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WITTGENSTEIN AND NEUROSCIENCE

In the first half of this paper (Sections 1–5) I consider Wittgenstein's claim that science, and particularly neuroscience, is irrelevant to the resolution of philosophical problems, especially those in the philosophy of mind. I argue that this position is undermined by Wittgenstein's own views on criteria and the possibility of conceptual change. In the course of this discussion I try to account for Wittgenstein's apparent pessimism about the prospects for a successful neuroscience. I conclude that Wittgenstein's conservatism about the philosophical relevance of science, as well as his pessimism about the scientific prospects of neuroscience, are not well-founded.

In the second half of this paper (Sections 6–10) I address the question whether Wittgenstein has anything positive to contribute to our understanding of the relationship between neuroscience and the philosophy of mind. In particular, I examine the status of folk psychology and the prospects for its displacement by a scientific psychology founded on neurophysiological theory, as predicted by the eliminative materialists (or, as I shall call them, the San Diego imperialists). Wittgenstein suggests that there may be more to folk psychology than can be captured by neuroscience. If neuroscience were able to displace folk psychology, this would raise value questions about whether we want this to happen.

1.

The language of mental states – e.g., pains and beliefs, intentions and sensations – is an established part of our ordinary discourse, having a reasonably clear use and, thus, meaning. All of this is so quite apart from any acquaintance with neurological facts. We employed the language perfectly well before we knew anything at all about the brain.

Despite a long tradition of ascribing, describing, and discussing mental states, we find ourselves in some philosophical perplexities about them. For example, we wonder whether certain sensations of

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others are at all like our own, or whether they might not be quite different: Does he really feel more pain from a bee sting than I do, or does he just complain more? Does grass look green to her, the way it does to me, or does it look red to her, the way fire engines look to me? This is the traditional problem of the inverted spectrum – a problem that holds considerable interest for Wittgenstein.¹

Wittgenstein recommends approaching this perplexity by gaining a proper synoptic view of our language.² Philosophical perplexities arise from confusions about what we already know. Generally they arise from misuses of language urged on us by improper analogies or extensions. The resolution of a philosophical problem is like the realization that we were under a misapprehension: It disappears when we get a proper synopsis of what was already familiar. It does not depend on the discovery of any new facts.³

In the case of the inverted spectrum, Wittgenstein holds that the identity conditions for “looks” and “feels” of things allow for and depend on ordinary descriptive comparisons of those looks and feels. How another person behaves in certain circumstances – especially how the person sincerely describes a sensation – is a criterion for what sensation that person has. When looks of things are supposed to transcend all possible descriptions, we falsely imagine that something can still be compared. But, lacking identity conditions, there are no transdescriptive looks or feels of things.⁴ No discoveries about how things are in the brain could have any relevance to our use of mental language, or to the resolution of philosophical perplexities such as the inverted spectrum.⁵

The same should hold for the relationship between all types of science, on the one hand, and philosophical perplexities, on the other. Philosophy and science are on different levels. Let us call this Wittgenstein’s *insulation thesis*: Science is not relevant to the resolution of philosophical problems. This is a thesis Wittgenstein espoused throughout his philosophical career.⁶

2.

This insulation of philosophy from science seems to result from Wittgenstein’s view that the criteria for application of philosophically perplexing concepts lie within ordinary grasp. We only need to appreciate them properly through a synopsis of the relevant portion of

our language. Nothing that science discovers will affect the application of these concepts. Thus, to understand this insulation, we must understand Wittgenstein's view of criteria.

Criteria, according to Wittgenstein, justify the use of a term while, in some sense, serving to fix its meaning. Where there are criteria for a concept, there can also be symptoms – phenomena empirically correlated with criteria. Wittgenstein initially presents these notions through considering angina,⁷ by which he seems to have meant “influenza” or “flu” (rather than angina pectoris).

Here is a modernized and more elaborate discussion: People have long suffered on occasion from fever, muscular aches, and inflammation of the respiratory tract all at the same time. These things seemed to go together, and were known in combination as influenza. Because no one liked influenza and it could on occasion be fatal, people became concerned to learn how to prevent or cure it. With the advent of electron microscopy this led to medical research that discovered the underlying cause of the sufferings – a certain kind of viral infection. Unfortunately we still do not know how to cure such an infection, and it is only sometimes possible to prevent it. Once the underlying cause was identified, it became more convenient for “flu” to refer to the underlying condition that caused the suffering, rather than to the various forms of suffering themselves. In fact, it turned out that it was possible to suffer in one or more of these ways without its being due to the flu virus, and, through the development of certain drugs, such as analgesics and decongestants, to have the flu virus without suffering from it in these ways.

To introduce Wittgenstein's terminology, then, flu is a disease the criterion for which is the presence of a certain kind of viral infection. The disease also has certain symptoms, empirically correlated with the viral infection, which are introspectable or externally detectable bodily conditions. We ordinarily identify the disease by its symptoms, but these are only defeasible clues to the presence of the disease itself. They are common effects of (the body's attempt to fight) the viral infection.

We can also apply this terminology to mental states, though the application is complicated by the asymmetry between the first person and third person perspectives on mental states.⁸ When speaking of one's own pain one employs no criteria, whereas when speaking of another's, one employs the behavior, especially the words, of the other

as criteria. Desires are still more complicated since, though one generally employs no criteria in identifying one's desires, one can occasionally be led to revise one's avowal of a desire through attention to one's own behavior.⁹ As with pains, however, one ascribes desires to others on the basis of their behavior. Thus, to the extent that there are criteria for mental states, the criteria are behavioral: To have a certain belief, for example, is to behave in certain ways in certain circumstances.

It is natural to wonder whether there are symptoms of mental states. A symptom would, of course, be a phenomenon empirically correlated with the criteria. Insofar as neuroscience isolates brain states and correlates them with mental states identified by behavioral criteria or by first person avowal, brain states would serve as symptoms of mental states.¹⁰ The relationship of brain states to mental states is necessarily derivative from, and always answerable to, the original behavioral criteria. Thus, neuroscience may help us to understand the physical correlates of the mental, but it can do nothing to change our use of mental concepts or to resolve our philosophical perplexities about the mental.¹¹

3.

But the situation is not nearly this clear after all, as Wittgenstein makes immediately apparent in his introduction of the notions of criteria and symptoms: Which phenomena are criteria and which are symptoms is often somewhat indeterminate or a matter for discussion.¹² Wittgenstein admits this indeterminacy or fluctuation is common in science. And there is no reason to suppose that it is confined to science.

There is a potential ambiguity in what Wittgenstein is admitting that is worth distinguishing here. From what Wittgenstein says, it sounds as though changes of criteria are more or less immediately possible, so that we may choose which phenomena are to count as criteria. Let us call this the *Strong Thesis*. A *Weak Thesis*, implied by this, and also more plausible, is the view that criteria can shift over time. This occurs commonly under the pressure of scientific research, and is not so much a matter of choice as it is a change in thinking. This weak thesis seems undeniable after a glance at the history of science.¹³ It seems, for example, to be exactly what happened in the case of

influenza. The syndrome of sufferings was demoted from criteria to symptoms. Since the weak thesis is implied by the strong thesis, which Wittgenstein endorses, he is certainly committed to it.

If change in the criteria of concepts – conceptual change – is possible, and Wittgenstein admits that it is, then what is to prevent neuroscience from discovering enough about brain states that we should eventually see it as natural to treat brain states as criteria for mental states, and treat behavior as symptoms (paralleling the evolution of our concepts of diseases)? Identity theorists in the philosophy of mind predict that relatively precise correlations will be found, so that these shifts in criteria can occur. Alternatively, neuroscience might discover that brain states do not correlate well with (any of) the mental states we commonly ascribe. In that case ordinary talk of mental states such as pains or beliefs might come to have the status of talk of caloric fluid, phlogiston, and witches: Ordinary mental concepts would disappear. This is the prediction of the San Diego imperialists.¹⁴ If neuroscience does achieve a clear understanding of the brain, and if concepts can change or disappear, then there is no reason in principle why facts about the brain, as discovered by science, should not become quite relevant to our understanding of, and philosophical perplexities about, the mental.¹⁵ If brain states become criterial for mental states, as predicted by the identity theory, the problem of the inverted spectrum will be resolved by direct inspection of people's brains. If our ordinary notions of mental states are eliminated, as predicted by the San Diego imperialists, then the problem will disappear, because the concepts that gave rise to it will have disappeared (and any parallel problem regarding the new concepts can be resolved by direct inspection of people's brains).

4.

This line of argument against Wittgenstein's insulation of philosophy from science might be resisted in the following way. Since criteria serve to fix, at least in part, the meaning of the concept for which they are criteria, any change in criteria constitutes a change in the concept. So it does not make sense to speak of changing criteria for a given, say mental, concept. Changing the criteria changes the subject.¹⁶

But Wittgenstein clearly does not think that this is necessarily the case – changing the criteria does not always change the concept.¹⁷

And even if this were the case, it would not help the insulation thesis. If change of criteria automatically changes the concept, then it presumably eliminates the old concept, and thus identity theories turn out to be eliminative theories after all.

Connected with the previous line of resistance is another. If certain concepts give rise to a set of philosophical puzzles, then, according to Wittgenstein, a philosophical resolution of those puzzles is to be achieved by gaining a proper synopsis of that region of our language. We will come to realize we were under some grammatical misconception. If scientific research provokes conceptual change we may either jettison the concepts that gave rise to the puzzle, as the San Diego imperialists predict, or radically change the criteria of the concepts, as the identity theorists predict. In both cases we will be left with concepts that do not give rise to (those) philosophical puzzles. But in neither case can we be said to have provided a philosophical resolution of those puzzles. We have not resolved *those* puzzles, we have rejected or ignored them. You do not resolve a man's philosophical puzzles by shooting him or inducing amnesia. The only philosophical resolution of the puzzles is by Wittgenstein's method, to which science can lend no assistance in any form.

This line of resistance is interesting, but I think it ultimately fails. Let us accept the conditions for a philosophical resolution as they have been stated. Science cannot, either through discovery of facts or conceptual change, provide a *philosophical* resolution to these philosophical puzzles. It does not follow from this, however, that science cannot provide some other kind of resolution. Wittgenstein speaks of the resolution (or dissolution) of a philosophical puzzle as one in which: the puzzle "*completely* disappears"; it "releases the questioner from his problem"; and leads to the "vanishing of the problem".¹⁸ This is just what conceptual change produces.

Consider the archaic scientific question of the specific gravity of caloric fluid. It would have been no resolution of that problem to disembowel the scientists who were puzzled by it. Yet the resolution did not require the scientific discovery of caloric fluid's specific gravity. There was no such thing. We are comfortable saying that the problem was resolved through the rejection of the concept that gave rise to it. This was not a scientific solution of the problem (which would have required the discovery of the specific gravity), but a conceptual resolution provoked by science. Let us distinguish, then,

between a *scientific resolution* of a scientific problem, and a *conceptual resolution* of that problem that is provoked by science.

Wittgenstein is well aware of the importance of conceptual resolutions of problems. In 1946 he wrote:

Getting hold of the difficulty *deep down* is what is hard.

Because if it is grasped near the surface it simply remains the difficulty it was. It has to be pulled out by the roots; and that involves our beginning to think about these things in a new way. The change is as decisive as, for example, that from the alchemical to the chemical way of thinking. The new way of thinking is what is so hard to establish.

Once the new way of thinking has been established, the old problems vanish; indeed they become hard to recapture. For they go with our way of expressing ourselves and, if we clothe ourselves in a new form of expression, the old problems are discarded along with the old garment.¹⁹

Wittgenstein is here endorsing the weak thesis about conceptual change, and acknowledging it as a source for the conceptual resolution of problems.

There seem, on analogy, to be three conceivable ways of resolving a philosophical problem: A *philosophical resolution* of a philosophical problem would be a resolution brought about by a proper synoptic view of the language. A *scientific resolution* of a philosophical problem would be a resolution brought about by the discovery of new facts. A *conceptual resolution* of a philosophical problem would be a resolution brought about by a change in the criteria of concepts or the replacement of concepts.

In propounding the insulation thesis Wittgenstein seems mainly to be opposing the possibility of scientific resolutions of philosophical problems. We can, perhaps, agree with him in this opposition.²⁰ Yet that would not establish the insulation thesis in its full generality. Science not only discovers new facts, but in doing so, as the weak thesis acknowledges, it can affect old concepts. Science can be relevant to the resolution of philosophical perplexities by provoking a conceptual resolution of them.²¹

The conceptual source of philosophical perplexity was quite apparent to Wittgenstein. In 1931 he wrote:

People say again and again that philosophy doesn't really progress, that we are still occupied with the same philosophical problems as were the Greeks. But the people who say this don't understand why it has to be so. It is because our language has remained the same and keeps seducing us into asking the same questions. As long as there continues to be a verb 'to be' that looks as if it functions in the same way as 'to eat' and

'to drink', as long as we still have the adjectives 'identical', 'true', 'false', 'possible', as long as we continue to talk of a river of time, of an expanse of space, etc. etc., people will keep stumbling over the same puzzling difficulties and find themselves staring at something which no explanation seems capable of clearing up.²²

One might suppose that Wittgenstein's pessimism here stemmed from the fact that he had not yet become convinced of the effectiveness of his own philosophical techniques. But even sixteen years later, in 1947, Wittgenstein was unsure that his own philosophical techniques were the best (and, a fortiori, the only) way of dealing with philosophical perplexities:

I am by no means sure that I should prefer a continuation of my work by others to a change in the way people live which would make all these questions superfluous

A philosopher says "look at things like this!" – but in the first place that doesn't ensure that people will look at things like that, and in the second place his admonition may come altogether too late; it's possible, moreover, that such an admonition can achieve nothing in any case and that the impetus for such a change in the way things are perceived has to originate somewhere else entirely.²³

Thus, Wittgenstein clearly recognizes the possibility and even the need for conceptual resolutions of philosophical problems. The only step left toward the complete rejection of the insulation thesis is an admission that science can lead to a change in concepts that give rise to philosophical perplexity.

5.

It is not clear that Wittgenstein was willing to take this last step with respect to neuroscience and philosophical perplexities about the mental. In the late 1940s he wrote:

No supposition seems to me more natural than that there is no process in the brain correlated with associating or with thinking; so that it would be impossible to read off thought processes from brain processes. I mean this: if I talk or write there is, I assume, a system of impulses going out from my brain and correlated with my spoken or written thoughts. But why should the *system* continue further in the direction of the centre? Why should this order not proceed, so to speak, out of chaos. The case would be like the following – certain kinds of plants multiply by seed, so that a seed always produces a plant of the same kind as that from which it was produced – but *nothing* in the seed corresponds to the plant which comes from it; so that it is impossible to infer the properties or structure of the plant from those of the seed that it comes out of – this can only be done from the *history* of the seed. So an organism might come into being out of something quite amorphous, as it were causelessly; and there is no reason why this should not really hold for our thoughts, and hence for our talking and writing.

It is thus perfectly possible that certain psychological phenomena *cannot* be investigated physiologically, because physiologically nothing corresponds to them.²⁴

In other terminology we might say that Wittgenstein countenances the possibility of, indeed, seems to expect, ungrounded counterfactuals: Different counterfactuals may be true of two people without being true in virtue of any contemporary internal categorical fact about the people. The people may be neurophysiologically indistinguishable – both in a state of chaos.²⁵ We are inclined to find this extremely implausible. As Wittgenstein recognizes, it threatens to upset our whole notion of causality.²⁶

Wittgenstein never did unsuccessful research in neuroscience. Whence the a priori pessimism?²⁷ Colin McGinn has accused Wittgenstein of making a fallacious, though understandable, inference. Since our mental discourse in no way makes appeal to neurological regularities, our discourse could proceed as it does even if there were chaos in the brain. For all we know about mental discourse, it is epistemically possible that there be chaos in the brain. (This much seems correct.) But, McGinn suggests, Wittgenstein goes on to infer the metaphysical possibility that there could really be chaos in the brain. This inference is fallacious in that we have come to doubt that metaphysical possibilities can be inferred from epistemic ones.²⁸

Yet McGinn's explanation seems inadequate. Wittgenstein does not assert the mere possibility of chaos in the brain. He asserts its likelihood: "No supposition seems more natural" and "nothing seems more possible".²⁹ The fallacious inference will not explain these more ambitious claims.

Lacking a better explanation, I can only conjecture that Wittgenstein backed into pessimism about the scientific prospects for successful neuroscience through the need to preserve the consistency of his other philosophical views. Only if neuroscience can understand the brain is there a danger that neuroscientific research might lead to conceptual change that would resolve certain philosophical perplexities about the mind. Perhaps Wittgenstein was unwilling to take the last remaining step toward the rejection of the insulation thesis.³⁰

6.

If we reject Wittgenstein's questionable pessimism about the scientific prospects for neuroscience, we must face the issue of what the

philosophical importance of neuroscience is. It turns out that Wittgenstein has interesting insights on this issue. (Thus, he apparently did not entirely trust his own avowed pessimism.)

San Diego imperialists think of the mental and its associated folk psychological concepts as just so many primitive scientific concepts – concepts designed to explain, predict, and control human behavior. They conjecture that these concepts, such as belief, desire, will, and self, will go the way of such other primitive scientific concepts as caloric fluid, phlogiston, witch, and impulse. They will die, from uselessness or harmfulness, while being replaced by concepts from a more successful scientific psychological theory.³¹

If we are willing to see folk psychology simply as a primitive attempt at science, and neuroscience as a sophisticated approach to achieving the same ends, then folk psychology's fate would seem to be sealed.³² But perhaps we should ask, instead, whether all the concepts of folk psychology have an untainted role as science, that can be modified or replaced by sophisticated science. Do scientific purposes exhaust the purposes of folk psychology?

In 1947 or 1948 Wittgenstein wrote the following:

Psychological concepts are just everyday concepts. They are not concepts newly fashioned by science for its own purposes, as are the concepts of physics and chemistry. Psychological concepts are related to those of the exact sciences as the concepts of the science of medicine are to those of old women who spend their time nursing the sick.³³

(I assume Wittgenstein accidentally got the analogy in the last sentence backwards. Psychological concepts are supposed to be like the concepts of the old women.) Insight into this obscure passage is provided by Oets Bouwsma, in his recently published record of conversations with Wittgenstein. In 1949, according to Bouwsma, Wittgenstein:

talked about having spent two weeks as a nurse at the bedside of a nephew injured in a motorcycle accident. He and an old German servant woman took turns. This was in Roermond, Holland. These were the finest nurses he had ever met. Catholic nurses, sleepless for days, yet diligent and cheerful. This...struck him.... They've got something.³⁴

What are we to make of this?

Let us begin with the case of medicine. Recall the discussion of flu. The concept of influenza begins as a syndrome of sufferings. As medicine advances, it becomes the name of an underlying condition.³⁵

Insofar as our purposes are to predict the course of suffering, prevent the suffering from spreading to others, and cure the suffering, this change in criteria is a valuable one. Since these were largely our purposes, this conceptual change occurred.

But these are not our only purposes, for we are sometimes concerned simply to comfort the suffering, and this is not a purpose that is advanced by focussing on the underlying condition.³⁶ Indeed, focussing on the underlying condition abstracts from the suffering altogether, seeing it as a peripheral symptom. Wittgenstein was concerned about just this tendency in medicine. In 1948 he told Drury, a former student who was working as a doctor:

Always take a chair and sit down by the patient's bedside: don't stand at the end of the bed in a dictatorial attitude. Let your patients feel they have time to talk to you.³⁷

And Rush Rhees comments on this advice by relating that:

Wittgenstein may have been half remembering his own experience as a patient in Guy's Hospital after an operation for removal of the gall-bladder, in 1942. He spoke to me especially of the unimaginativeness of one young doctor who would 'make the rounds' of the ward in the morning: 'He would come and stand by my bed, and talk to me – a somewhat elderly professor – in a way in which *I* would never talk to a *schoolboy*: "Well: how are you?" As Wittgenstein imitated the voice, it might have been a quarter-master-sargeant.³⁸

The importance of comforting the sick and injured is, or should be, a prominent issue in the philosophy of medicine. At one time offering comfort was part of the tradition of doctors. Bedside manner had real importance. But now so much is known about prevention and cure that relatively little attention is given to comfort. This shift in attention is reasonable in many respects, though it has doubtless gone too far, since many illnesses and injuries still have no, or no immediate, cure, and require primarily comfort.

To the extent that traditional concepts of health care embody a concern for comfort and suffering, their whole purpose will not be assumed by the concepts of scientific medicine. If they are replaced by the concepts of scientific medicine nevertheless, something valuable may be lost.³⁹ Scientific purposes of prediction and control are not the only respectable purposes, yet they tend towards a hegemony that should be resisted. In 1947 Wittgenstein wrote:

Science: enrichment and impoverishment. *One* particular method elbows all the others aside. They all seem paltry by comparison, preliminary stages at best.⁴⁰

When we consider concepts of primitive physics or chemistry it is fairly clear that these are attempts at science and nothing more. Thus, it is perfectly appropriate that they should wither in the face of modern science. Wittgenstein himself makes this point. But are the purposes of folk psychology exhausted by the purposes of science – namely, explanation, prediction, and control? San Diego imperialists suppose that they are. Paul Churchland appeals to the “inductive lesson from our conceptual past”: “the vast majority of our past folk conceptions have been . . . exploded. All except folk psychology, which survives to this day, and has only recently begun to feel pressure”.⁴¹ But the induction will be educational only if folk psychology is analogous to primitive sciences. Wittgenstein seems to be suggesting that it is not. There is something more to folk psychology than will be found in exact science, just as there is something more to caring for the sick than can be found in the science of medicine.

7.

What is that “something more”? Certain concepts of folk psychology might be necessary for rational agency in the world. For the sake of illustration, let us focus on the concept of the self, or I. The claim that the concept of the self is a necessary condition for agency could be made in two ways by Wittgenstein.

First, there is the Kantian approach found in his earliest work, through the influence of Schopenhauer. In the first week of August, 1916, Wittgenstein recorded the following thoughts:

Good and evil only enter [the world] through the *subject*. And subject is not part of the world, but a boundary of the world. It would be possible to say (à la Schopenhauer): It is not the world of Idea that is good or evil; but the willing subject . . .

The thinking subject is surely mere illusion. But the willing subject exists. If the will did not exist, neither would there be that centre of the world, which I call the I, and which is the bearer of ethics.⁴²

We can construct an argument for Wittgenstein along the following lines. Agency requires the ability to evaluate actual and possible behavior, deliberate about how to behave, make decisions, and form intentions. These are all functions of folk psychology. They are practical functions that accompany its admittedly scientific functions

of explanation and prediction.⁴³ And they are, according to Wittgenstein, dependent on a concept of the willing self. But, as Wittgenstein also sees, the willing self is not part of the world and, hence, there is no reason to suppose it will be countenanced by neuroscience. Neuroscience may come to understand us completely as objects, without being able to understand us as subjects or agents. The point is not that neuroscience may not be able to explain how we act. The point is that it cannot encompass the parts of our conceptual scheme necessary for our being deliberative and evaluative agents. Yet these parts of our conceptual scheme are parts of folk psychology.⁴⁴

The mature Wittgenstein would have defended the same conclusion, I am convinced, but in a rather different way. The defense would have involved showing the pervasiveness of the concept of the self or I in a network of practical language games that would likely collapse without it. I will not attempt this now.

8.

If, as Wittgenstein seems to suppose, neuroscience is fated to be incomplete with respect to our current purposes and self-conceptions (which have been with us since sometime after the era of the Homeric Greeks⁴⁵), there are two possibilities for our conceptual future: These practical purposes of folk psychology and aspects of ourselves will live on, immune to the progress of science; or they will wither – not because they will be replaced by sophisticated scientific concepts that have the same purpose, but because they will find no place in scientific purposes and so be choked by excessive scientism. Call the latter case *incompatibilism*.

This latter possibility we find fearful: Science threatens to dehumanize us by getting us to forget, and thus excising, our nature as agents in the world. In this light one can perhaps begin to understand Wittgenstein's pessimistic remark of 1947:

It isn't absurd, e.g., to believe that the age of science and technology is the beginning of the end for humanity; that the idea of great progress is a delusion, along with the idea that the truth will ultimately be known: that there is nothing good or desirable about scientific knowledge and that mankind, in seeking it, is falling into a trap. It is by no means obvious that this is not how things are.⁴⁶

The consequence for agency is drawn by Dennett: “We, *as persons*, cannot *adopt* exclusive mechanism (by eliminating the intentional stance altogether)”. To quote Stich’s characterization of Dennett’s view: “To do this is to plunge into the abyss, since the concept of personhood stands at the very center of our conception of ourselves and our place in the universe”.⁴⁷

Of course, as Lucretius would have argued, this seems fearful to us now only because of the practical purposes we now have, and once we lose those purposes there will be nothing fearful in their absence. While this may be true, it is certainly no consolation. It only adds, now, a fear of the loss of concern for our practical purposes to the fear of the loss of the practical purposes themselves. We will still be left with a reason, now, to fear the hegemony of neuroscience.

The enormity of the changes likely to follow from a mature neuroscientific understanding is not denied by the San Diego imperialists – indeed, it is savored. The neuroscientific revolution is compared, by Stich and by Patricia Churchland, to the Copernican and Darwinian revolutions – freeing us from the primitive superstitions of the past, and setting us on a journey of high intellectual adventure.⁴⁸

Set in this way, the comparison makes Wittgenstein and any allies look like reactionary fools. But, in fact, Wittgenstein, and his allies, have a high regard for the ideas of Copernicus and Darwin.⁴⁹ The problem lies with the alleged analogy. Though these other revolutions radically changed our conception of our place in the universe, they did not obviously threaten our self-conception as rational agents. It is this self-conception that one might hold to be crucial, and endangered.

What must lie behind the optimism of the San Diego imperialists is a belief that increased knowledge is inevitably a good thing. This is a value judgment that merits careful examination. What is striking is that it receives none.⁵⁰ Do we all believe that we should follow science wherever it leads, even granted that that has always proven beneficial in the past? The imperialists tell of the glorious achievements that might result, in ways that distract our attention from the great uncertainty involved. But the uncertainty remains, even in the glorious descriptions: for example, “We may be poised to begin a similar adventure”, “discovered facts of brain function might be no bad thing”, “it is at least conceivable that” our current ideas will come to seem backward, and so on.⁵¹

When so much is at stake, is the best strategy to forge ahead? Those

who believe in progress will think so. But Wittgenstein did not believe in progress:

It is all one to me whether or not the typical western scientist understands or appreciates my work, since he will not in any case understand the spirit in which I write. Our civilization is characterized by the word 'progress'. Progress in its form rather than making progress being one of its features. Typically it constructs . . . I am not interested in constructing . . . So I am not aiming at the same target as the scientists and my way of thinking is different from theirs.⁵²

Of course, we might well think that Wittgenstein goes too far in the direction of pessimism.

As I see it, the key problems are whether the possession of knowledge can itself be harmful (apart from dangers of its abuse), and, if so, how best to manage the risk of that harm. Can the mere possession of knowledge be harmful? Here are some examples of how it can: A seriously ill man may be better off not knowing his chance of dying. The knowledge might kill him. Knowledge of evil in the world may lead to the loss of someone's innocence. That is not obviously good. Christopher Cherniak tells a story in which learning a certain, apparently Gödelian, truth, causes one to lapse into a coma.⁵² That would not be good either. These kinds of cases suggest how in seeking certain kinds of knowledge one may be "falling into a trap".

Similarly, if folk psychological concepts and purposes would wither because of the advance of neuroscientific knowledge, this raises the value question of how best to manage the risk of that harm.⁵⁴

Suppose we take a consequentialist approach to this problem. A simplistic evaluation would compare the expected long-term consequences of the pursuit of neuroscience with the consequences of not pursuing neuroscience.⁵⁵ By examining the status quo we know basically what are the consequences of not pursuing neuroscientific research further (barring the appearance of unforeseen "needs" for neuroscientific knowledge). Currently the main foreseeable applications of neuroscience are in the treatment of mental and emotional defects.⁵⁶ These applications affect relatively few people, though the effect is undoubtedly significant for them. Against this has to be weighed the potential threat to rational agency of all people (as well as the dangers of abuse).

How are these to be compared with one another? Typically consequentialists would employ the measures of happiness or desire-

satisfaction. But there is a problem with employing these measures, since they involve the concepts of folk psychology. Our means for comparing policies are themselves called into question by one of the policies. Presumably happiness and desire-satisfaction will themselves be displaced by other concepts more neurophysically hygienic.⁵⁷

Whether one employs current measures, however, or advanced neuroscientific ones, it is not obvious that humankind will be better-off by pursuing neuroscience. If incompatibilism is true, do people want science to continue a policy that, by the imperialists' own admission, threatens rational agency? To put the issue in Wittgensteinian terms: Which form of life do we want to live in? There is no a priori reason to suppose that all conceptual changes induced by the advance of science will be beneficial. The proper attitude toward such changes is not itself a matter to be resolved through future research.

9.

There was another possibility besides incompatibilism. Perhaps the concepts and purposes of folk psychology will live on in spite of, and in co-existence with, neuroscientific progress. Call this *compatibilism*. This might happen in one of two ways:

The conceptual influence of neuroscientific advances might be limited to the scientific practice of neuroscience, and not find its way into ordinary language. This sort of compatibilism seems to hold for the relationship between contemporary physics and ordinary thinking with respect to the concepts of solidity, space and time. These ordinary concepts seem to have no place in contemporary physics. In the case of medicine one might say that the purpose of comfort has been delegated to the nurses, while the doctors have focussed on cure.⁵⁸

Or instead it might happen that neuroscientific progress influences ordinary thinking, not by supplanting folk psychology, but by supplementing it. If folk psychology has practical as well as predictive and explanatory purposes, then folk psychological concepts may be transformed into neuroscientific concepts for the predictive and explanatory purposes, but remain unaffected for deliberative purposes. Folk and neuroscientific concepts would exist in each person, for different purposes – rather like bilingualism.⁵⁹

This raises the problem of the extent to which practical and predictive purposes can be disentangled. Each of us is both agent and investigator of others. Are these two different jobs? Probably not, since investigation itself involves agency and agency must be informed by investigation. The purposes seem to be too intertwined.⁶⁰ If the practical purposes of folk psychology are tied up with a primitive and defective science of behavior, the practical purposes may themselves be infected by this defect and deserving of displacement. One might, for example, hold that all the various functions of religious language are undermined by the failure of religion as a scientific enterprise: The Genesis story of creation is false, so all religious concepts tied to the Genesis story are defective. But we should be skeptical of this kind of guilt by association. The practice of religion has not by any means died out under the influence of science, even among respected scientists. Christians, for example, have reacted in various ways to the encroachment of science – some resisting, others accommodating it.

10.

How can we determine whether compatibilism or incompatibilism will hold for the relationship between folk psychology and neuroscience? One might think that the Kantian transcendental argument shows that folk psychology could not be displaced. But that would be mistaken. All that argument shows is the cost of such a displacement: To displace folk psychology is to risk losing our self-conception as rational agents. Nothing could prove that members of the species *homo sapiens* must be, or think of themselves as, rational agents.⁶¹

Whether compatibilism or incompatibilism will be borne out is not a philosophical but a sociological question. For Wittgenstein this is a question of the evolution of and relationships between language games. Entailment and exclusionary relationships do not hold between language games. The history of the relationship between science and religion confirms this. But, on the other hand, logical compatibility between language games need not prevent the hegemony of one.

11.

Wittgenstein's attitude towards neuroscience is complex and not easy to assess. His remarks on neuroscience are scattered and rarely more

than suggestive. Yet they are so striking as to demand investigation. I have tried to elaborate these remarks into views so that they can be assessed. In so doing I have had to go well beyond his actual remarks, but this has led us through important philosophical territory.

To conclude: Wittgenstein is reluctant to admit the philosophical relevance of neuroscience. But there are strands in his thought that should undermine this reluctance. He develops some of these strands in spite of himself.

Wittgenstein plausibly claims that the purposes of folk psychology go well beyond those of any neuroscientific psychology. If incompatibilism is true, neuroscientific progress may lead to profound changes in human nature. Wittgenstein warns against these. So do I. If compatibilism is true, then the San Diego imperialists are making much ado about nothing much.⁶²

NOTES

¹ See, for example, Ludwig Wittgenstein: 1958, *The Blue and Brown Books* (hereafter: *BB*), pp. 60–61; ‘Notes for Lectures on “Private Experience” and “Sense Data”’ (*NFL*), *Philosophical Review*, 1968, pp. 275, 283–84; *Philosophical Investigations* (*PI*), 3rd ed., 1968, Sections 272–79; and *Zettel* (*Z*), 1967, Sections 536, 553.

² “Synoptic view” is a translation of Wittgenstein’s term *Übersicht*. The term is notoriously difficult to translate. For a full discussion of Wittgenstein’s use of the concept, see Baker and Hacker: 1980, *Wittgenstein: Understanding and Meaning*, pp. 531–45. I have used the phrases “synoptic view” and “synopsis” because they were apparently used by Wittgenstein in his lectures. See, for example, G. E. Moore: 1959, ‘Wittgenstein’s Lectures in 1930–33’ (*WL*), in *Philosophical Papers*, p. 256.

³ See, especially, *PI*, Sections 89, 109, 122. Some examples of sources of philosophical confusion are given in *Z*, Section 113 and *BB*, pp. 7, 28.

⁴ Key elements of Wittgenstein’s resolution of the problem of the inverted spectrum are given in *Z*, Sections 433–35 and *NFL*, p. 317. Some related insights are found in *PI*, Sections 290, 374, 377, 610.

⁵ See, for example, Wittgenstein’s *Last Writings on the Philosophy of Psychology*, Vol. I (*LW*), 1982, Section 77; *PI*, Sections 370, 376, and pp. 203, 212; and *Lectures and Conversations on Aesthetics, Psychology and Religious Belief* (*L&C*), 1967, p. 20. For a philosopher who proposes that the problem of the inverted spectrum can be solved by investigation of neurophysical facts, see Sidney Shoemaker: 1982, ‘The Inverted Spectrum’, *Journal of Philosophy*, pp. 373, 378.

⁶ The thesis that philosophy is “over or under, but not beside, the natural sciences” makes its appearance in Wittgenstein’s earliest work, ‘Notes on Logic’, written in September, 1913, and published in *Notebooks: 1914–1916* (*NB*), 2nd ed., 1979, p. 106. It surfaces in *Tractatus Logico-Philosophicus*, 2nd ed., 1961, 4.111; and *PI*, Sections 109, 122–33.

⁷ See *BB*, pp. 24–25. It is worth keeping in mind that while the criteria for application of “angina” or “flu” do not lie within ordinary grasp, neither are they philosophically perplexing concepts.

⁸ The phrase “mental states” is not a happy one for discussions of Wittgenstein, but I can think of no better term to cover the phenomena of pain, sensation, belief, desire, intention, and so forth. A good discussion of the problem can be found in Colin McGinn: 1984, *Wittgenstein on Meaning: Interpretation and Evaluation*, pp. 102–108.

⁹ It is this kind of corrigibility in first person ascriptions of what we call “propositional attitudes” that makes psychoanalysis possible. Cf. *PI*, pp. 191–92. We can understand the notion of unconscious propositional attitudes in a way that we cannot understand the notion of unconscious pain.

¹⁰ Brain states are treated as symptoms of mental states by Malcolm in ‘Wittgenstein’s *Philosophical Investigations*’, *Philosophical Review*, 1954, p. 544. See *BB*, pp. 7–8, but cf. also *Z*, Section 526. Certain mental states might have other kinds of symptoms as well. Anger could be a symptom of the belief that one’s spouse was unfaithful.

¹¹ McGinn has argued that the relationship of brain states to the mental is necessarily derivative in *Wittgenstein on Meaning*, pp. 115–16.

¹² See *BB*, p. 25; *PI*, Sections 79, 354; and *Z*, Section 438.

¹³ A glance at the history of art and literature would establish the same thing. Twentieth Century expressionist painting would not have been considered painting from earlier perspectives. What counts as a novel has undergone transformation through the work of James Joyce, Virginia Woolf, and others.

¹⁴ Charter members of the San Diego imperialists are Paul and Patricia Churchland and Stephen Stich, in philosophy, and Francis Crick, in neuroscience. Honorary members, who have not yet reached San Diego, are Paul Feyerabend and Richard Rorty. There are doubtless other sympathizers. This group used to be known as eliminative materialists.

¹⁵ Contra McGinn’s defense of Wittgenstein on this point in *Wittgenstein on Meaning*, pp. 115–16. Some philosophical stories that try to evoke this conception of the role of science in philosophy are Hilary Putnam’s ‘Brains and Behavior’, in *Language, Mind, and Reality: Philosophical Papers* Vol. 2, 1975; and Raymond Smullyan’s ‘An Epistemological Nightmare’, in D. Hofstadter and D. Dennett (eds.), *The Mind’s I*, 1981.

¹⁶ Cf. Donald Davidson: 1980, ‘Mental Events’, in *Essays on Actions and Events*, p. 216.

¹⁷ Wittgenstein’s discussion in *BB*, p. 25 makes it clear that he thinks changes in criteria are consistent with preservation of the same concept pretty much intact, because the identity conditions of concepts are generally fairly loose. On the other hand Wittgenstein does sometimes warn of significant changes in concepts due to changes in criteria (*Z*, Section 438). An interesting case to consider is Wittgenstein’s attitude towards the concept of “philosophy”, and the differences between philosophy as he practiced it and as philosophers before him practiced it. For some of his remarks on this case, see Moore’s *WL*, pp. 322–23.

¹⁸ See *PI*, Section 133; *Philosophical Grammar*, 1974, p. 193; and *T* 6.521, for the quoted phrases. See also *Culture and Value* (*C&V*), 1980, p. 43 (passage written in 1944).

¹⁹ *C&V*, p. 48.

²⁰ We can agree unless concepts whose criteria of application lie beyond ordinary grasp can be philosophically perplexing. If there are such concepts, then perhaps the philosophical perplexity they give rise to can be resolved scientifically. In this connection, see the puzzling remark in *LW*, Section 807, that scientific progress can be useful to philosophy.

²¹ Wittgenstein directly discusses this issue, but only in terms of the strong thesis about conceptual change. At *PI*, p. 212 he writes:

Imagine a physiological explanation of the experience You have now introduced a new, a physiological, criterion for seeing. And this can screen the old problem from view, but cannot solve it. – The purpose of this paragraph however, was to bring before our view what happens when a physiological explanation is offered. The psychological concept hangs out of reach of this explanation.

In this passage Wittgenstein is ostensibly discussing a case of conceptual change through change of criteria. But this only shows the implausibility of the strong thesis concerning conceptual change. Conceptual change in this strong sense is nothing more than conceptual legislative addition. The old psychological concepts that gave rise to the philosophical puzzles remain entrenched in our thinking, even if their linguistic labels get used in a new way. It is not surprising that conceptual legislation will not resolve philosophical puzzles. All this passage really denies is the possibility of scientific solutions of philosophical puzzles.

²² *C&V*, p. 15.

²³ *C&V*, p. 61. See, also, *Remarks on the Foundations of Mathematics*, revised edition, 1978, p. 132, Section 23.

²⁴ This remarkable passage apparently took form in manuscripts composed in 1946–1947. A typescript version was then prepared and later published as *Remarks on the Philosophy of Psychology*, Vol. I, (*RPP*) 1980. The quoted passage constitutes Sections 903–04. That this passage was no simple passing fancy is shown by Wittgenstein's preservation of it among selected cuttings from that typescript that were eventually published as *Zettel*. The quoted passage constitutes Sections 608–09. See also the continuation of this passage (*RPP*, Sections 905–06, 908–09 = *Z*, Sections 610–13). Similar sentiments are expressed in *L&C*, p. 20 at line 15, and *LW*, Section 504 (written during 1948–1949):

Indeed, I confess, nothing seems more possible to me than that people some day will come to the definite opinion that there is no copy in either the physiological or the nervous systems which corresponds to a *particular* thought, or a *particular* idea, or memory.

For doubts about the prospects of scientific success generally, see *C&V*, p. 40 (passage written in 1941).

One might think that in these passages Wittgenstein is only rejecting the possibility of understanding the brain in relation to the *current* concepts of psychology: In relation to them the brain is chaos. This would reinforce the imperialists' view that we must give up current concepts in favor of advanced scientific-psychological concepts that do not connect up with brain activity. This view has some plausibility to it, but not as a reading of the whole passage. Wittgenstein's position seems to be much more radical: The

analogy with the seeds suggests that he thinks the brain will ultimately embody nothing that explains behavior. Behavioral differences may be ungrounded in brain activity. One can believe the otherwise more plausible interpretation of this passage only by ignoring the remarks about seeds.

²⁵ Hilary Putnam also seems to countenance ungrounded counterfactuals in 'There Is At Least One A Priori Truth', in *Realism and Reason: Philosophical Papers* Vol. 3, 1983, pp. 108–09. It is worth remembering that while Wittgenstein denies that these counterfactuals supervene on contemporary facts, he does not deny, indeed, he seems to suppose, that they supervene on contemporary plus historical facts. If this were so, it would make behaviorism, with its "black boxes", a more appropriate methodology for the study of behavior than neuroscience.

²⁶ See, especially, *RPP*, Section 905 (= *Z*, Section 610). See also Wittgenstein's 'Cause and Effect: Intuitive Awareness' (*C&E*), *Philosophia*, 1976, pp. 410–11, 433–34; and *L&C*, pp. 13–15. Wittgenstein's willingness to challenge (what seems to be) our ordinary notion of causality in these passages is surprising, given his usual philosophical attitude, and is in need of further exploration, given its apparent perversity. If Wittgenstein were only making the more conservative claim considered in note 24 (that brain states will not connect up with folk psychology), then he would have no reason to go on to draw skeptical consequences for our concept of causality.

²⁷ Wittgenstein's attitudes toward science are not a product of mere ignorance. He was familiar with the physical theories of Hertz, Boltzmann and Einstein. His plan to study under Boltzmann was thwarted by the latter's suicide in 1906. Instead he trained as an engineer, doing original work in aeronautics. He did experimental work on the psychology of rhythm in music. And he did useful work in medicine and the physiology of shock during World War II.

²⁸ *Wittgenstein on Meaning*, pp. 114–15. Some support for McGinn's interpretation might be found in *RPP*, Section 1063. The pitfalls of inferring metaphysical possibilities from epistemic ones were warned against by Saul Kripke, *Naming and Necessity*, 1980, esp. Lecture III.

²⁹ *RPP*, Section 903 (= *Z*, Section 608) and *LW*, Section 504, respectively. Is Wittgenstein claiming these likelihoods, or even possibilities, for seeds as well as brains? McGinn has claimed that he is (*Wittgenstein on Meaning*, footnote 28 on pp. 113–14). But I am not so sure. In the passage from *RPP* Wittgenstein seems to present the seed case to *illustrate* or *explain* what he means by his claim about brains, not to instance a parallel case. Similarly, in *C&E* he seems to be using seeds to illustrate a point about causality, not to instance it. If I am right, then Wittgenstein seems to be making a special claim about the brain.

³⁰ I do not mean to impute intellectual dishonesty to Wittgenstein. His "moves" may have been quite unconsciously motivated. Though I am not satisfied with my conjecture, I know of no better one. I have been helped, in thinking about Wittgenstein's attitudes toward science, by reading Peter John's unpublished work in intellectual history on the importance of wonder as a value motivating Wittgenstein.

³¹ See, for example, Paul Churchland: 1984, *Matter and Consciousness: A Contemporary Introduction to the Philosophy of Mind*, pp. 43–47. Cf. also *PI*, Section 577.

³² For a different view, however, see T. Horgan and J. Woodward: 1985, 'Folk Psychology Is Here To Stay', *Philosophical Review*, who argue that folk psychology can

successfully compete with neuroscience on its own terms as a science of human behavior. The concession I make in the text is made only for the sake of focussing attention on what I take to be a more important issue.

³³ Wittgenstein, *Remarks on the Philosophy of Psychology* Vol. II, 1980, Section 62. See also *PI*, p. 232. For an elaboration of a Wittgensteinian argument that psychology cannot be scientific, see Meredith Williams: 1985, 'Wittgenstein's Rejection of Scientific Psychology', *Journal for the Theory of Social Behavior*.

³⁴ O. K. Bouwsma: 1985, *Wittgenstein: Conversations, 1949–1951*, p. 48.

³⁵ The history of the concept of "influenza" illustrates how an identity theory in the philosophy of medicine operates. In other cases, such as "consumption", the disease goes out of existence – not because it was finally eliminated through cure, as smallpox almost has been, but because the concept happens to conflate a variety of underlying conditions (such as tuberculosis, pneumonia, pleurisy, and lung cancer) usefully grouped together for the purposes of comfort, but not for the purposes of diagnosis, prognosis, or treatment. The history of the concept of 'consumption' illustrates how an eliminative theory operates.

³⁶ Some other purposes of our ordinary concepts of disease include excusing oneself and implying the presence of hidden symptoms in addition to obvious ones.

³⁷ M. Drury: 1984, 'Conversations With Wittgenstein', in R. Rhees (ed.), *Recollections of Wittgenstein*, revised edition, p. 154.

³⁸ R. Rhees, 'Notes', in *Recollections of Wittgenstein*, p. 223.

³⁹ Stanley Reiser (in *Medicine and the Reign of Technology*, 1978) has traced the history of the influence of technological and scientific medicine on patient care. He warns against many aspects of this trend. For a view of medicine that is sensitive to the kinds of concerns I have been airing, see the essays by Stanley Hauerwas collected in his book *Suffering Presence: Theological Reflections on Medicine, the Mentally Handicapped, and the Church*, 1986.

⁴⁰ *C&V*, p. 60. It is helpful to read Wittgenstein's 'Remarks on Frazer's *Golden Bough*' (in C. Luckhardt (ed.), *Wittgenstein: Sources and Perspectives*, 1979) in this light. Magic and ritual are not, or not only, primitive attempts at predicting and controlling nature. They also serve other purposes. Wittgenstein's main criticism of Frazer is that he does not comprehend these purposes.

⁴¹ Paul Churchland, *Matter & Consciousness*, p. 46.

⁴² *NB* entries for 2.8.16 and 5.8.16. Kant's transcendental influence has been recognized in other aspects of Wittgenstein's work as well.

⁴³ That the functions of folk psychology go beyond the functions of a science is a point that has been made in at least four recent discussions: Daniel Dennett: 1978, 'Mechanism and Responsibility', *Brainstorms*; Horgan and Woodward: 1985, 'Folk Psychology Is Here To Stay', p. 197; J. Kim: 1985, 'Psycho-physical Laws', in E. Lapore and B. McLaughlin (eds.), *Actions and Events: Perspectives on the Philosophy of Donald Davidson*, p. 386; and K. Wilkes: 1981, 'Functionalism, Psychology and the Philosophy of Mind', *Philosophical Topics*, pp. 149–50:

The conceptual apparatus of common-sense psychology stands to that of scientific psychology as a multi-purpose tool stands to a spanner.

Wittgenstein could have said that.

This same point is made in a rather different way by Wilfrid Sellars: 1963, 'Philosophy and the Scientific Image of Man', in *Science, Perception and Reality*, Section VII. He claims that the conceptual framework of persons that is embedded in the manifest image of man must be *joined* to the scientific image of man to preserve the notion of living one's life.

⁴⁴ A similar argument could be constructed for other central folk psychological concepts such as belief and desire. Dennett's view (in, e.g., 'Mechanism and Responsibility') is that folk psychology embodies the Intentional Stance toward operative systems.

⁴⁵ A. D. H. Adkins, in Chapter 2 of *From the Many to the One*, 1970, has surveyed the many respects in which the Homeric Greeks did not have our folk psychology or, indeed, the folk psychology of the Classical Greeks. His investigation "reveals a psychological landscape quite different from our own. We are accustomed to emphasize the 'I' which 'takes decisions', and ideas such as 'will' or 'intention'. In Homer, there is much less emphasis on the 'I' or decisions" (p. 15).

⁴⁶ *C&V*, p. 56.

⁴⁷ Dennett: 1978, 'Mechanism and Responsibility', p. 254; and Stephen Stich: 1983, *From Folk Psychology to Cognitive Science: The Case Against Belief*, p. 242.

⁴⁸ See, Stich: 1983, *From Folk Psychology to Cognitive Science*, p. 246; and Patricia Churchland: 1986, *Neurophilosophy: Toward a Unified Science of the Mind/Brain*, p. 481.

⁴⁹ Consider *C&V* p. 18 (written in 1931):

What a Copernicus or a Darwin really achieved was not the discovery of a true theory but of a fertile new point of view.

But also cf. *L&C*, p. 26. What Wittgenstein seems especially to value is the articulation of new perspectives on familiar matters. It is in this sense that he admires the work of Copernicus, Darwin, and Freud. This is consistent, however, with Wittgenstein's thinking some points of view are potentially dangerous. See *C&V*, p. 34 (written in 1939); and especially Wittgenstein's letter to Malcolm (6.12.45, in Malcolm's *Ludwig Wittgenstein: A Memoir*, 2nd ed., 1984, p. 101):

Unless you think *very* clearly psycho-analysis is a dangerous and a foul practice, and it's done no end of harm and, comparatively, very little good All of this, of course, doesn't detract from Freud's extraordinary scientific achievement. Only, extraordinary scientific achievements have a way, these days, of being used for the destruction of human beings. (I mean their bodies, or their souls, *or their intelligence*).
So hold on to your brains.

These sentiments might be appropriate for Wittgenstein's misgivings about neuroscience as well.

⁵⁰ Actually the imperialists do admit the dangers of *abuse* of knowledge, but that is not my concern here. See Patricia Churchland, *Neurophilosophy*, p. 482; and Paul Churchland, *Matter and Consciousness*, p. 45. For something on Wittgenstein's attitude towards the dangers of misuse of science, see his puzzling remark on the atomic bomb (*C&V*, pp. 48–49, written in 1946).

⁵¹ The first phrase is from Stich, *From Folk Psychology to Cognitive Science*, p. 246; the

other two are from Patricia Churchland, *Neurophilosophy*, p. 399.

⁵² *C&V*, p. 7 (written in 1930). Also recall the pessimism about progress in the passage quoted at note 46, and the pessimism about progress in the motto to *PI*: "It is in the nature of all progress that it looks much greater than it really is".

⁵³ C. Cherniak, 'The Riddle of the Universe and Its Solution', in *The Mind's I*.

⁵⁴ The moral problem of risk from scientific research is investigated in another context by Stich in 'The Recombinant DNA Debate', *Philosophy and Public Affairs*, 1978.

⁵⁵ This evaluation is simplistic because, among other things, it does not consider the fact that neuroscientific research is gradual, and its effects on folk psychology will not be sudden. Dennett has articulated some concerns about a gradual slide from the intentional stance in 'Mechanism and Responsibility', p. 255.

⁵⁶ For instance, Patricia Churchland, *Neurophilosophy*, p. 482. A neuroscientific attack on mental and emotional diseases should be reflected on in light of Wittgenstein's concerns about the medico-scientific attack on physical illness and injury. Stanley Hauerwas's essays on caring for the mentally handicapped (in Part III of *Suffering Presence*) are helpful here.

⁵⁷ Perhaps the new concepts will be quantitatively measureable in the way it seemed the early utilitarians had hoped pleasure and pain would be. This would solve another philosophical perplexity of interpersonal comparison, and provide a basis for what used to be known as moral science.

⁵⁸ Wittgenstein seems to suggest the possibility of this kind of compatibilism between folk psychology and psychoanalysis at *L&C* p. 23.

⁵⁹ This kind of compatibilism may be what Kant offers, in Section 3 of the *Groundwork*, as a way of reconciling rational autonomy with science. It also seems to be what Sellars hopes for at the end of 'Philosophy and the Scientific Image of Man'.

⁶⁰ Freud's notion of the unconscious, which, like neuroscience, was offered as a competing model for the explanation of behavior, has been smoothly assimilated into folk psychology – a fact exploited by Horgan and Woodward in their defense of folk psychology ('Folk Psychology is Here to Stay'). This is doubtless partly due to the fact that Freud employed the very concepts of folk psychology, belief and desire, while stretching them – some would say beyond recognition. See Wittgenstein's comments on Freud's (mis)use of the concepts of "wish-fulfillment" and "representation" in *C&V*, p. 44 (written in 1944).

⁶¹ See Dennett, 'Mechanism and Responsibility', p. 254. Compatibilism seems to be predicted by Thomas Nagel, in his discussion of split-brain research:

... it is not clear what one should do about central features of the mentalistic idea of persons which resist assimilation to an understanding of human beings as physical systems. It may be true of some of these features that we can neither find an objective basis for them, nor give them up. It may be impossible for us to abandon certain ways of conceiving and representing ourselves, no matter how little support they get from scientific research.

('Brain Bisection and the Unity of Consciousness', in *Mortal Questions*, 1979, p. 148, see also p. 164.)

⁶² Earlier versions of parts of this paper were presented to the Philosophy Department

at Virginia Tech, in December, 1986, and to the Southern Society for Philosophy and Psychology, in April, 1987. The discussions that followed were very helpful. In revising the paper I have especially benefitted from comments by Peter Barker and Jesse Bohl.

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