THE STORY OF THE MIND: PSYCHOLOGICAL AND BIOLOGICAL EXPLANATIONS OF HUMAN BEHAVIOR

by Marya Schechtman

Abstract. Persons have a curious dual nature. On the one hand, they are subjects, whose actions must be explained in terms of beliefs, desires, plans, and goals. At the same time, however, they also are physical objects, whose actions must be explicable in terms of physical laws. So far no satisfying account of this duality has been offered. Both Cartesian dualism and the modern materialist alternatives (reductionist and antireductionist) have failed to capture the full range of our experience of persons. I argue that an exciting new approach to this difficulty can be found by considering developments in clinical psychology. The clinical debate between those endorsing biological models of mental illness and those endorsing psychodynamic models mirrors broader debates in the philosophy of mind. The possible resolution of this debate through the development of integrated psychobiological models suggests a promising way to reconcile the dual nature of persons in a far more appealing way than any yet proposed.

Keywords: dualism; materialism; mind; mind/body; person; philosophy of mind; psychobiology.

Questions about what kinds of creatures we are and where we fit into the natural order are of longstanding human interest. In particular, the questions of whether we are essentially physical beings, unproblematically a part of the natural order, or psychological subjects who somehow transcend our physicality has a long history in both the academic disciplines and popular thought. This question has arisen in an especially compelling form within the context of modern clinical psychiatry, where developments in the biological understanding and treatment of mental

Marya Schechtman is Associate Professor of Philosophy at the University of Illinois at Chicago, Department of Philosophy (M/C 267), 1421 University Hall, 601 South Morgan Street, Chicago, IL 60607-7114. Her E-mail address is marya@tigger.uic.edu. This article is based on a paper that Schechtman presented at the Forty-First Annual Conference of the Institute for Religion in an Age of Science (IRAS), "Knowledge Most Worth Having in the Decade of the Brain," at Star Island, New Hampshire, 30 July–6 August 1994.

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illness have recently challenged traditional understandings of psychiatric disorders as resulting from psychodynamic forces, leading to a more biologically based view of human nature.

I argue that the standard move from developments in clinical psychiatry to a biological conception of mental illness is overhasty. The data usually offered in support of this move do not, I claim, clearly support the biological view but instead suggest a much subtler, more interesting, and more radical psychobiological approach that has potentially profound implications for broader metaphysical questions about the nature of persons and their minds. I begin with a brief overview of the philosophical debate. Next, I look at the same issues as they play themselves out within clinical psychiatry and outline the standard argument for a biological model. I then argue that the data better support a psychobiological alternative to the two received models and trace out some of the metaphysical implications of adopting this alternative as a more general view of human nature.

THE METAPHYSICAL CONTROVERSY

The central challenge facing philosophers of mind is to understand the nature of mind and its relation to body. Human beings have a curious dual nature. On the one hand, they are psychological subjects who act from reasons and passions, in accord with their beliefs, values, and desires. On the other hand, they are physical presences—objects composed of essentially the same elements as all physical objects and moved by essentially the same forces. The question is how to reconcile these two aspects. Insofar as persons are considered psychological subjects, their actions must be explained in terms of features of their psychological lives. But insofar as they are considered physical beings, we must assume that the movements of their bodies, understood as physical events, can be explained in the terms of the physical sciences. Human beings, then, are creatures to whom two different explanatory schemes can be applied, and some account is required of how we are to understand this fact.

One obvious way of thinking about the two aspects of persons is a dualism of the sort defended by Descartes. Descartes famously believed that the two elements of human nature were the result of the intermingling of two different kinds of stuff. Human beings, he says, are composed of two distinct substances—an immaterial, extensionless mind, which is the psychological subject, and a body, which is a mere physical machine, completely subject to natural laws. Thinking and conscious experience occur in the mind, but in terrestrial existence, the mind is intimately connected with the body it inhabits. Descartes says, "nature . . . teaches me . . . that I am not merely present in my body as a sailor is present in a ship, but that I am very closely joined and, as it were,

intermingled with it, so that I and the body form a unit" (Descartes [1641] 1988, 116). A fundamental feature of that unity is the fact that mind and body interact causally—what happens in the body affects the state of the mind and vice versa. That this is so is something that is shown constantly by our everyday experience—light falling on the retina causes an image in the mind; damage to the body causes the mind to experience pain; the mind's decision to utter a certain sentence results in the appropriate motions of the vocal chords; the decision to leave causes the locomotion of the legs, and so on.

Descartes's view is in many respects extremely attractive. One of its most compelling elements is the way in which it captures our pre-philosophical intuitions about ourselves. We do experience ourselves as having mental and physical elements, and as Descartes says, experience does teach us that these two affect one another on a regular basis. In the end, however, Cartesian dualism suffers from very serious difficulties. Ironically, one of the most deadly of these comes from the very feature of the view that makes it so intuitively appealing—its assumption of psychophysical interactions.

Since mind and body are supposed to be radically different kinds of substance on Descartes's view, it is not clear how they are able to affect one another. Even more worrisome is the way in which mind's influence on body seems to contradict the assumption that the body is a purely physical object. As such, it should be subject to all of the laws of physical science—one of the most fundamental of which is that all physical events have physical causes. It should be possible to give a complete account of why some physical event occurred in terms of the physical state of the world prior to the event, and that state should be completely explicable in terms of the state prior to it, and so on. Although it may be impossible in practice to actually trace back the causes of some occurrence, we must assume it is possible in theory. This assumption is, however, threatened by the claim that mind and body can interact causally. If the cause of a physical event is sometimes a choice or decision made in an immaterial mind, then that event will not be explicable in physical terms; the causal chain, traced backward, will end in a spontaneous mental event, and the physical sciences cannot be a closed explanatory system. These and other difficulties have made Cartesian dualism seem untenable to most.

In the contemporary philosophical discussion, substance dualism generally is considered to be more or less thoroughly repudiated, and some form of scientific materialism usually is assumed as a starting point. Scientific materialism avoids the difficulties of substance dualism by holding that there is only one type of substance—material substance—the kind that is defined and described by the physical sciences. On this

view, persons do not have minds that are separate entities; they have only bodies, which are entirely subject to physical laws. This approach certainly avoids the problems raised by assuming a causal interaction between different kinds of substance, but the scientific materialist is left with the challenge of explaining the way in which a body alone can have the psychological aspect that is definitive of human life. Materialism seems on the surface simply to leave this element out.

There have been two major strategies to meet this challenge. The *reductionist* approach simply rejects the claim that persons have a psychological aspect over and above their physiology. This approach holds, roughly, that physiological investigations of the human brain are increasingly providing the resources to *replace* psychological explanations with physiological ones. The kinds of events and actions that we used to believe were caused by emotions, desires, and reasons will, this view claims, instead turn out to be caused by electrical and chemical activities in the brain. Talk of psychological causation, on this view, has served as a sort of placeholder or shorthand during our ignorance of the physiological underpinnings of human behavior. Once our understanding of the brain advances, the view continues, we will be able to replace these naive protoscientific accounts of behavior with more precise, scientific ones. Although we may find it useful to continue to employ psychological terms, the view goes on, we will in principle be able to eliminate them entirely without losing any information. The spirit of this position is summed up quite bluntly by Francis Crick when he reveals his "Astonishing Hypothesis"—"that 'You,' your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules" (Crick 1994, 3).

The *antireductionist* approach, by contrast, maintains that there is an irreducibly psychological aspect of human existence, despite the fact that persons are no more than physical bodies subject to physical laws. On this approach, persons are like nations, clubs, or economies—abstract descriptions of physical objects and events that rely on a different taxonomy from that of the physical sciences. To describe events in the history of a nation, we would certainly not use the categories of the physical sciences; and although most things that act as money are physical objects, we cannot understand them *as* money, or see what they all have in common, by looking at their microstructure. These facts do not, of course, imply that national events have no physical cause, or that money is an immaterial thing—they simply show that for some purposes an abstract or functional perspective is more useful than a physical one.

The most widely used analogy in this regard is the hardware/software

distinction. The mind, antireductionists say, is like software running on the hardware of the brain. The level of software, although constrained by the hardware on which it will run, is distinct from it. Fortunately, one can learn a great deal about how to use a particular computer program while knowing little or nothing about the physical events in the computer on which it is running. A software problem is not a hardware problem and requires a different kind of attention. None of this means, however, that software requires anything over and above the physical hardware on which it runs. Each event that happens when I am using Wordperfect—for example, a character disappearing from the screen—does have a completely sufficient explanation in terms of electrical events within the computer. Nonetheless, it also can be explained as happening because I executed the *delete* command. There is no *conflict*, antireductionists argue, in the fact that two different kinds of explanatory schemes can be applied to computers. Similarly, they say, persons' movements can be explained in terms of their beliefs and desires or in terms of their physiology, and this does not cause a conflict either.

For the antireductionist, then, the physical and psychological aspects of persons coexist happily side by side as different levels of explanation, whereas for the reductionist, the psychological level is to be dispensed with in favor of more precise physical explanations as they become available. These represent the two major approaches to defining mind in contemporary philosophy of psychology. Each has been well argued and well developed, and there are many highly sophisticated versions of both views around. There is, however, something fundamentally unsatisfying about each.

The reductionist approach seems simply to leave out important information. Even presuming we could come up with a complete physiological account of the loop from a man's brain to his legs that makes him run, being told that his is trying to catch the 5:15 so he can be in time to pick up his children provides information that the physiological story cannot. A great deal of what seems crucial about human beings is missing in the reductionist account. The problem with the antireductionist picture is the extreme wedge that it drives between the psychological and physiological levels. In order for this approach to work, the level of psychological explanation needs to be kept entirely distinct from that of physiological events. When I ask people how to do a mail merge, or to insert text, they will not give me an intricate description of the workings of the computer; and no one would try to explain the drop in the dollar's value in terms of the microphysical properties of dollar bills. On the anitreductionist approach, then, there is no direct interaction between different levels of description. This is not, however, the way we experience the relation between the physical and the psychological. As I have

already pointed out, in life, psychological and physiological events seem to affect one another all of the time. The extreme autonomy of different levels of description in the antireductionist view thus does not ring true either.

Neither of the two major proposed views of mind is, in the end, entirely satisfying. They have, however, been seen as the only real alternatives, and so most discussion in the philosophy of mind has been directed toward refining one or the other of these approaches. It is possible, however, to find the promise of a third and more satisfying alternative. The debate we have been discussing in the philosophy of psychology is recapitulated in a somewhat more specific and practical form within modern clinical psychiatry. Considering the issue as it is raised there points the way toward a new approach to questions of mind and its relation to body.

THE CLINICAL DEBATE

The goal of clinical psychologists is to understand and alleviate the symptoms of mental illness. Persons who suffer from psychological disorders act in ways that are difficult to explain and feel emotions whose origins are unclear. Psychologists thus endeavor to provide an account of what causes the behaviors and affect that are so disruptive to individual lives. Currently there is a lively debate between two very different approaches to this problem—one that employs psychodynamic explanations and the other a medical approach. This controversy, as we shall see, mirrors the broader division between reductionsts and antireductionists.

For many years after Freud, psychodynamic models offered the predominant explanations of mental illness, and these models still inform a great deal of psychotherapy. The fundamental basis on which these views are built is Freud's insight that seemingly bizarre or inexplicable actions and emotions can be understood in more or less the same terms as ordinary ones if we allow that not all elements of a person's psychological life need be conscious. Slips of the tongue, bungled actions, instances of forgetfulness, and bizarre psychological symptoms should be viewed, Freud says, not as meaningless blips within an otherwise comprehensible life, but as actions that stem from the same kinds of motivations as those which are more straightforwardly comprehensible.

On this view it is a combination of beliefs, desires, values, and goals that leads to these bizarre or unusual behaviors, just as it is such a combination that leads to quite ordinary ones; the difference lies in the fact that in the latter case all of the relevant motivating factors are on the surface, whereas in the former, some of them are repressed or unconscious, hidden from view. Freud thus starts with the assumption that

every psychical fact has a psychical explanation; the difference is just that in some cases one needs to dig deeper to find it than in others. To understand a symptom or other anomalous act, one must work backward, asking what kinds of goals, beliefs, emotions, or desires would make sense of it. These then can be attributed to the subject—whether or not the subject is aware of them—on the basis that the subject's actions and emotions cannot be explained otherwise. It is a simple inference to the best hypothesis.

This is, of course, an oversimplification of Freud's position; but it is representative of his basic assumptions and should sound quite familiar. By now we are all well acquainted with the kinds of explanations this sort of account generates. The woman who insists she wants to go to medical school but somehow cannot quite get around to completing her applications, or fails to put correct postage on them when they are done, or misreads the application deadlines, will be diagnosed as having an unconscious aversion to a career in medicine. She may sincerely believe that she wants to be a doctor, but her actions say otherwise.[1] Similarly, the man who insists he wants to get married and settle down, yet always falls in love with women who are in some real sense unavailable, will be said to have an underlying fear of commitment. The dissemination of this basic Freudian insight through popular culture has, for better or worse, made all of us comfortable with the assignment of hidden motives, wishes, and emotions.

There have, of course, been a great many developments within psychoanalytic theory since Freud's time, and there are very few people left who accept the Freudian view in all of its details. Nonetheless, the basic insight—that unusual and puzzling behaviors should be explained in terms of (conscious and unconscious) psychodynamics—is the basis of most forms of talk therapy, as well as much of our everyday understanding of ourselves and one another. The defining feature of this approach is the assumption that all psychological acts are meaningful, and so all can be accounted for in purely psychological terms. To explain a person's behavior on this view is to tell a story about a combination of beliefs, desires, values, and emotions in which the behavior in question makes sense. As Freud puts it, "the task is then simply to discover in respect to a senseless idea and a pointless action, the past situation in which the idea was justified and the action served a purpose" (Freud [1917] 1966, 270).

Recently, however, this model has been challenged widely, and a controversy has arisen within clinical psychiatry that has also found its way to popular culture. The challenge is based on developments in biological psychiatry that have led many to conclude that psychological symptoms may not always be meaningful after all but instead are often the result of

abnormal brain activity. Over the past few decades, the development of sophisticated imaging devices and other technologies has allowed researchers to make a number of discoveries that indicate a strong role for biology in the production of psychological symptoms. Correlations have been found between specific brain abnormalities and particular psychological illnesses; evidence has been amassed for genetic factors in a number of illnesses; and there have been some spectacular successes in quickly relieving stubborn symptoms by directly affecting brain chemistry. These and similar findings have led many to conclude that the symptoms are not to be explained in terms of unconscious drives or desires at all but rather in terms of neurochemical activity in the brain.

The trend toward biological explanation in psychiatry has become well known to the general public through a number of popular works that have argued for the replacement of the psychodynamic paradigm with a medical one. Two representative examples of this genre are Nancy Andreasen's *The Broken Brain* (1985) and Judith Rapoport's *The Boy Who Couldn't Stop Washing* (1989). Andreasen, for instance, tells us that

> psychiatry is in the process of undergoing a revolutionary change and realigning itself with the mainstream biological traditions of medicine. During the past ten to twenty years, the neurosciences have produced an explosion of knowledge about how the brain works, and this has taught us that many forms of mental illness are due to abnormalities in the brain structure or chemistry. Psychiatry is moving from the study of the "troubled mind" to the "broken brain." (Andreasen 1985, viii)

In discussing the three major competing models of mental illness—the psychodynamic, behavioral, and biological—she says that the last of these is characterized by the fact that it holds that "[psychiatric] diseases are caused principally by biological factors and most of these factors reside in the brain" (Andreasen 1985, 30). And that "mental illnesses are not caused by bad parenting or bad 'spousing'" (Andreasen 1985, 31).

Judith Rapoport's book narrates her own conversion to the medical perspective during her experimental work treating sufferers from Obsessive-Compulsive Disorder (OCD) with Anafranil. Trained with a classical Freudian model, Rapoport says, she expected OCD to be traceable to unconscious conflicts—the compulsion to wash, for instance, caused by unconscious feelings of guilt linked to unconscious wishes. However, she reports, the discovery of abnormalities in the basal ganglia and frontal lobes of OCD patients, together with the successes of Anafranil in alleviating their symptoms, led her to reject that model. Although she once presumed that at bottom there was an unconscious psychological thought responsible for occurrences of OCD, Rapoport says, "I now know that most of our patients will never find the 'hidden' thought" (Rapoport 1989, 99). The reason, of course, is that she no longer believes that one exists. She now believes, she says, that "the evidence for a

biological cause [of OCD] is compelling . . ." (Rapoport 1989, 17). She tells us that "Tourette's disease is almost certainly a disease of the basal ganglia. I have come to believe that Tourette's disease and Obsessive-Compulsive Disorder are two sides of the same neurobiological coin" (Rapoport 1989, 93). Rapoport's further account suggests, like Andreasen's, that overall the most recent clinical data point toward a biological model of not only OCD but most of the syndromes we describe as mental illness.

Perhaps the most famous of the recent popular arguments for the biological perspective is Peter Kramer's best-seller *Listening to Prozac.* Kramer's treatment of these issues is (in ways that will be discussed shortly) quite a bit more complex than Rapoport's, but it is substantially similar in general form. Kramer, too, reports that he started from a classical psychoanalytic perspective but was won over to a biological model by watching the action of a drug. The effects of Prozac on the patients to whom he prescribes it are so profound, Kramer says, that he cannot help but believe that their problems are primarily biological rather than psychodynamic. In fact, Kramer argues, the action of Prozac has convinced him that not only pathological behavior but ordinary behavior, too, demands a biological explanation.

This conclusion comes from his observation of what he considers to be the personality-altering effects of Prozac. Kramer's fascination with Prozac comes not so much from its efficacy as an antidepressant as from the way in which a substantial minority of patients who take it become, in the words of one patient, "better than well." Prozac not only alleviates the depression or other pathological symptoms of this group of patients but substantially alters their personalities, turning shy, sensitive, serious, timid personalities into extroverted, self-assured, risk-taking, fun-loving, happy people. Early in the book Kramer describes a dilemma Prozac raises for him. Having prescribed Prozac for "Tess," who comes to him with diagnosable depression, he witnesses the dramatic personality change described above. After a while he takes Tess off the medication, as is standard practice. Her depression does not return, but she reverts to the more introverted and serious personality she was before taking the drug. She tells Kramer that she prefers the way she was on Prozac and asks him to represcribe it. This inspires Kramer to reflect not only on the ethics of prescribing medication when there is no diagnosable illness—what he calls "cosmetic psychopharmacology"—but also on what these effects of Prozac show about the essential nature of the self.

He concludes that the personality-transforming possibilities of Prozac have profound implications for how we must conceive of ourselves. He tells us that "when one pill at breakfast makes you a new person, or makes your patient, or relative, or neighbor a new person, it is difficult

to resist the suggestion, the visceral certainty, that who people are is largely biologically determined" (Kramer 1993, 18). As these drugs become more widely used, he believes, a widespread change in perspective will follow quickly. The change in self-conception that Prozac will engender, he says, "is not just a matter of 'taking biology into account,' as if one can maintain old ideas about behavior and personality and tack on a separate biological point of view. Medication has a pervasive influence, changing the way we see people and understand their predicaments. Its impact is especially apparent in the work of psychotherapists" (Kramer 1993, 285). Accepting a biological explanation of psychopathology leads quickly to accepting a more general biological explanation of human psychology, and this in turn makes us look like very different kinds of creatures from what we may have thought ourselves to be.

The psychodynamic model thus holds that a great deal more of our behavior is meaningful than we may at first have thought. Actions that seem random or inexplicable are assumed, on this view, to have a hidden meaning. The biological model, on the other hand, holds that much less of our behavior may be meaningful than we had thought. Rather than an expression of thought processes—conscious or unconscious—our behavior will turn out to be instead the result of neurochemical interactions in our brains and bodies. It should be clear, therefore, that the psychodynamic model is essentially an antireductionist view of mind, whereas the biological model is essentially a reductionist one. The former assumes that whatever we are made of, psychological events are to be explained in terms of other psychological events; the latter assumes that psychological explanations can, in theory, be replaced with biological ones.

Although the biological model seems to be more or less carrying the day, a great many loyal supporters of the psychodynamic model remain. It is difficult to reach a definitive resolution of the conflict because, as in the more general case, neither model is entirely satisfactory, since neither alone seems able to account for the full range of data. The kinds of empirical data that are amassed in favor of a biological model are powerful, and it seems impossible that the successes of medical psychiatry can be explained without recognizing a role for biology in the genesis of psychological illness. At the same time, however, the role of psychodynamic factors cannot be denied either. There are, for instance, a number of well-known psychological reactions to particular kinds of histories. Persons who have been abused as children, raised in an alcoholic home, abandoned by a parent, or brought up in extreme danger, have quite typical pathologies—pathologies that often make good psychological sense given the persons' backgrounds. It is decidedly unconvincing to claim that these pathologies are caused entirely by physiological abnormalities and have nothing to do with the psychological traumas these

individuals have suffered. Clearly psychological factors play some role in producing these symptoms.

The data cannot, furthermore, be easily explained by saying that in *some* cases the symptoms are caused by physiological factors and in others by psychodynamic factors, because the two often are copresent in one and the same patient. Patients whose psychological history seems clearly to explain their symptoms often respond well to medical treatment, and those who display the physiological abnormalities associated with a given illness usually do much better when drug therapy is combined with talk therapy than when it is administered alone. What the data really seem to suggest is that usually neither biological nor psychodynamic factors alone are enough to account for psychopathology, and that what is required is a model that integrates the two.

I suggest that the way toward such a model is shown by the very data that are used to support the biological approach. These data actually suggest a possibility much more radical and interesting than the biological model—an integrated psychobiological account of mental illness. Moreover, there is reason to hope that the basic principles behind this integrated model can be expanded to yield a more general view of the relation of mind to body that provides an attractive alternative to the reductionist and antireductionist views described above.

THE THIRD ALTERNATIVE

The information necessary for us to see the basic contours of an integrated psychobiological model of mental illness can be found, ironically, in Kramer's defense of the biological view. Indeed, Kramer says so much to point to this alternative account that it is not clear that it is entirely fair to paint him as a supporter of the biological model. His rhetoric certainly suggests that he is, but the biological story he presents is so closely connected to psychodynamics that it is not obvious where he stands in the end. For our purposes, however, it is less important to discover Kramer's own position than to uncover the resources he gives us to construct an alternative to the psychodynamic and biological models, so I put the question of Kramer's position to one side.

Much of the material that is important for the present discussion comes to the surface when Kramer discusses the very intriguing case of "Lucy." To the extent that Kramer holds a biological view of mental illness, he holds an especially subtle one in that he fully acknowledges the existence of data that seem to support a psychodynamic model. He therefore recognizes that in order to make a biological model tenable, he must give some explanation of why symptoms that seem to be caused by psychological trauma should be viewed as biological in origin. Lucy comes to Kramer because she is "boy-crazy." She finds herself taking

unreasonable risks to promote questionable relationships and is inordinately sensitive to any small sign of rejection from the men with whom she is involved.

The most immediately salient information about Lucy's background is that she had a major trauma in her past. When she was ten and living in a foreign country, she came home to find her mother murdered by a trusted servant. Kramer runs through a litany of the accounts of Lucy's symptoms that a psychodynamic psychotherapist might offer. He says that such a therapist "may see Lucy . . . as suffering from father hunger, mother hunger, adolescent rebellion, repetition compulsion, or a delayed grief reaction. Each of these very different frames is historical: to 'understand' Lucy's behavior is to place it in relation to her traumatic past" (Kramer 1993, 68). But Kramer himself ultimately comes to the conclusion that Lucy is really suffering from a physical ailment. He says that "certain people are physiologically wired to be deeply sensitive to rejection" (Kramer 1993, 71). He believes Lucy's difficulty "was . . . grounded in a functionally autonomous emotional sensitivity whose biological encoding had something to do with serotonergic neurons" (Kramer 1993, 102).

Kramer acknowledges, however, that the influences of Lucy's traumatic past cannot be denied. Her behavior, he says, has "obvious roots in her reaction to the murder of her mother" (Kramer 1993, 102). He admits that she has "clear psychological cause for suffering and self-injurious social behavior" (Kramer 1993, 105). The question, then, is in what sense the cause of Lucy's symptoms can be said to be biological rather than psychodynamic in origin. Kramer answers this difficult challenge by insisting that the immediate cause of Lucy's distress is a biological problem involving serotonin levels but allows that the cause of the biological problem may have been her psychological trauma. The problem that she now has—the problem that should be treated—is thus physical, but it is a physical problem with a psychological origin. This move gives him a means of understanding Lucy's difficulties biologically while still allowing some role for her psychological history.

To make this approach work, however, Kramer needs to provide an answer to a question he raises at the end of his discussion of Lucy's case: "How does psychic trauma become translated into a functionally autonomous, biologically encoded personality trait? How can a mother's death become a change in serotonergic pathways?" (Kramer 1993, 107). His response to this question is extremely interesting—and highly speculative. He begins by describing the kindling phenomenon with respect to epilepsy. It has been found that electric shocks that cause epileptic seizures in monkeys actually change their brain anatomy in such a way that

it takes less of a stimulus to cause a second seizure, and less still for a third. This process can be iterated until brain anatomy is altered to the point where seizures occur spontaneously. Kramer speculates that a similar mechanism may lie behind mental illnesses such as depression. A traumatic event, he believes, may induce a major episode of depression, and this may change brain structure in such a way that it takes less external provocation to cause a second depressive episode. This process too, he suggests, may be iterated to the point where there is a functionally autonomous biological depression whose episodes can be brought on with no immediate psychological cause because of the physical features of the brain.

Using a number of human and animal studies, Kramer suggests further that different individuals may be born with varying physiological vulnerabilities. A biologically vulnerable person may experience life as more traumatic and so move more quickly into the spiral that results in depression. With a particularly benign upbringing, he speculates, such an individual may escape illness. On the other hand, he supposes, even a person blessed with a robust brain physiology may become ill through the effects on the brain of especially traumatic events. This picture of the interaction between physiological and psychological factors can thus explain why some people seem to be more or less born ill, whereas others seem to be made ill by their histories.

The details of Kramer's suggestion are, as he freely acknowledges, far from proven. His suggestion does, however, have the attractive feature of speaking to all of the data—explaining how both childhood trauma and brain chemistry can be involved in a person's illness. It is also able to allow that in some cases a mental illness is caused almost exclusively by brain chemistry, in some almost exclusively by psychological trauma, and in most by a mixture of the two, which is just what we observe. There is, moreover, a great deal of exciting new research supporting the basic intuitions behind this view. It has long been known that events in the brain can have a profound impact on a person's psychological functioning and makeup—this is abundantly clear on the basis of all of the well-documented cases of the effects of brain lesions, accidents, and neurological disorders on psychological functioning. There is, however, a growing body of evidence showing that the direction of causation goes the other way as well—that psychological states or events can have a profound influence on brain functioning and architecture. It thus seems just as possible for negative thought, or ridicule by one's peers, or constant fear to reconfigure the brain in a way that predisposes a person to depression as for a congenital defect in the serotonergic pathways to cause negative thought, sensitivity, or anxiety.

Kramer, we have already seen, seems to endorse a simple biological

model of mental illness when he sums up his views. The picture he paints, however, is really of a far more complex, psychobiological view. It is unfortunate that Kramer himself does not acknowledge this more fully, because the integrated approach that can be gleaned from his discussion has implications far different from those of a simple biological model. If Kramer's suppositions about the origins of psychological illness are correct, they have the interesting consequence that *both* psychological and physiological factors *must* be brought into play to provide a complete explanation of someone's psychological distress. It might be the case that from the point of view of immediate questions of treatment the most important factors to attend to are sometimes biological ones (and even this is not clear). But once it is acknowledged that psychological factors can influence anatomy and vice versa, the broader explanatory game is changed, and it becomes clear that a purely biological view will necessarily be incomplete as a full-blown account of how persons come to have the symptoms they have. If something like Kramer's model is correct, not only must individuals' physiology be known in order to understand the state of their psyches, but their psychological history must also be known in order to understand the state of their brains. It may be the case, for instance, that an understanding of Lucy's brain functioning is essential to understanding the immediate cause of her sensitivity, but an understanding of her grief and horror at her mother's death is necessary in order to understand why her brain functions as it does.

What is important to realize is that this is meant in a quite literal sense. To make this account work, the psychological features involved must be understood as psychological features. I say this because it may be tempting to try to view the psychobiological model as, at bottom, just a slight modification of the biological view—a different way of expressing the same information. This would involve the claim that what are described as psychological causes in these accounts can always be explained in physical terms. We say that Lucy's shock and sorrow at her mother's death caused the changes in her brain, for instance, but what are her shock and sorrow? These, too, it may be argued, are physical states of her body. And what is the discovery of her mother's death? It is a series of sensory images—sights and sounds. It is thus, this argument would conclude, *theoretically* possible to turn the psychobiological account into a purely biological one, although it may be more efficient and less awkward to continue to refer to some physical events in psychological terms.

In the end, however, this approach will not work. It is crucial to Kramer's account that psychological features have their causal role as psychological features. The kinds of explanations he suggests make sense only when we are assuming that it is fear, or sorrow, or rejection, or

anger that alters the brain. The words "I guess that's the last time I'll be seeing you" have one meaning when uttered by the doctor giving a clear bill of health after a course of treatment for a terrifying ailment and quite another when uttered by a spouse leaving after a failed attempt at reconciliation. If we are to understand why the former utterance causes brain changes linked to happiness, and the latter causes changes linked to depression, we need to know that the first case is a case of relief and the second of loss and rejection. This is information that is lost at the biological level.

Kramer's account of the origins of psychological illness thus seems to involve irreducibly psychological elements and to give these elements a role in explaining not only other psychological features but also states of the brain. This radical—and attractive—move has the promise of broader implications for the more general problems in philosophy of psychology that we have been discussing. I conclude with a brief discussion of these.

THE IMPLICATIONS OF THE THIRD ALTERNATIVE

The psychobiological approach toward the explanation of mental illness described above can be expanded to provide a more general psychobiological account of human behavior that is a promising alternative to both the reductionist and functionalist views described above. This generalization is, to a large extent, already present in Kramer's discussion. In speculating about the way in which biological and psychological factors conspire to produce personality traits and behaviors that are pathological or unpleasant, he makes it quite clear that he believes nonpathological or ordinary behaviors are caused in the same way. The same mechanisms that are responsible for causing depressed, anxious, or introverted personalities are, on his view, also responsible for creating relaxed, happy and extroverted ones—it is just a question of whether one is exposed to benign or pernicious influences.

The most salient difference between this new approach and the reductionist and antireductionist approaches described earlier is that on the new approach, the biological level of explanation is not left intact as a closed and independent means of accounting for human behavior. The reductionist view, for instance, holds that psychological factors are unnecessary for explaining human behavior, and that biology alone will suffice. The functionalist view acknowledges the need for both biological and psychological explanations but sees these as entirely separate from one another. There are, on this view, two explanatory schemes—a biological one and a psychological one. The biological level is not altered by what happens on the psychological level, any more than the electrical laws operative within a computer are influenced by what happens at the

level of software. According to both the reductionist and antireductionist views, then, biological explanations can and should be conducted without appeal to psychological facts.

As we saw at the end of the last section, however, the psychobiological account implies that we often must make reference to facts about persons' goals, beliefs, desires, thoughts, and feelings to explain why the brain is in some particular state, just as we often need to make reference to states of the brain in order to explain why persons think, desire, or feel as they do. On this view, psychological events can and regularly do impact and alter the functioning of the brain, so a complete biology will need to include reference to thoughts, feelings, beliefs, and desires as well as to the traditional elements of biological explanation.

In this respect, the psychobiological view is most like Cartesian dualism. Because Descartes allowed causal interactions between mind and body, his view, too, entails the conclusion that an explanation of certain states of the brain would need to include states of the mind. As you will recall from the first section, this aspect of Descartes's view is at the same time one of its most attractive and most troubling features: It is intuitively appealing but seems to contradict the assumption that scientific explanations should be closed and complete. It would indeed be useful, therefore, if somehow the psychobiological view were able to capture the appealing aspects of Cartesian dualism while avoiding its problematic elements. The question is: Does it really manage to do so?

At first blush it seems that the psychobiological alternative I have suggested falls prey to exactly the same difficulties that Descartes faced. The defining feature of this view is the very element that was so deadly to Descartes's view—the consequence that biological explanation as we know it cannot be complete and independent. The psychobiological view thus does not overcome the objection raised against Cartesian dualism by finding a way to include psychophysical causation without disrupting traditional scientific explanations. What it does do, however, it provide a better justification for revising our conception of what a biological explanation looks like than Descartes did. Descartes not only allowed for psychophysical causation, he also had a very mechanical and reductionist view of science. For him a scientific account of the body's movements had to be mechanistic and couched in terms of fundamental laws of science that are applicable to all matter. The imposition of psychological causation on the biological realm thus seems arbitrary and self-contradictory within the Cartesian system.

The assumption of psychophysical causation, however, comes from a quite different source and takes quite a different form in the psychobiological view I have been advocating. In this instance it is not the presupposition of a realm outside of science but the progress of science

itself that leads to the conclusion that psychological and biological factors must be interwoven to give the best account of both human behavior and brain functioning. Moreover, because the hypothesis of psychophysical interactions comes out of modern empirical work, there is more information about the mechanisms by which they take place. Instead of Descartes's vague suggestion that the mind and brain interact somehow through the pineal gland, there are very detailed observations about the ways in which fear, depression, or danger, for example, affect specific parts of the brain. The interaction between psychological and biological events is thus not nearly so mysterious in the new psychobiological view as it was in Cartesian dualism.

More important still is the fact that the new psychobiological view is not a traditional substance dualism. Cartesianism holds that there are two kinds of substances, operating according to different rules, which somehow interact with one another. The new view, by contrast, starts with the assumption that there is only one kind of substance—material substance—and in trying to determine the laws according to which it acts, it determines that those laws must contain both physiological and psychological terms. This is not so much a challenge to biological explanation as a revision of our concept of what such an explanation looks like. What we seem to be learning through neuroscientific research is that biological accounts of the brain may turn out to require such terms as *beliefs*, *desires*, and *feelings*, as well as *neurons*, *synapses*, and *serotonin*.

This expanded view of biology in turn offers the glimmerings of a new and more satisfying way to think about the dual aspect of personhood. Descartes conceives of the two elements of persons as distinct entities—mind and body—which touch at a point and so interact. In rejecting the Cartesian view and moving toward scientific materialism, modern philosophers have left us with only matter. Since the conception of matter they employ is essentially the same as Descartes's, scientific materialism is generally taken to deflate our conception of persons. If persons are thought of as essentially material objects, ultimately subject to physical laws, the elements of human existence associated with mind or spirit—agency, choice, personal responsibility—seem compromised or threatened. An expanded biology would, however, necessarily change our conception of what it is to be a material being subject to biological laws. Matter would no longer be exclusively the dead substance envisioned by Descartes, nor would scientific explanation be a collection of sterile mathematical laws. This new view may thus have the consequence that we are material beings, but it radically alters our conception of what that means and leaves open the possibility of recapturing a great deal of what we thought would be lost by accepting such a claim.

The view of biology I am suggesting is not by any means universally

received. It is quite radical and far from proven. Before a truly compelling argument for an expanded biology of the sort I have described can be offered, a great deal more work—both empirical and philosophical—will be required. The developments we have seen in clinical psychology and elsewhere, however, suggest an exciting direction that this work might take and offer the first intuitions of a new and more satisfying way of thinking about mind and body that is well worth pursuing.

NOTES

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1. Of course, as Freud and others make clear, one cannot make a diagnosis quite so simply. It may not be the case that this woman does not wish to be a doctor but rather that she fears failure or does not wish to move away from home. There are many ways in which her actions might be explained, and to choose among them and correctly attribute unconscious mental activity, it is necessary to know far more about her life than this simple sketch can provide. The basic idea behind these examples should, however, be fairly clear.

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