

## Chapter One

### *Introduction*



#### 1.1 THE EXTENT OF MENTALITY

The term “panpsychism” has its origins in the Greek *pan*, meaning “throughout” or “everywhere,” and *psyche*, meaning “soul” as the unifying center of the mental life of us humans and other living creatures. In very general terms, the thesis of panpsychism is that throughout nature there is mentality, that the mentality of which each of us is aware in our own thoughts and experiences is present in varying forms in a wide variety of natural bodies. This thesis has been advanced in a variety of ways. Romantic poets such as Goethe, Coleridge, Shelley, and Wordsworth, in reaction against the materialistic philosophy of the eighteenth century, expressed in their writings belief in a “vital principle” present throughout nature.<sup>1</sup> The basis for this belief was immediate intuition, an immediate grasp of some animating principle. In contrast to these literary expressions, philosophic formulations of panpsychism, beginning with the writings of the ancient Greeks, have attempted to support the thesis

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1. The romantic reaction against mechanistic materialism is described in Nicholas Roe’s “Introduction: Samuel Taylor Coleridge and the Sciences of Life,” in Roe, ed., *Samuel Taylor Coleridge and the Sciences of Life*.

through reasoned arguments. These philosophic formulations and criticisms of them will be our focus here. Familiar features of our own experience and of our practices of describing other humans and animals provide a starting point for the various versions we will be considering.

It is early in the morning, and I am now looking out the window of my study as I write these words, observing animals outside—a dog lying in the driveway, a bird perched on a limb, a butterfly flitting about. I am also intermittently planning the day's activities and wondering whether it will rain this afternoon. Outside there are also workers building an addition to my neighbor's house, and I believe that, like myself, they are observing the things about them, planning the afternoon's projects, guessing the day's weather. Not only do I see and hear what is outside, plan and wonder about what lies ahead, I am also aware of myself seeing and hearing, and can report to others what I see and how things look with such sentences as "I see the cocker spaniel" and "He looks tired." I can also express to others my intentions and beliefs. This capacity for not only seeing and intending but being aware of this is what we seem to mean by our capacity for "reflection" or "self-consciousness" as a type of monitoring of what we are currently engaged in. This capacity seems to be only intermittently exercised, for many familiar sights and sounds may lie beyond the threshold at which it is brought into play. Thus, I may hear a familiar sound—say, the sound of the refrigerator nearby in the kitchen—but take no notice of it. I hear the sound, but am unaware of hearing until for some reason it forces itself into my attention. Until this forcing happens, I could not describe the sound to another. I can also intend to take a walk this afternoon without thinking about this intention right now.

These are familiar features of the experience of any normal human being. Those with whom we converse can describe to us what they see, hear, taste, smell, and feel. They can also express to us their thoughts, whether in the form of beliefs, hopes, plans, or decisions. We in turn describe the experiences and thoughts of those around us, as I might describe the workers outside as looking at the siding for the new addition or believing that it will rain in the afternoon. The verbs that make up our mental vocabulary—verbs such as "see", "hear", "feel", "believe", and "intend"—thus have uses in both the first person and third person. I say "I see a dark cloud" and

“I believe it will rain”; another says of me “He sees a dark cloud” and “He believes it will rain”. Use of mental vocabulary in this way is a characteristic of all communities within the human species, whether the hunters and gatherer tribes of the forests of Brazil and steppes of Africa or university academics. With the exception of the autistic and very young children, all humans are adept at it. The expressions “having a mind” and “having a soul” are closely associated with this vocabulary. Those that have minds (souls) are those whom we describe as seeing, hearing, feeling, and believing.

The dog outside my window does not share with me a common language. It may have been for this reason that back in the seventeenth century the philosopher Descartes refused to attribute to it a mind, regarding it instead as a machine that responds in determined ways to the objects of its environment. To have a mind for Descartes was to be the subject of such sentences such as “I see  $Y$ ” or “I believe that  $p$ ”, and the dog obviously does not qualify for this. It is outside our linguistic community, unable to use the pronoun “I”, and thus not qualifying for the title of a person. But we should regard Descartes’s division between we humans and mindless animals as only symptomatic of the hold on us of language, and reject it in favor of common sense. We do say of the dog that it sees the bone or expects its master. When we step on its tail and it yelps, we are confident in ascribing to it pain. Anatomical similarities to ourselves, the fact that it has eyes, ears, and a nose, along with similarity of behavior, the fact that it behaves in a way like the way we behave when our foot is hit by a heavy object—all of this seems to justify our ascription of pain. The dog may not be reflectively aware of having a pain or expecting his master, but we are confident it does feel and expect, and in this more restricted sense has a mind or soul.

We thus both share a fundamental feature with lower animals, the capacity for sensations, and are different from them in our inclusion within a shared linguistic framework. Self-consciousness is generally assumed to be unique to the human species with its linguistic capacities, though some have speculated that it can be extended to mammals such as dolphins and chimpanzees with developed signaling systems. As we shall presently see in the next chapter, Aristotle used the term “soul” (the Greek *anima*) for the capacity for unreflective experiencing, while reserving “mind” (*nous*) for members of our human linguistic communities. On the

basis of this distinction we find philosophers such as Aquinas and Leibniz following Aristotle in granting immortality to humans but denying it to lower animals.

Using a variety of signaling sounds and gestures, many of us socially interact with pets and domesticated and laboratory animals, assessing whether they are in pain, what they expect, and what they want, using much of the same mental vocabulary that we apply to our fellow humans. Just as we apply “pain” to the yelping dog, we apply “pleasure” to the purring cat we are stroking and verbs such as “see” and “hear.” Making such descriptions is an essential part of our care for such animals. Hunters and fishermen also assess what animals might sense—what the bass might see as the lure passes by, what the deer smells or sees as they are approached. To make any mental ascription is in some measure to adopt the standpoint of what is being described, a kind of projection into their perspectives. In making their ascriptions, then, both caregivers and predators alike are able to take the perspective of members of infrahuman species.

But as we descend down the phylogenetic scale to organisms whose anatomy and behavior is very different from our own, we find it more difficult to apply mental terminology with confidence. Though spiders have eyes very different from ours, we would probably describe them as seeing their prey. But do earthworms experience tactile sensations? And how do we describe the experiences of a flea? An amoeba as a single-celled organism exhibits learning behavior, for when presented with a toxic substance on repeated occasions it learns to reject it more quickly in later trials than in earlier. Learning behavior is also exhibited by bacteria orienting themselves within a liquid solution, though like amoebas, they lack detectable sense receptors. In such cases, we may attribute primitive feelings and experiences of light. But given the dissimilarity between the anatomy of these creatures and ourselves, should we extend mentality to such creatures?

The problem of deciding such cases is often stated as the problem of determining the advent of consciousness during the evolutionary process. It is assumed that in the early stages of the evolution of the universe there was bare matter. Then at some stage through the forces of natural selection there evolved in some organisms the totally novel capacity for being conscious. Before this transition, “the lights were out” in the darkness of the material

processes described the physicists. After it, “the lights came on” with the introduction of consciousness, and have gradually brightened in intensity, culminating in the streams of consciousness characteristic of members of the human species. But exactly at what stage did this remarkable transition take place? To this there have been a variety of answers. Some have chosen to restrict consciousness to mammals. Others have restricted it to animals and insects with detectable sense receptors, including honey bees and spiders, for example, but excluding fleas and earthworms. Still others have been more generous, and on the basis of the exhibition of learning behavior included fleas, earthworms, and amoebas.

This manner of posing the question in terms of consciousness presents difficulties, however. Despite our best efforts, the term “consciousness” carries with it the connotations of the related term “self-consciousness”, implying the kind of reflective awareness and monitoring characteristic of our own stream of consciousness. This has led some writers to date the advent of consciousness at a relatively late evolutionary stage. The term “consciousness” also implies the having of sensations in one or more of the sense modalities of sight, hearing, taste, smell, and touch. This has the effect of automatically excluding organisms such as bacteria and amoebas that lack sense receptors analogous to those in mammals. The choice of terminology also has the effect of ruling out panpsychism as a viable hypothesis. For these reasons, it seems best to forego the use of the term “consciousness” in assessing the panpsychist thesis, though the term was widely used in the nineteenth century formulations that are included in chapter 7, and continues to be used today. Accordingly, we formulate the panpsychist thesis without mention of consciousness as:

Mentality as the having of a qualitative perspective on an environment is present in all natural bodies with unity of organization and the capacity to maintain themselves against potentially destructive environmental forces.

Alternatively, we can say that all unified, self-maintaining natural bodies are not simply objects out there to be observed by us, but have what Sartre calls “being *en soi*,” sharing at least with us and other animals the having of some perspective or other, however different this may be from that enjoyed by ourselves. Because of this

difference, the form of this perspective may not be something we can imagine, but it can be conceived by progressively subtracting from the forms of mentality we are directly aware of in our own experience. Zero mentality, its total absence, is asymptotically approached as we descend to the most primitive natural bodies at the earliest stages of evolution, but never absent in natural bodies having the requisite unity of organization. Mentality in this generalized, abstract sense is not necessarily the capacity for consciousness characteristic of more complex organisms, that is, it does not require either reflective awareness or the having of sensations through one or more of the sense modalities. The effect of this formulation is to extend the panpsychist thesis to natural bodies more primitive than sentient organisms, thus making possible its application to molecules and atoms, indeed to any natural body meeting the required conditions. As we shall see, this is the formulation of the thesis found in the writings of Leibniz (chapter 5) and the process philosophers Whitehead and Hartshorne (chapter 8). It should be noted that in this form the thesis does not apply to rocks, crystals, planets, and galaxies, which lack unity of organization, or to artifacts like bottles or computers, which are not natural bodies sharing the same evolutionary history with ourselves and other sentient organisms.

Even with these restrictions, however, the thesis offends against common sense. We are willing to attribute mentality to dogs and cats, and may reluctantly attribute it to spiders and fleas, but most will surely reject outright the application to bodies more primitive than single-celled organisms such as amoebas and bacteria. To claim that there is something to being like a molecule or atom seems to be an invitation to enter the realm of the absurd. Are the justifications for panpsychism in the selections that follow sufficient to overcome this initial reaction? Are they sufficient to warrant for it our acceptance, or is its only basis the emotional satisfaction to be found in the belief that we belong within a system of nature that shares some fundamental aspect of ourselves?

## 1.2. OBSTACLES TO THE ACCEPTANCE OF PANPSYCHISM

There are indeed considerable obstacles in the way to justifying panpsychism, not the least being its conflict with common sense.

The lesson learned from twentieth-century “ordinary language” philosophy is that conflicts of this kind are linguistic in nature, and this lesson has an obvious application to the panpsychist thesis. As noted above, the primary use of mental words is in relation to those around us. A sentence such as “I have a pain in my foot” is typically used to solicit aid, while the third-person “He has a pain in his foot” may be used in providing care. Other words like “see”, “hear”, and “believe” are used to coordinate with and control others. A sentence such as “He believes that it will rain,” for example, might be used to anticipate the actions of someone, and perhaps to evaluate the belief and correct a mistake. We readily extend words such as “expect”, “see”, “hear”, and “smell” to animals under our control or who are hunted, again often with the purpose of anticipating their movements and, at least in the case of domestic animals and pets, extending care. We are more hesitant for other creatures, though where behavior and anatomy exhibit some similarity to domestic animals and pets we do continue to apply mental words. In section 9.3 below, we shall find Wittgenstein contrasting the oddity of applying “pain” of a stone to its application to a wriggling fly with a pin stuck through it. In the case of the fly, he says, “pain seems able to get a foothold here, where before [for the stone] everything was, so to speak, too smooth for it.” It seems to be anatomy and behavior that provides the basis for this contrast.

Advocates of panpsychism in the selections to follow extend their thesis to natural bodies much more primitive than insects, and it is this clash with normal uses with mental terminology that seems to provoke rejections by their opponents. Mentality is present, we think, where words such as “pain”, “pleasure”, “see”, and “hear” have a use. But they obviously do not have any application—or lack a “foothold,” as Wittgenstein expresses it—to such objects as the individual cells of a human body or the molecules and atoms of which these cells are composed, and for this reason most philosophers have followed common opinion in rejecting the panpsychist thesis.

But such considerations, while they may provide an explanation of the resistance we feel toward the thesis, fails as a justification for its rejection. No responsible advocate of panpsychism claims that atoms or molecules have pains or pleasures, or indeed any of the sensations associated with specific sense modalities. Abstraction

is made from those experiences we have and can imagine to the conception of a qualitative perspective as the common core of what we characterize as “mentality.” This generalization extending beyond our ordinary uses of mental language allies this philosophic thesis with extensions of ordinary language found in mathematics and the sciences. Mathematics originated with words such as *triangle* describing an observed shape. It then formulated precise definitions of such terms as “triangle,” “equilateral triangle,” and “isosceles triangle,” and generalized from them to develop the concepts of triangles in Euclidean and non-Euclidean spaces. Physics generalized from familiar macroscopic objects to the conception of “material body,” and described these bodies in ways that increasingly diverged from descriptions of familiar objects. In similar fashion, panpsychism starts with the familiar mental vocabulary we use in daily life and then constructs the abstract conception of mentality in general. Just as for mathematics and physics, associations with the familiar can mislead and create confusions. The remedy for these is special attention to the meanings given to terms such as “mentality” and “qualitative perspective” and the reasoning advanced in favor of the panpsychist thesis. It can no more be dismissed on the basis of ordinary language and common sense than can conclusions of the theoretical sciences that conflict with the familiar.

Another obstacle to the acceptance of panpsychism is presented by the fact that it has been associated with dualist views of the nature of mentality that most philosophers now reject. The term “soul” used by some of the philosophers in our sampling of formulations suggests to us a mental substance distinct from a publicly observed body. Leibniz’s eternal “monads” of section 5.2 that are present throughout nature are certainly understood as such substances distinct from the material bodies investigated by the sciences; indeed, their persistence after the death of the body requires this. Later in the nineteenth century we find writers such as William K. Clifford (see 7.2) advocating a version of dualism in the form of psychophysical parallelism. Alfred North Whitehead (8.1) and Charles Hartshorne (8.2) in the twentieth century replace the traditional soul with a sequence of causally related mental events of limited duration called “actual occasions.” The psychic causation between these events is used by David Griffin (in section 8.3) to develop an alternative to dualism that is claimed to solve the mind-



body problem. But the positing of two types of causation, one psychic and metaphysical, the other physical and investigated by the sciences, seems as implausible as the forms of dualism it is designed to replace.

This association with questionable metaphysical views can be overcome by simply acknowledging that the doctrine of panpsychism is itself not tied to any specific metaphysical view of the nature of mentality. Everyone must recognize that there is *some* difference between a sentient creature with a qualitative perspective such as an insect or crustacean, on the one hand, and a stone or artifact such as a bottle, on the other. The panpsychist thesis should be regarded as stating only that the distinctive feature of this sentience, whatever it may be, can be extended to bodies more primitive than living organisms. Whether the distinguishing feature is the possession of substantial soul, a mental process paralleling physical processes in bodies, or a locus of a sequence of mental events are questions that themselves have no bearing on the truth of the thesis. One can deny that the mental is distinct from the physical states and processes studied by the natural sciences and still count oneself as an advocate of panpsychism. There are some who think—I happen to be one of them—that the categories of our language are inadequate to state the relationship between the sensations and feelings of which we are directly aware and the physical processes within our bodies, and that there is therefore no solution to what is labeled the “mind-body problem.” If this were so, there would still remain for us the problem of deciding whether or not to accept the panpsychist thesis.

Still another obstacle to acceptance is the association of the thesis with belief in the existence of a unitary form of mentality present throughout the extent of the universe, the God of early Christian theology, or the Being in Itself of twentieth-century revisions of this theology. Most of the major advocates of panpsychism shared some form of this belief, including Leibniz, Gustav Fechner, Whitehead, and Hartshorne, and it is principally through them that the association has been made. Those finding no rational basis for the religious belief have then concluded that panpsychism is infected with its same implausibility.

But this association is simply an accident of its historical development within cultures with monotheistic beliefs. As we shall

see in chapter 3, the Tiantai school of Buddhism advocated a version of panpsychism without such beliefs, and this demonstrates that the panpsychist thesis stands on its own, and is logically independent of the claim that mentality can somehow be attributed to the universe as a whole. Indeed, if panpsychism were true, this would undermine one of the principal arguments for God's existence, namely the argument first advanced by John Locke (considered below in chapter 6) that the eternity of mentality requires the existence of God as eternal mind. Further, one of the principal arguments for panpsychism, as we shall presently see in the next section, is based on analogies between behavior and structures within infrahuman creatures and those of the human species. But while such analogies provide a plausible basis for extending mentality to the infrahuman, the universe as a whole seems to lack that unity of organization characteristic of organic bodies. If strength of analogical reasoning is any measure, the justification for panpsychism would seem to be far stronger than that for the existence of a universal mind. To be sure, this justification is far from being conclusive, and acceptance of panpsychism seems finally to require introducing a type of faith akin to that of traditional religions. Nevertheless, it seems to be a reasonable faith, one consistent with science and common sense, and in this respect has the advantage over doctrines encumbered with past superstitions.

Finally, it is widely thought that to accept panpsychism is to reject the use of the scientific method and to deny to the sciences their proper role of describing and explaining natural events. Leibniz was careful to distinguish his version of panpsychism from the science of physics, and noted that panpsychism as a metaphysical theory was "useless for physics" (see section 5.2). But he exercised fewer scruples with regard to biology by employing the concept of an "entelechy" and suggesting that biological development can be explained by a mental agency outside the scope of the sciences. The later introduction of the "vital principle" of the Romantics into biology was to prove a block to scientific inquiry, and was repudiated only after much controversy. This association with a discredited chapter in the history of science undoubtedly influenced criticisms in the twentieth century such as those of Paul Edwards (section 9.1) and Karl Popper (9.2). The implausibility of such claims, which have been identified with panpsychism, has led some to reject the doctrine itself.

There is no need, however, for advocates of panpsychism to advance their theory as a competitor to any of those provided by the natural sciences. Progress in the natural sciences is indeed blocked by attempts to introduce causes that cannot in principle be identified by empirical methods. On these grounds it seems reasonable to require panpsychism to eschew any claims to *explain* the course of natural events. Its more modest goal would seem to be that of *understanding* the scheme of nature in terms of the familiar everyday experiences that we are aware of in our daily lives. Such an understanding renders appropriate attitudes of identification and concern for the infrahuman that the mechanical explanations of behavior of the sciences themselves cannot provide.

In the selections to follow we find several arguments developed in defense of the panpsychist thesis. Two of these are of central importance: (1) an analogical argument for extending the mentality characteristic of our own species to infrahuman forms of natural bodies, and (2) what we shall refer to as an “origination argument” that is based on the difficulty of providing an evolutionary explanation of the origination of mentality.

### 1.3. ANALOGICAL INFERENCES

The analogical argument can be found in the writings of Leibniz, Fechner, Hartshorne, and recently David Chalmers (Section 11.1) and Gregg Rosenberg (11.2). Fechner provides its clearest formulation. It is criticized below by Paul Edwards (9.1). It begins with the obvious fact that we have mental capacities, that is, the capacities for feeling, having sensations, and what we broadly refer to as “thinking”—making judgments about what is the case, deciding what to do to influence the future, and appreciating or deprecating what we encounter around us. We also know the features of human anatomy, and can observe the behavior of both ourselves and others. Now we know that lower animals are similar to us in many respects, including the possession of a common evolutionary past, similar genetic and physiological structures, and common behavioral patterns. We then infer by analogy that because of these historical, structural, and behavioral similarities infrahuman creatures are also similar to ourselves in possessing mental capacities. These

capacities are clearly less developed than our own. The more dissimilar to ourselves are the structure and behavior of a given natural body the more attenuated is its mental capacity, and at some stage of primitiveness we can only conceive of its bare presence. Advocates of the generalized panpsychist thesis justify attributing attenuated mentality by extending this analogical reasoning to primitive forms that share with us only the features of a common past, being unified wholes with specialized parts persisting through time, and a capacity for maintaining themselves against the potentially destructive effects of an environment.

The nature of this justification can be understood by considering the form of an analogical inference. This typically assumes the existence of two populations  $A$  and  $B$  whose members are respectively  $a_1, a_2, \dots, a_n$  and  $b_1, b_2, \dots, b_n$ . We assume that both  $A$  and  $B$  share some attributes  $P_1, P_2, \dots, P_n$  in common and that  $A$  has the further attribute  $Q$ . We then infer to the conclusion that population  $B$  has  $Q$  also. An analogical inference is thus of the form

$$\begin{array}{l} A \text{ and } B \text{ are } P_1, P_2, \dots, P_n \\ A \text{ is } Q \\ \text{Therefore, } B \text{ is } Q \end{array}$$

The attributes predicated of the populations  $A$  and  $B$  by  $P_1, P_2, \dots, P_n$  constitute the *base* of the analogy, while  $Q$  expresses the *projected attribute*. Alternatively, an analogical inference can be described as the *analogical extension* of the predicate  $Q$  from  $A$  to a population  $B$  sharing with it a common base. For example, suppose we have a barrel of apples all of which are red and ripe and come from the same orchard (the base  $P_1, P_2, P_3$ ). We cut open half of them (the population  $A$ ) and find they are rotten inside (the projected  $Q$ ). We may then infer by analogy that the other half of apples ( $B$ ) are also rotten, or that the adjective “rotten” can be extended from  $A$  to  $B$ . The larger the number  $n$  of attributes in the base  $P_1, P_2, \dots, P_n$  that are shared by  $A$  and  $B$  the stronger the inference, provided the shared attributes are relevant to the possession of  $Q$  by  $B$ . Size and shape of apples do not themselves seem relevant to their rottenness in the way that coloration, ripeness, and common origin are. Therefore, if the only attributes shared by the apples were their being all large and round, the inference to rottenness would be weaker.

Besides strengthening an analogical inference by increasing the relevant attributes of the base shared by  $A$  and  $B$ , we can achieve the same effect by making more indefinite the projected  $Q$ . The conclusion that members of  $B$  are all rotten is fairly specific, and needs the support of a reasonably large number of relevant attributes. But we could choose as our  $Q$  the much more indefinite attribute of having some defect or other. The conclusion that  $B$  is a  $Q$  would then require much weaker premisses, perhaps only the observation that both  $A$  and  $B$  are from the same barrel. In this way, making more indefinite  $Q$  allows reducing the inference's base. We thus have two ways of strengthening an analogical inference: either increase its base or make more indefinite the projected attribute.

We are aware of our own thoughts and feelings. How do we know that others around us also have thoughts and feelings? The "argument for other minds" has provided an answer. It begins with the observation that when we are aware of having a certain experience we observe it to be combined with a characteristic form of behavior. For example, when I experience a sharp pain in my foot I may commonly grimace, hold my foot, and hop around. I then notice that another person is exhibiting similar behavior, and infer by analogy that this person is also experiencing pain. Here I am  $a$ , the sole member of the population  $A$ , the other person is  $b$ , and the base  $P_1, P_2, \dots, P_n$  are the observed behavioral similarities between the two of us. The inference is then made that because I experience pain ( $Q$ ),  $b$  does also. We may be aware only of our own sensations and feelings, but because these are accompanied by behavior that we also observe in others, we think we are justified in attributing these experiences to others.

For those mental ascriptions we apply to members of our own species, inferences seem irrelevant, and this has led to questioning the argument for other minds. Often we base our ascriptions to another of a certain belief or desire directly on the basis of what he or she says, as when someone says "It will rain" and we attribute to this person the belief that it will rain. We do this without comparison to a belief state of which we are aware. As Wittgenstein (see section 9.3 below) and Gilbert Ryle (9.4) have noted, even where behavior is the basis for our ascriptions, there seems to be a direct, noninferential judgment. I see a man on the balcony of a tenth floor apartment cautiously staying away from the railing, and judge he is

afraid of heights. But this does not seem to be the result of an inference in which I notice similarities between my behavior and his, know that I am experiencing fear when I behave in such a way, and conclude he does also. I do not regard his cautious behavior as *evidence* of some unseen fear in the person out there. Rather, his behavior would seem to constitute *criteria* for ascribing fear. The term “fear” means for us, at least in part, what I see before me, and for this reason I can directly apply the term.

For infrahuman creatures, however, the situation seems very different. I see a recently caught fish flopping around on the deck of a boat. Is it experiencing pain? The fact that we can raise this question and have some initial uncertainty of its answer indicates that the flopping does not constitute criteria for applying the word *pain*. We may conclude that the fish is in pain, but this seems to be only after an analogical inference in which we first compare the flopping to the writhing behavior of those humans we describe as being in pain, and then judge they are sufficiently similar to warrant the analogical extension of “pain” to the fish. Our inference seems to have the following form: Both humans and fish exhibit behavior that is similar in relevant respects. Humans exhibiting this behavior are in pain. Therefore, the fish is also. Clearly, the greater the anatomical and behavioral similarities between members of infrahuman species and our own species the stronger the analogical inference. The yelping dog that has just had its foot stepped on is more likely to be in pain, we think, than the flopping fish.

There thus seems to be a common form of analogical inference applied both in extending “rotten” to apples in a barrel and “pain” to fish. But we should not be misled into overlooking differences between the extension of standard descriptive predicates and mental predicates. An obvious one is that there is always the possibility of independent confirmation of conclusions reached in the standard cases. We can, after all, cut open the unexamined apples to determine whether they are in fact rotten. In contrast, the *only* possible basis for concluding that the fish experiences pain are the similarities of anatomy and behavior. For our fellow humans we can ask what they feel, but in the absence of a shared language with lower species, there can be no independent confirmation of our analogical extensions.

Another contrast exists for the meaning of the predicates being projected. We have been assuming that the term used to express the

projected Q of an analogical inference has a meaning fixed by agreed on criteria of application. This is certainly true of the adjective “rotten” when applied to the populations of apples. But this assumption does not seem to apply to “pain” as extended from human applications to dogs and fish, for here we lack agreement on criteria of application. Our uncertainty about applying the word “pain” to the flopping fish seems not only to be due to the tentativeness of the analogical inference being employed, but includes also the lack of a fixed meaning for “pain”. Whether the term should be applied seems to be as much a matter of a *practical decision* on our part about the term’s application as the acceptance of a warranted conclusion. This aspect of our use of mental words becomes the basis for the dispute between realism and nominalism discussed below in section 1.5 and by Thomas Nagel in the selections that constitute chapter 10.

It is important to remind ourselves again of the difference between the thesis of panpsychism and specific extensions of mental predicates. Panpsychism as a philosophical doctrine does not attribute any specific experiences to members of this or that species. Its claim is instead that mentality in general, that is, the having of a point of view, a perspective on things with a qualitative aspect, can be attributed to all natural forms having an appropriate level of unified structural organization that maintain themselves over a period of time against their environments. This conception of unity of structural organization can be traced to Aristotle’s conception of “substantial form” as a principle of unity. We shall see in section 5.1 how Leibniz borrowed this Aristotelian principle in his early formulations of panpsychism in which he distinguished substantial unities from aggregates. There are many differences between creatures such as dogs and fish for which there are behavioral and anatomical similarities to ourselves and molecules and atoms where these similarities are absent. But dogs, fish, molecules, and atoms at least have in common unity of structural organization and self-maintenance of this organization, and this becomes the basis for an analogical inference to the presence of mentality in the most primitive of natural bodies.

It is obviously a weak inference, however. This is seen by considering our barrel of apples where we are attempting to determine the rottenness of unexamined apples. Suppose the only attribute the apples share is simply that they are apples in the same barrel, with

variation in color, ripeness, and origin. Then if we find that the half we examine are rotten, we would have a very weak analogical inference to the conclusion that the remainder are also. We have seen how in attributing mentality we start with ascriptions we make to others of our species on the basis of behavioral and anatomical criteria. The fewer the respects in which behavior and anatomy of other species is similar to ours, the more tentative the inference, as for our more confident attribution of pain to the yelping dog than to the flopping fish. Where we lack sense receptors and apparent self-locomotion, as for inanimate suborganic forms, we are left with only unity of organization and homeostasis as common features. With such a minimal base, the inference becomes very weak. Moreover, we are given no convincing reasons for thinking that these remaining features are in themselves relevant to the attribution of mentality. They may be, but why they are remains to be explained.

The reply of panpsychism is that a weakness due to an inference's limited shared base can be offset by making more indefinite the projected attribute. As we saw, by changing the projected attribute from rottenness to simply having some defect or other, with nicks and bruises as well as rottenness qualifying as defects, we offset decreases in similarity between the apples. In this way we generate a considerably stronger analogical inference, even if we continue to begin with the premiss that the only shared feature is being an apple in the barrel. As noted in the previous section, panpsychism does not claim that macromolecules with the appropriate unity of organization have pains or pleasures, nor indeed that they have any sensations whatsoever. The claim is only to the very indefinite conclusion that these primitive bodies have *some* form of mentality or other, that they have their individual perspectives on things with *some* qualitative aspects. This perspective may include only minimal traces of feeling that may arise during brief intervals and the presence of only intermittent spontaneity interrupting long periods of unfeeling dormancy. The indefiniteness of this conclusion helps to offset the lower number of relevant similarities in the inference's first premiss.

Even with these qualifications, however, it must be conceded that analogical reasoning provides an inconclusive basis for the panpsychist thesis, for it requires a controversial judgment of what is a relevant similarity for a generalized attribution of mentality. Many



will question whether only unity of organization persisting over time and homeostasis are themselves sufficient to extend mentality to primitive natural bodies. And how do we determine whether the requisite organization is present? Do all molecules have it, or only some? And if some, which ones? We cannot claim unity of organization when mentality is present, for this would constitute circular reasoning that assumes the conclusion being reasoned to. For this reason, we find that under the influence of evolutionary theory writers in the nineteenth century began supplementing analogical reasoning with reasoning of a different kind.

#### 1.4. THE ORIGINATION ARGUMENT

The origination argument has been used by several advocates of panpsychism, including Clifford (see section 7.2) and Friedrich Paulsen (7.4). It appeals to difficulties raised by attempts to solve the problem of explaining the origination of mentality on the basis of evolutionary theory. These difficulties come under the heading of what is referred to as the “generation problem” by William Seager in section 11.3. William James seems to have added his support to this argument, though in his early writings he refuses to endorse panpsychism, as we shall see in section 7.3. Criticisms of the origination argument by Edwards and Karl Popper will be considered below in sections 9.1 and 9.2.

For some writers, notably Daniel Dennett,<sup>2</sup> there is no generation problem, as standard accounts of evolution can explain how mentality was introduced. According to this standard account, for a certain period following the Big Bang with which the universe originated there was only bare, inanimate matter without the faintest trace of what we describe as mentality. About a billion years after the formation of our planet there evolved on it living organisms capable of self-reproduction and metabolic processes that exploited the energy resources of their environments. At some stage in the evolution of these organisms—perhaps at the very earliest, though we can make only the wildest guesses about this—some of these organisms developed the capacity for those primitive forms of feeling

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2. See his *Darwin's Dangerous Idea*, chs. 3, 7.

that we identify with mentality. Such a development can be explained, it is argued, by chemistry and Darwin's theory. Natural chemical processes produced combinations of molecules that eventually became self-replicating organisms, and self-replication made possible evolutionary advances. Random mutations in the genetic material of these organisms eventually generated organisms with primitive mental capacities, conferring on them a selective advantage for survival. As a consequence, the genes of those with this advantage would then have been transmitted to their progeny, and in this way mentality would have established itself among certain organic forms. Later more advanced forms would have similarly established themselves by the advantages their mental capacities conferred on them as occupants of varying ecological niches. In this standard account, mentality was an "emergent" property of certain natural bodies in the evolutionary process, one that appeared at some point in time in much the same manner that wings and fins made their debut at some stage in birds and fish.

This standard account is challenged by panpsychism's origination argument, and the challenge is based on several difficulties with this account. The first is that to claim that mentality is an emergent property leaves us with an unexplained mystery. Emergent properties can be contrasted with what are called "resultant" properties, those properties of wholes that can be deduced from the properties of their constituent parts. The solidity of a crystal can be deduced from the properties of its constituent atoms and the bonds existing between them. Similarly, the temperature of a container of water can be deduced from the kinetic energy of its constituent H<sub>2</sub>O molecules, and hence temperature is a resultant property of liquids such as water. One form of explanation in the natural sciences consists of deriving the laws and properties of larger wholes from the laws and properties of more primitive elements. If mentality is indeed an emergent property of some wholes, and not a resultant property, this form of explanation cannot be applied to it.

This requires advocates of the standard account to appeal to the type of explanation provided by evolutionary theory in terms of chance mutations and natural selection in the manner of our explanation of the emergence of wings and fins in birds and fish. It is conceded that we may not be able to derive the psychological laws holding of certain organisms from the laws of physics and chem-

istry. We can at least explain, however, the emergence of mentality in the same terms as we explain the emergence of any other novel feature in organic evolution.

Consider, however, the first blip of feeling that is postulated to have occurred by this standard account back sometime between one and three billion years ago. Would it have conferred on the organism having it an evolutionary advantage? It is difficult to see how. If this first blip were a bare feeling, sufficient unto itself without any relation to an environment, then it would not enable the organism to navigate within its environment, and thus would not seem to have survival value. Let us grant, however, that it did enable differential responses to environmental objects, enabling differentiation, say, between nutrients and toxic substances. Mechanical substitutes for this type of sensitivity exist in the form of thermostats and light detectors. Why did evolution not produce such mindless mechanical sensitivity devices in nature? These zombie-like devices would have been at least as efficient in enabling the organism to maintain itself in its environment as would the first organisms with the capacity for primitive feelings. And if such zombie-like devices had obtained a selective advantage in transmitting their genes, why did evolution not produce increasingly more sophisticated versions of them with more flexible responses to changing different environments? We shall find David Chalmers in section 11.1 restating the panpsychist thesis in terms of information processing throughout nature. Human artifacts such as computers and servomechanisms process information, though they lack the qualitative perspective that we believe is present in dogs and fish. There seems no reason why evolutionary processes should not have produced organic equivalents of such mindless information processors. The presence of a qualitative perspective in itself would not seem, therefore, to convey an evolutionary advantage.

Some may be willing to concede that, given our present state of knowledge, answers to these questions are not forthcoming, but will remain confident that in the future the natural sciences will explain how and why mentality originated. But such confidence is surely misplaced. Of course, we presently have speculative explanations of this origination. The difficulty is that any such explanations must remain speculative; there is *in principle* no means of constructing hypotheses providing the explanations that are empirically testable in a way that would ensure consensus within the scientific community.

That this is so becomes evident when we realize we cannot even conceive of the form that these explanatory hypotheses might take. Let us assume that chemists can assemble the molecules required for living organisms, and can artificially produce an organized body capable of metabolism and of reproducing itself. Let us also assume that this body exhibits learning behavior. Does it also have a qualitative perspective? How is this to be determined? Analogical reasoning is normally applied to make such judgments. But in this case there is a striking dissimilarity to those organisms to which we do attribute mentality, namely, the fact that this body as a human artifact lacks the common evolutionary history of the natural bodies that constitute the base of the analogy. There seems no reason to weight this dissimilarity less heavily than the simulated behavior.

All acknowledge that the panpsychist thesis is itself a speculative hypothesis. This acknowledgement has the advantage of at least its honesty over the pseudo-explanations of emergence provided by some evolutionary biologists with philosophic interests. It also has the advantage of freeing ourselves from unanswerable questions. If mentality has always existed, there is no need to explain how and why it originated. The situation can be compared to the eternal existence of matter. If matter as energy is indeed eternal, as required by the principle of the conservation of energy, then there can be no explanation possible of how it came into being. In this sense, the question "Why is there something rather than nothing?" is senseless, though we may be able to explain the different forms eternal matter has taken, explain, that is, why atoms were formed from particles, molecules from atoms, why the galaxies, stars, and planets evolved. In the same way, if mentality has always existed in the most primitive of natural bodies, there is no possible explanation of how and why it came into being, though we may be able to explain why it has made the transitions from more primitive forms to the forms characteristic of us humans. And so panpsychism would seem to have at least the advantage of avoiding fruitless searches for answers that cannot in principle ever be given.

### 1.5. EPISTEMOLOGICAL ISSUES

The nineteenth century assumed that the panpsychist thesis was one on which different sides could be chosen, pro or con, and meaning-