing for itself? Is it not rather only the negative side of the organism? Must not the organism be prior to the mechanism, the positive be prior to the negative? If in general the negative presupposes the positive, and not conversely, our philosophy cannot begin from mechanism (as the negative) but from organism (as the positive); organism is so little to be explained from the mechanism that mechanism is to be explained from organism. (II, 349)

The concept of an organism provides the root metaphor, the guiding principle, behind Schelling's *Naturphilosophie.* Schelling extends this metaphor to the universe as a whole, so that all nature is one vast organism, one living whole, which is undergoing constant growth and development. According to his organic vision, there is a single living force acting throughout all nature, and all the different species of minerals, plants, and animals, and even all the different forms of matter itself, are simply so many different degrees of its organization and development. All nature forms one vast hierarchy, which consists in the various stages of organization and development of living force. This hierarchy begins from the most simple forms of matter, passes through the more complex minerals, plants, and animals, and finally ends with the most complex forms of life, such as the self-consciousness of the transcendental philosopher and the creativity of the artistic genius.

What, more precisely, did Schelling mean by 'organism'? To understand his usage, it is necessary to go back to Kant's classic account of this concept in sections 64–65 of the *Kritik der Urteilskraft,* which Schelling closely follows.[33] Kant maintained that the distinctive feature of an organism, when it is considered as an end of nature (*Naturzweck*) rather than of art, is that it is the cause and effect of itself. Rather than being produced by causes external to itself, an organism produces itself according to ends, so that the effect of its activity can also be understood as its cause. Kant further defined this self-causing activity through two more specific characteristics. First, the idea of the whole contains and precedes all its parts, so that every part has its identity only in the whole. Second, the parts produce the whole because they are reciprocally cause and effect of one another. Kant emphasized the second feature as especially characteristic of products of nature as opposed to prod-

ucts of art. Both works of art and nature could be seen as organic wholes, because, in art as in nature, the idea of the whole precedes the parts. Unlike a work of art, however, a product of nature is *self*-generating and *self*-organizing. Rather than the idea of the whole being imposed on it by some external agency, a natural organism produces itself through the reciprocal interaction of all its parts.

Like Kant, Schelling distinguished an organism, which is *self*-causing and *self*-generating, from a mechanism, which is something produced according to external causes alone. He maintained that the concept of an organism is *sui generis*, irreducible to the laws that apply only to a machine, because mechanical explanation cannot account for the self-causing and self-generating activity of an organism. Mechanism presupposes that the series of causes and effects is *unidirectional* because no effect can react on its cause but can only be the cause of some other effect. In an organism, however, the series of causes is *bidirectional* because the effect can also react on the cause, so that cause and effect interact with one another reciprocally (II, 40–41). Although Schelling denies that an organism is reducible to a mechanism, he does not make any sharp or absolute distinction between these concepts. He does not intend to banish mechanism from the sphere of nature, and he indeed insists that it plays a necessary role in the explanation of all phenomena.[34] It's only that mechanical explanation must now be placed in the broader context of the purposiveness of nature as a whole: it is the means and medium by which organic activity realizes itself.

This organic concept of nature was Schelling's solution to the dilemma that had troubled physiology ever since the early seventeenth century: dualism versus mechanistic materialism. These extremes seemed to be the only possibilities if one adopted the Cartesian concept of matter and its paradigm of mechanical explanation. If all naturalistic explanation is in terms of motion on extended bodies, then either we place life and the mind outside nature—and so become dualists—or we reduce it down to matter in motion—and so become mechanists. But both alternatives are unsatisfactory. While the mechanist upholds the principles of naturalism, he seems to ignore the characteristic qualities of life and the mind; and whereas the dualist recognizes such qualities, he transports them into a mysterious *sui generis* realm where they cannot be explained according to the methods and principles of the new sciences.

It was the purpose of Schelling's organic theory to provide some middle path between the horns of this dilemma. Schelling agreed with the dualist

that mechanism could not explain the *sui generis* characteristics of life and the mind; but he also sympathized with the efforts of the materialist to explain life and the mind according to natural laws. The organic concept of nature alone, he believed, could avoid the problems of both dualism and materialism and provide a *naturalistic yet nonreductivistic* account of life and the mind. Since an organism is not reducible to a mechanism, it does not reduce life and the mind down to a machine; but since it also acts according to natural laws, there is no violation of the principles of naturalism. The organic concept thus calls into question the false common premise behind both dualism and materialism: that all natural explanation is mechanical. Rather than accounting for natural events by external causes acting upon them, it explains them by their necessary place in a systematic whole. The paradigm of explanation is now holistic rather than analytical or atomistic.

Schelling's *Naturphilosophie* attempts to bring life and the mind into the naturalistic world view by regarding them as aspects or appearances of living force. He refuses to regard them as *sui generis* forces or substances, as if they were somehow inexplicable according to the laws governing physical nature. Rather, he insists that they are simply the higher degrees of organization and development of the same living forces that are inherent in matter. According to his organic view, then, there is no distinction of *kind,* but only one of *degree,* between the mind and body. They are different levels of organization and development of the single living force throughout all of nature. The mental is the highest degree of organization and development of the living forces active in matter; and matter is the lowest degree of organization and development of the living forces present in the mind. We can therefore regard mind as highly organized and developed matter, and matter as less organized and developed mind. Nature is visible mind, and mind is invisible nature, by virtue of their being different stages in the development of living force.

5. Regulative or Constitutive?

Whatever its explanatory value, it is obvious that Schelling's organic theory has problems of its own. The main difficulty concerns the epistemic status of the original metaphor. Is it possible to give the idea of life a *constitutive* worth, so that we can assume that nature *is* an organism? Or is it necessary to assign it a merely *regulative* status, so that we can investigate nature only *as if* it were an organism?

Prima facie Kant's position on this question was clear and firm. It is one of the central teachings of the *Kritik der Urteilskraft* that we cannot attribute objective validity to teleological judgments that ascribe purposes to things in nature.[35] We assume that organisms act for ends only by analogy with our actions, and we have no evidence that such an assumption is warranted because nothing in our experience could possibly confirm it. We do not derive the concept of purposiveness from nature but read that concept into it.[36] This concept therefore has only a heuristic value in helping us to systematize the multiplicity of empirical laws. We should proceed in our investigation of nature *as if* it were created according to a divine intelligence since this will help us to find such systematic unity as exists; but we have no right to conclude that there really is such an intelligence or complete unity.

Although Kant himself had sketched a dynamic theory of nature in his *Metaphysische Anfangsgründe,* he was always careful to distinguish his position from any form of hylozoism or vital materialism, according to which matter has some living principle within it. In the third part of the *Anfangsgründe,* Kant had provided a demonstration of the law of inertia, which, he insisted, proves that matter is lifeless.[37] According to this law, every change in matter must have an *external* cause, such that a body persists in motion, in the same direction, and with the same speed unless there is some external cause to make it change its direction and speed. This means that there cannot be any internal or living principle in matter, something that would make it self-moving and self-organizing. We have a right to ascribe such an internal principle to a body, Kant further argued, only if we can show that it has some faculty of desire, some intention or purpose of changing its state; but experience provides no possible evidence for such a claim. As if he intended to crush all speculative impulses in the bud, Kant then proclaimed his damning indictment against hylozoism: "*der Tod aller Naturphilosophie*."

What was Schelling's response to this Kantian challenge? Initially, it was to avoid any confrontation at all, and even to concede the Kantian limits. In several passages of the *Ideen,* for example, Schelling stressed that the idea of an organism has only a heuristic value. Although it is a necessary principle of reflective judgement, it gives us no right to assume that nature itself is organized according to some design (II, 54–55). Schelling also conceded Kant's point that the idea of purposiveness involves that of a creative understanding, which cannot be demonstrated by theoretical reason (II, 42). Even in *Von der Weltseele,* where Schelling had first generalized the organic metaphor, he sometimes insists that we have no right to assume the existence of ulti-

mate powers, and that they are only useful as limiting concepts in pushing back the boundaries of explanation (II, 384, 386).

It is striking, however, that the general direction of Schelling's thought is on a collision course with Kant. Even when he insists on the Kantian strictures, he also commits himself to transcending them. This becomes apparent from his protracted polemic against both dualism and materialism in the introduction to the *Ideen,* where the upshot of his argument is that the idea of a purpose must have more than a merely subjective validity. Schelling criticizes materialists and dualists alike for their incapacity to explain the unity of form and content in an organism. We cannot separate form from content, as if form were imposed on content from the outside, whether by God or some material cause, because the form is *inherent* in the object, the conditions not only for its structure but for its very existence (II, 41, 44–45, 47). Now, Schelling reasons, if the form, the idea of a purpose, is necessary for the very existence of an object, as Kant himself concedes, then in what sense do we only read it into the object? The claim that we only project our ends into the object is implausible, Schelling suggests, because it does not explain why we do so for some objects rather than others. Surely, there must be something in the object itself that distinguishes it from the inorganic and that makes us think that it is purposive (II, 43–44). While the Kantians are right to insist that the idea of a purpose involves that of some guiding intelligence, they also must admit that, in the case of an organism, this intelligence is *within* the object itself.

Despite his methodological caution in some passages, the thrust of Schelling's organic metaphor in *Von der Weltseele* was to give constitutive status to the idea of life. In seeing matter as only the negative side of life, as its lowest degree of organization and development, Schelling had virtually embraced the very hylozoism Kant had condemned. And when he claimed that we must understand mechanism as part of a wider organic whole, he had clearly gone beyond Kant's limits by making the organic a necessary condition of causality, and so of the theoretical knowledge of experience itself. While the implications of Schelling's theory are clear, they were not drawn by him until much later. They became more explicit only after 1799 when he developed a specific methodology for his *Naturphilosophie,* and when he established a foundation for his *Naturphilosophie* independent of the *Wissenschaftslehre*.

Although Schelling himself did not provide an explicit account of his reasons for going beyond Kant's regulative constraints even after 1799, it is

easy to reconstruct why he did so. The main point is simple: the problem of knowledge could be resolved only by granting constitutive validity to teleology. Schelling's problem was to explain the correspondence between representation and object, subjective and objective, ideal and real, involved in all knowledge. Any satisfactory explanation of this correspondence required giving some account of how such apparently heterogeneous factors could interact with one another. To explain this interaction, Schelling postulated the idea of an organism, which makes the subjective and objective simply different degrees of vital activity. Clearly, however, to account for the *actual* interaction it is necessary to assume that the living powers are *in* the phenomena. To say that we have a right only to proceed *as if* they are in them is only to leave the mystery that is to be explained; we would then still not know why there is any interaction at all. Of course, Kant himself insisted that we leave the interaction a mystery, denying that we can have any insight into the single source of our faculties. But there is a clear retort to this line of argument: that leaving things a mystery does not explain the possibility of knowledge itself, which it is the purpose of transcendental philosophy to explain.

It is indeed noteworthy that Kant himself was never very clear and firm about the distinction between the regulative and constitutive himself, and that in places he came very close to the position of Schelling and Hegel.[38] Nowhere are his vascillations more apparent than in the Appendix to the Transcendental Dialectic of the first *Kritik.* Here Kant sometimes staunchly maintains that we must assume there is some systematic order in nature itself, for otherwise we would have little rationale or motivation to look for it. Proceeding simply according to an "*as if* assumption," he insists, will not be sufficient to justify or motivate enquiry.[39] Kant then blurs his distinction between the regulative and the constitutive, reason and understanding, when he states that the assumption of systematicity is necessary for the application of the catgories themselves. Without the idea of systematic unity, he says, there would not be "coherent employment of the understanding," not even a "sufficient criterion of empirical truth."[40] The same equivocation extends into the *Kritik der Urteilskraft* itself, where Kant sometimes states that we cannot have a coherent experience without the application of the maxims of reflective judgment itself.[41] In insisting that we assume the existence of intelligent design, and in making such an assumption a necessary condition of experience, of the application of the catgories themselves, Kant himself had completely violated his own distinction between the transcendental and the

transcendent. The metaphysical idea of the organic had virtually become a necessary condition of experience itself.

6. The Methodology of *Naturphilosophie*

Once we raise the question of the epistemic warrant for Schelling's main principles we immediately broach the topic of method. How did Schelling attempt to justify his principles? By what means did he claim to know them? These questions are all the more pressing when we consider that the brunt of the positivisitic campaign against Schelling was that he did not have a scientific methodology. This makes it necessary to examine Schelling's own methodology and how he attempted to defend it. Rather than condemning Schelling out of hand by positivisitic standards, which he would only have rejected, it is necessary to examine him in the light of his own philosophy of science.

After 1799, in response to growing criticisms, Schelling began to reflect on the proper procedure for *Naturphilosophie,* and he went to some pains to explain it in various passages of his works, especially in his *Einleitung zu dem Entwurf eines Systems der Naturphilosophie* and some articles in his *Zeitschrift für spekulative Physik.*[42] In reading these texts one is struck by Schelling's methodological sophistication and caution, which is all the more remarkable given his reputation for naivité and carelessness. As if by foresight, he anticipates the caricatures later attributed to him, warning the reader that is not him. He deplores the vices of speculation, especially 'formalism,' the tendency to impose simplistic ideas on the variety and complexity of facts.[43] While he does use analogies, and indeed sometimes indulges in them, he also stresses that they have only a preliminary and heuristic value, and that they should later be more precisely formulated by quantification.[44] In his earlier works Schelling insists that basic forces and ultimate units are only regulative ideas, useful fictions for guiding enquiry, which should on no account be hypostatized.[45] Indeed, he warns against postulating elemental substances, such as caloric, on the grounds that they cannot be justified by experience.[46] Finally, rather than rashly developing some general hypotheses, Schelling often advises waiting for more empirical data.

One reason for the notoriety of Schelling's *Naturphilosophie* has been its common association with vitalism, with speculation about some *Lebenskraft* or *élan vital* behind all the phenomena of nature. It is important to recognize, however, that Schelling was a sharp critic of vitalism, and took pains to dis-

tinguish his position from it.[47] Indeed, he rejected vitalism on the same grounds as many a positivist: that it postulates an occult force inexplicable by natural laws. In general, Schelling abjured all hypotheses about supernatural powers, insisting that we cannot postulate any force beyond nature because every force is finite, having its efficacy and magnitude only within a system of forces.[48] The interpretation of Schelling as a vitalist is simply too crude, failing to distinguish his theory from the many theories of life at the close of the eighteenth century.

Rather than a proponent of the occult and the supernatural, Schelling was a stout champion of naturalism, the doctrine that everything that happens acts of necessity according to the laws of nature. *Naturphilosophie* was "the Spinozism of physics," and as such its naturalism was just as uncompromising as that in the *Ethica.* Although Schelling does reject the *mechanistic* paradigm of naturalistic explanation advocated by Descartes and Spinoza, this does not mean he abandons naturalism in general. Rather, the very opposite is the case: he expressly affirms its necessity. The first maxim of true natural science, he writes in his *Einleitung,* is to explain all events on the basis of natural powers alone (III, 273). Nature is a completely self-sufficient and autonomous realm, he states explicitly in the *Entwurf,* so that everything that happens within it must be explained according to its laws alone (III, 17). In insisting on such naturalism, Schelling means to exclude several kinds of theories: (1) all references to the supernatural, such as miracles; (2) all explanations in terms of occult powers; (3) the old physico-theology, which explained all things by their place in providence; and finally (4), by 1799, any idealist explanation of nature that makes it only an instrument of self-consciousness.[49] Indeed, naturalism was so important to Schelling that it became one of the main reasons for his abandonment of the *Wissenschaftslehre.*

Another major reason for the notoriety of Schelling's *Naturphilosophie* is its method of a priori speculation. It has been severely criticized for its lack of careful induction, and for its neglect of experimentation. There is some rationale for this interpretation, since Schelling himself stressed the need for starting from a priori principles and criticized the procedure of empirical physics. But, before we pass judgement on such a method, it is necessary to understand the epistemology behind it. Why did Schelling think that the method of *Naturphilosophie* should be a priori? Why, too, did he criticize empirical physics?

In the *Einleitung zu dem Entwurf* Schelling cast some light on the first question by making some general distinctions between *Naturphilosophie* and em-

pirical physics (III, 282–283). He first distinguished between their *subject matters:* while *Naturphilosophie* treats the first causes of nature, its deeper sources, and its inner activity, empirical physics deals only with its secondary causes, its external appearances, and the results or products of its activity (III, 274–275). He then distinguished between their *methodology: Naturphilosophie* begins from a priori principles and constructs all propositions from them, whereas empirical physics begins with experience and derives its principles from them. The difference in subject matter determines that in methodology: the fundamental principles of *Naturphilosophie* have to be a priori simply because the first causes of nature cannot be given in experience itself. The central task of *Naturphilosophie* is explicitly and self-consciously *transcendental* or *metaphysical,* because its principles precede any possible experience and so cannot be derived from it.

Schelling's critique of empirical physics has to be placed within its specific historical context and understood as the critique of one specific kind of methodology: that practiced by the mechanical physics of his day. The central target of Schelling's critique, and indeed his paradigm of empiricist methodology, was the mechanical physics of George-Louis Le Sage.[50] According to Schelling, Le Sage attempted to derive his principles from experience, but he did so by constantly modifying his theory to accomodate any new data that came along; he would invent *ad hoc* all kinds of particles, shapes, and subtle media so that his theory would correspond to any kind of fact.[51] Schelling saw two difficulties with this kind of theorizing: first, it is circular, because one derives causes from effects and then effects from causes; and, second, it is constantly subject to revision whenever new data arises. The problem with empiricism, then, is not that it resorts to facts, but that it begins from them and constructs its theories *ad hoc* only in the light of them.

The ultimate basis for Schelling's a priori methodology, and his critique of empiricism, lay with his Kantian paradigm of knowledge. True to the idealist tradition, Schelling stresses the role of mental activity in cognition. We know only what we create, he says, so that all knowledge in the strictest sense is a priori (III, 276). To know an object is to determine the principles of its possibility, and to determine these is to be able to construct it, to reproduce its activity in thought (275). Schelling is confident that such a priori constructions will conform to nature itself, because he thinks that the philosopher and nature share one and the same productive reason. The principles by which nature creates its objects in reality are the same as those by

which the philosopher constructs his objects in thought. As Schelling puts it, nature too works a priori, because it brings forth all its products according to a rational plan (III, 279; IV, 530).

This paradigm of knowledge is also the foundation for Schelling's ideal of science. Like Kant, Schelling thinks that the ideal of science is a system, a complete body of propositions organized around and derived from a single principle. This ideal of a system follows directly from his concept of knowledge as construction. If to know an object is to construct it, and if to construct it is to show its place in a whole, or to demonstrate how it follows of necessity from a single idea, then the proper form of knowledge will be a system.[52] The ideal of *Naturphilosophie* will then be to express the vast multitude of phenomena in nature according to a single universal principle (III, 276).

On the basis of his paradigm of knowledge, Schelling then developed some striking views about the role of experiment in natural science. Since knowing is acting, we gain knowledge of nature not when we passively record its operations but when we actively interfere with them. Such intervention is an experiment, which is an attempt to compel nature to answer questions (III, 276). Accordingly, Schelling stresses the role of theory in the framing of experiments. We ask nature the questions we do, he argues, only because we are led by a theory. If we are without theory, we will be like those tourists who do not ask questions because they know nothing about what they see. Indeed, Schelling sometimes goes so far as to contend that facts in themselves are nothing, having their meaning and validity only in the context of a specific theory: "whoever does not have the correct theory also cannot have a correct experience, and conversely" (IV, 532).[53]

It is clear that Schelling's paradigm of knowledge and science have their origins in Kant's philosophy of nature, especially as it is expounded by Kant in his *Metaphysische Anfangsgründe der Naturwissenschaften.* That the laws of science have a transcendental or metaphysical foundation, that a discipline is a science only insofar as it is systematic, that the method of science is a priori construction, that the basic parts of natural science should be organized according to the architechtonic of reason itself, and that we make experiments according to the demands of theory—all these themes of Schelling's methodology are inspired by Kant, most of them deriving directly from the *Anfangsgründe.* Schelling differs from Kant not regarding any issue of methodology, but rather in how far he takes his methodology. Schelling attempts to take the method a step further by providing a foundation for the laws that Kant himself regarded incapable of further deduction.[54] Clearly, showing the

Kantian provenance of Schelling's methodology does not legitimate it; but the extent of Schelling's debt to Kant is remarkable considering that Kant's name is so often invoked as a talisman against the excesses of metaphysical speculation after Kant. The irony is that, more than anyone else, Kant was the father of these metaphysical tendencies.

Though it is more prominent, the a priori aspect of Schelling's methodology is only one of its aspects. For all his criticism of empiricism, and for all his insistence on a priori principles, Schelling also stresses the indispensable role of experience in *Naturphilosophie*. In reply to the criticism that *Naturphilosophie* neglects experience Schelling counters with the lines: "We know not only this or that, but we originally know nothing at all except through experience and by means of experience" (III, 278). To be sure, the *Naturforscher* comes to the facts with his ideas and questions; but that does not mean that they are only what he reads into them. While his first principles cannot be discovered by experience, they can still be falsified by it. Schelling is clear and firm that the scientist's first principles have at first only the status of an hypothesis, and that their value rests on their ability to explain the facts. The test of his principles is whether he can derive all the facts from it. If there is just a single phenomenon that cannot be derived from his principles, Schelling stresses, then it is necessary for this reason alone to reject them (277).

In the *Einleitung zu dem Entwurf* Schelling complains that it is a complete misrepresentation of *Naturphilosophie* to think that it ignores experience. Although every proposition in a system should be derived a priori, this does not mean that the *Naturphilosoph* does not consult experience to discover it in the first place. Schelling locates the source of this misunderstanding in a common confusion about the nature of the a priori (III, 278). We tend to think that the distinction between a priori and a posteriori knowledge corresponds to distinct kinds of propositions, so that it seems as if one and the same proposition cannot be confirmed by reason and discovered by experience. But the a priori or a posteriori status of a proposition attaches not to the propositions themselves but simply to our mode of knowledge of them. Hence a proposition that we first know a posteriori through experience can later become a priori by its role within the system itself (III, 278).

For several reasons, this point is of general importance for understanding Schelling's methodology. First, it shows how he thinks reason and experience are both necessary to understand phenomena. We need experience to learn about the existence and specific properties of phenomena, and reason to determine their necessary place in a system. Second, it also demonstrates

how his polemic against empiricism combines with his insistence on the role of experience in forming knowledge. The problem with empiricism is not that it appeals to facts, but that it does not give a proper a priori foundation for them, which requires showing how they relate to one another in a system. Third, it makes clear, contrary to a popular stereotype, that Schelling is not trying to deduce specific empirical laws from a priori principles without the aid of experience. The role of a priori deduction is only to determine the proper systematic order or structure of the materials gathered from experience.

If, however, the materials of a system have to be derived from experience, is that system not subject to falsification and constant revision? Schelling was always ready to concede this regarding the details of the system. He sometimes stressed that the system of *Naturphilosophie* is more an ideal than a reality, a goal for investigation that will be complete only when all the facts are fully known. But what about the fundamental principles themselves? Schelling wavered on this crucial question. Sometimes he emphasized that even the fundamental principles were subject to falsification if they did not derive all the data of experience (III, 277); at other times, however, he insisted that there could be no conflict between reason and experience, and any appearance of one only went to show that some apriori principles are not really principles of reason after all (IV, 530).[55] Aware of the distance between a priori principles and specific empirical data, Schelling held that the goal of empirical research should be not random induction for its own sake, but the discovery of those *mediating terms* (*Zwischenglieder*) between a priori principles and the multitude of empirical data (III, 280; IV, 532). Only these would be able to determine the true application and legitimacy of the principles themselves.

Such, in brief, were Schelling's methodological views. It should be clear by now that there is indeed some rationale for them, and that it is simply question begging to dismiss them by empiricist standards. Yet a question remains. While it is necessary to admit that Schelling had a clear and consistent method, did he actually practice it? Some of Schelling's fairer critics were ready to admit his methodological sophistication, and even the value of his ideals; where he went astray, they argued, is not following them. Whether this is so is best left to a close reader of Schelling's texts to judge.