Inconsistencies in the Assumptions of Constructivism and Naturalism

An Alternative View

Nini Praetorius
UNIVERSITY OF COPENHAGEN

ABSTRACT. The paper discusses the flaws in the solutions proposed by philosophical positions of constructivism and naturalism of the mind–body and mind–reality problems to which Cartesian dualism gives rise. It is argued that subscribing—explicitly or implicitly—to the assumptions of these philosophical positions by two research traditions within current academic psychology, that is, social constructionism and cognitive neuroscience, the flaws and problems that these positions inherit cease to be of merely 'philosophical' interest, but become flaws in the foundations of the science of psychology. More importantly, the aim is to show how arguments in refutation of the assumptions of naturalism and constructivism in turn suggest and point to tenable alternative assumptions about the relation between mind and reality and between mind and body, which—as a matter of principle—must be taken for granted by both philosophy and psychology.

KEY WORDS: Cartesian dualism, constructivism, mind–body dualism, mind–matter dualism, mind–reality dualism, naturalism, reductionism, social constructionism

In this paper an analysis is conducted of flaws common in the assumptions of the philosophical positions of naturalism[1] and constructivism,[2] by which two prominent, yet opposing, research traditions or 'schools' within current academic psychology are influenced. These are, on the one hand, the various and rapidly growing branches of present-day cognitive psychology that go under the name of cognitive neuroscience, and, on the other, the so-called 'social constructionist movement' within social psychology (cf. Robinson, 2002). It is the main aim of this analysis to show that by the adoption of the assumptions of the naturalist position by cognitive psychology and the constructivist positions by social psychology, the flaws that these philosophical positions inherit and problems to which they give rise cease to be of merely 'philosophical' interest, but become flaws and problems that threaten the foundation of scientific psychology. However, to appreciate the nature of

THEORY & PSYCHOLOGY Copyright © 2003 SAGE Publications. VOL. 13(4): 511–539
[0959-3543(200308)13:4;511–539;034692]

the flaws in the assumptions of naturalism and constructivism and their consequences, it is necessary to expose their roots as they originated within philosophy.

The Historical Origin of Naturalism and Constructivism within Philosophy

The philosophical positions of naturalism and constructivism—just like their classical materialist and idealist forerunners—represent attempts to solve the problems about the relation between mind and body and between mind and reality that arose some 400 years ago as a consequence of the Cartesian division of reality into two fundamentally different and independently determinable parts or 'realms', of mind and matter. For its part, this division, known as mind–matter dualism, was Descartes' attempt to solve the problems that arose at a time when it seemed that a mathematical, quantitative description of the world was sufficient to describe the behaviour of objects in material reality. Thus, knowledge of an object's geometrical form, motion, mass and solidity was all that was necessary to account for its motion relative to other objects. It was natural to suppose, therefore, that these properties were the only ones that objects 'really' possessed, and that the other characteristics of objects, for example their colour, smell, warmth, coldness, taste and other non-quantifiable properties, were only apparent, and in some way or other dependent on ourselves. Such properties or phenomena, as Galileo put it, were merely 'names residing solely in the sensitive body' (Galileo, *Il Saggiatiore*, 1623, in Hearnshaw, 1989, p. 60). It had to be admitted, however, that in a number of respects our bodies are also entities and 'mechanisms' resembling 'lifeless', material objects—but if we ourselves are a kind of mechanism, how then could any event not describable in physical terms take place in us?

Descartes 'solved' these problems by modernizing the Christian concept of the soul, making it a 'realm' for all the faculties, qualities and phenomena for which there was no longer room in the mechanistic world-view. The soul became the domain to which experiences, sensing, beliefs, feeling, free will and thoughts belonged (Descartes, 1637/1967). However, with this division of reality into a 'physical' and a 'mental' part arose a number of puzzling and intractable problems, which have kept philosophers busy ever since. There was first the problem of how, if at all, there could be a reconciliation between the 'material' and the 'mental'. (This is the so-called psychophysical or ontolological mind–body problem.) And, second, there was the problem that if the ideas and perceptions of objects residing in our minds to which we have immediate access are the only phenomena the existence of which we can be certain, then what guarantee do we have that those ideas are true, or that the objects perceived are material? (This is the so-called

epistemological mind—reality problem concerning the status of our knowledge about what exists in material reality.)

Present-day naturalism and constructivism share the assumption with classical materialism and idealism that these mind–matter problems may actually be solved, and that the way to do so is by denying the independent existence of either one or the other 'realm'—in effect, by reducing the one to the other. The basic assumption of constructivism is that what we take to exist in material reality is entirely dependent on, varies with and, thus, is a mere product of the conceptions, categorizations and descriptions we happen to 'invent' or 'fabricate' about reality and things in the course of our action in different situations—scientific and everyday situations alike. Hence, these things do not exist independently of such situations, categorizations and descriptions, but only by virtue of our descriptions of them and conceptions about them invented by our minds. The basic assumption of naturalism is that only what may be accounted for in terms of the natural sciences exists objectively in reality. Furthermore, it is the intuition of the steadily growing number of (especially Anglo-American) philosophers who subscribe to naturalism that physics is an adequate explanatory basis for all phenomena that have physical causes and effects, including mental phenomena by virtue of having such causes and effects.[3] According to this intuition, mental phenomena—like all other phenomena belonging within the 'natural order of things'—must therefore in principle be accounted for and explained in the scientific terms of physics.

In what follows, I shall discuss the solutions proposed by naturalism and constructivism of the epistemological mind–reality problem and the psychophysical mind–body problem to which Cartesian mind–matter dualism gives rise. I shall argue that the assumptions involved in the solutions by naturalists and constructivists of these problems are untenable and lead to nonsensical consequences. Now, it is by no means the first time that it has been argued that the assumptions of naturalism and constructivism are untenable, and that their solutions of the mind–matter problems have nonsensical consequences. Some philosophers have long since realized that these problems cannot be solved, just as it has been argued that the 'Cartesian mind–matter myth' and the problems it involves need to be 'dissipated' rather than solved (Ryle, 1949). What is new in my argument is that it shows that the Cartesian division of mind and matter into two independently determinable realms, the content of each of which may be determined independently of referring to the content of the other, entails conflicting assumptions that, for reasons of principle, prevent the problems to which this division gives rise from being consistently stated, and, therefore, from being solved—be it by the natural sciences or by empirical psychological research, or indeed by philosophical investigations. Moreover, despite the apparent opposing assumptions and solutions of the mind–matter problems proposed by naturalism and constructivism, a closer analysis of

their consequences shows that they are quite similar, namely in that the notions of truth and reference or 'aboutness', so vital for any epistemological theory as well as in general for any scientific theory, are rendered indeterminate and hence ill defined. The section summarizing the assumptions of naturalism and constructivism shows how this consequence is due to the common, fallacious Cartesian assumption underlying both positions, namely that mind and matter are independently determinable 'realms'. However, more importantly, in the concluding section it will be shown that arguments refuting the naturalist and constructivist assumptions and solutions of the mind–matter problems suggest and point to tenable alternative assumptions about the relation between mind and matter, which not only have to be taken for granted by epistemology, but must also necessarily be fundamental for the development of consistent and coherent theories about both mind and matter—be it within philosophy or psychology or within the natural sciences.

Assumptions of the Constructivist Position

Classical idealism grew out of the failure to solve the problem, first formulated by Descartes, of how we can ever settle the question as to whether our knowledge is in accordance with reality existing outside our mind if all we have direct access to are ideas and experiences of reality in our minds. The solution of this problem by idealism was to abandon the assumption of an independently existing material reality, a reality existing 'external' to and thus independently of our mind. For, so the arguments went, if our notions and descriptions of material reality inevitably depend on our experience and cognition of it, it would seem just as inevitable that reality does not exist independently of our cognition and descriptions of it, and hence does not exist independently of being cognized and described (Berkeley, 1710/1930).

Until fifty years ago, classical idealism, from Berkeley through Hume, Kant and Hegel, was virtually dead. Recently, new forms of denial of realism have emerged, and once again 'something which seemed much like idealism began to become intellectually respectable' (Rorty, 1979, p. 275). Indeed, several new versions of *anti-realism* have emerged under labels such as 'deconstruction', 'pragmatism', 'ethnomethodology' and 'social constructionism'. To date the most thoroughly elaborated version of the philosophical position of constructivism, that is, constructivism taken to its logical conclusion, is due to the North American philosopher Nelson Goodman (1978, 1984). According to Goodman and other present-day anti-realists, no such thing as an independent 'objective reality' exists; the world we talk about and inhabit is nothing but a product of our descriptions, perceptions, ordering and categorization. Indeed, there is not just one world, but a

plurality of 'worlds', as many versions of worlds as there are 'perspectives' from which worlds may be 'made' by our creative minds. Thus:

> The worldmaking mainly in question here is making not with hands but with minds, or rather with languages or other symbol systems. Yet when I say that worlds are made, I mean it literally. . . . Any notion of a reality consisting of objects and events and kinds established independently of discourse and unaffected by how they are described or otherwise presented must give way to recognition that these, too, are parts of the story. If we dismiss measures of referential distance as not matters of fact because they are discourse dependent, we shall have trouble finding features that *are* matters of fact. (Goodman, 1984, p. 67)

Since reality or 'worlds', and the things that furnish any particular 'world', are mere fabrications of our creative capacities, the worlds and things we experience do not exist independently of, but only by virtue of, having been made by us. Indeed, since we can only tell how the world is 'under one or more frames of reference', and, moreover, since 'frames of reference belong less to what is described than to systems of descriptions', we cannot tell how the world is apart from or 'underneath' all descriptions and frames of reference (Goodman, 1978, p. 2). And because we cannot do so, all we have and all there is are frames of reference and ways of talking. Indeed, 'bereft of' or 'underneath' our descriptions and world-versions, reality is *nothing*; it is a world without 'things and events', a 'world without kinds or order or motion or rest or pattern' (Goodman, 1978, p. 20). This point is further brought home by the following comment:

> Indeed I have argued in *Ways of Worldmaking* and elsewhere that the forms and laws of our worlds do not lie there ready-made to be discovered but are imposed by world-versions we contrive—in the sciences, the arts, perception, and everyday practice. How the earth moves, whether a world is composed of particles or waves of phenomena, are matters determined not by passive observation but by painstaking fabrication. (Goodman, 1984, p. 21)

Anti-realist views indiscernible from those of Goodman have become fashionable not only within the arts and humanities, but even within the natural sciences. Within cognitive psychology the assumptions of constructivism have been promoted by Jerome Bruner (1986, 1990), an ardent adherent of Nelson Goodman's constructionist cum anti-realist philosophy. However, nowhere in psychology have the assumptions of the philosophical position of constructivism been more whole-heartedly welcomed than by researchers and thinkers within social psychology. This should come as no surprise, since in no other discipline of psychological inquiry does it become so overwhelmingly clear that what each of us knows, thinks and understands about the world in which we live, and how we describe what we know, think and understand, varies with and to a very large extent depends on the societies, cultures and linguistic communities to which we belong.

In his seminal paper from 1985, 'The Social Constructionist Movement in Modern Psychology', Kenneth J. Gergen summarizes the 'central contour' of what he sees as the 'emerging body of thought' of this movement: 'Social constructionist inquiry is principally concerned with explicating the processes by which people come to describe, explain, or otherwise account for the world (including themselves) in which they live' (p. 266). As Gergen rightly points out, the way people describe, explain or otherwise account for themselves and the world they live in may be different for people living in different societies and cultures; indeed, vast differences in the knowledge and description of the world may be observed within the same society or culture at different times in history. Cultural and historical relativity, in the sense of differences in the social practices, co-operation and customs of different cultures and societies, is a well-observed fact of which Gergen gives many an example from psychology and anthropology; and so are the differences in the socially agreed standards, rules, conventions and institutions that guide these practices, verbal as well as non-verbal, of different cultures and societies. It is arguably correct, furthermore, that such social practices, institutions, agreed standards and rules may bring about constraints in the opportunities available for people belonging to different cultures and societies to observe and describe the world they live in, and thus that differences may exist in what people in different societies and cultures may come to know of and how they may be able to account for this world and themselves.

However, to Gergen, this observed historical and cultural relativity has significant consequences for epistemology, in that the very notions of 'knowledge', 'true', 'observation' and 'empirical validity' themselves must be the products of socially agreed practices and customs. According to social constructionism, these notions, and thus all other notions of our cognition and language, are dependent on—indeed, *exclusively* dependent on—our socially and culturally agreed practices, rules and conventions. Thus:

> Social Constructionism views discourse about the world not as a reflection or map of the world but as an artefact of communal interchange. . . . The terms in which the world is understood are social artefacts, products of historically situated interchanges among people. From the constructionist position the process of understanding is not automatically driven by the forces of nature, but is the result of an active, cooperative enterprise of persons in relationship. (Gergen, 1985, p. 266)

According to social constructionism, then, historical and cultural *relativity* implies cognitive and linguistic *relativism*, and, thus, a position which 'asks one to suspend belief that commonly accepted categories or understandings receive their warrant through observation. Thus, it invites one to challenge the objective basis of conventional knowledge' (Gergen, 1985, p. 267). However, what social constructionism does invite one to believe is, conversely, that:

> The degree to which a given form of understanding prevails or is sustained across time is not fundamentally dependent on the empirical validity of the perspective in question, but on the vicissitudes of social processes (e.g., communication, negotiation, conflict, rhetoric). . . . Observation of persons, then, is questionable as a corrective or guide to descriptions of persons. Rather, the rules for 'what counts as what' are inherently ambiguous, continuously evolving, and free to vary with the predilections of those who use them. On these grounds, one is even led to query the concept of truth. (Gergen, 1985, p. 268)

In her widely used textbook introduction to social constructionism, Burr (1995, pp. 3–9) lists the following 'central tenets' of the movement:[4]

1. *Anti-essentialism and a critical stance towards taken-for-granted knowledge*. This tenet is in opposition to the assumption that 'the nature of the world can be revealed by observation, and that what exists is what we perceive to exist'. Indeed, according to this tenet:

   > . . . our knowledge of the world, our common ways of understanding it, is not derived from the nature of the world as it really is, but something that people construct between them. It is through the daily interactions between people in the course of social life that our versions of knowledge become fabricated. (p. 4)

2. *Anti-realism*. This tenet denies that our knowledge is a direct perception of reality. 'In fact it might be said that we construct our own versions of reality (as a culture and society) between us.' Hence, 'there can be no such thing as an objective fact' (p. 6).
3. *Historical and cultural relativism of knowledge and of the concept of truth.* According to this tenet, all forms of knowledge—whether scientific or everyday knowledge—are historically and culturally specific—including the knowledge generated by the social sciences. Hence, 'The disciplines of psychology and social psychology can therefore no longer be aimed at discovering the "true" nature of people and social life' (p. 6)—indeed the very notion of 'truth' becomes problematic, for what we regard as 'truth':

   > . . . which of course varies historically and cross-culturally, i.e. our current accepted ways of understanding the world, is a product not of objective observations of the world, but of the social processes and interaction in which people are constantly engaged with each other. (p. 6)

4. *Language is a form of action in which the world gets constructed*. 'Our way of understanding the world come not from objective reality but from other people, both past and present' (p. 6). This means that 'the way people think, the very categories and concepts that provide a framework of meaning for them, are provided from the language they use'. From this:

> . . . it follows that language too has to be more than simply a way of expressing ourselves. When people talk to each other, the world gets constructed. Our language can therefore be thought of as a form of action, and some social constructionist take this 'performative' role of language as their focus of interest. (p. 7)

> Indeed, some even hold the extreme view 'that "there is nothing outside the text", i.e. that when we talk about "reality" we can only be referring to the things that we construct through language' (p. 9).

Besides Gergen, whose theoretical position undeniably includes most if not all of these tenets, Burr lists an impressive number of social scientists and psychologists who she claims subscribe explicitly or implicitly to one or more of these tenets.[5] Suffice it here to say that social scientists who admit to espousing one or more of the social constructionist tenets should consider whether it is possible to adhere to any one of them without also committing oneself to the others. They should consider, for example, how one could accept the so-called anti-essentialist tenet that 'what we perceive to exist' is not what exists, but rather 'something that people construct between them' (cf. point 1), without at the same time subscribing to the anti-realist tenet that 'there can be no such thing as an objective fact' (cf. point 2). Or consider how one could subscribe to the tenet that language is a form of action in which 'the world gets constructed by people' (cf. point 4), without accepting 'cultural relativism of all forms of knowledge', and of the notion of truth (cf. point 3)?

It will suffice to show that the inevitable consequence of accepting any of the central tenets of social constructionism will be that the notions of 'truth' and 'reference' (or 'aboutness') will be left indeterminate and hence ill defined.

Consequences of the Constructivist Position

Any discussion of the consequences of the assumptions of the philosophical position of constructivism, in view of the similarities, would seem to be just as much a discussion of the consequences of the central tenets of social constructionism.

According to constructivism, what we take to exist in material reality is entirely dependent on, varies with and, thus, is a mere product of the conceptions, categorizations and descriptions we happen to 'invent' or 'fabricate' about reality in the course of our action in different situations—scientific and everyday situations alike. From this it follows that there can be no such things as criteria in the 'outside' world with which to determine the truth or correctness of our cognition and linguistic description of it. Natural languages, so it is assumed, are fairly autonomous systems of arbitrary signs and terms, the correct use of which is a matter of what their users may come

to agree and make conventions about. Hence, the notion of *truth*, what is true about reality and things in reality, is itself a matter of conventions and agreement among language-users. And since the conventions for cognition and description of reality and things in reality vary from culture to culture and are different for people living under different historical and social conditions, the notion of truth also varies with those cultures and conditions. Accordingly, the notion of 'truth' is just as relative as are all other terms and notions of our language and cognition, and just as arbitrary and conventional as are the conventions for how those terms and notions should be used correctly to pick out things in reality.

Now, an obvious problem with the view that the notion of truth is conventional is that it leaves completely unexplained, and indeed unexplainable, how persons and language-users can begin to develop conventions and agreement about the correct application of linguistic terms and notions without presupposing that things in the world, to which these notions and terms may be correctly applied, exist as things about which something is the case, or true, and something else is not the case, or false. And without assuming, furthermore, that persons and language-users together may correctly identify and cognize those things—and thus what is the case or true, and not the case or false about them. And without assuming, therefore, that they already have notions of true and false prior to making conventions about the correct applications of terms and the use of the notion of truth.

If the problems of neglecting these presuppositions do not appear immediately obvious, one only has to try to make sense of the following summary of the assumptions of constructivism: to be a person and a language-user is to share with others concepts of things in the world, and a language that may be used to make conventions about the correct use of terms and notions to pick out those things. However, this does not imply that in the world of which they themselves are part, identifiable and determinable things actually exist about which something is the case or true—and something else is not—and to which these notions and terms may be correctly applied. Nor does it imply that persons and language-users may together identify, determine and refer to these things in the world (including themselves and other persons) as things that exist independently of such cognitive notions or linguistic terms.

A related no less serious problem of constructivism arises from the assumption that the notions of 'true' and 'correct' are purely relative—thereby rendering accounts of anything merely relatively true and correct. This assumption is inherently self-defeating, since it would have to apply to accounts made by constructivism about its own fundamental assumptions. Gergen (1985), in the paper quoted earlier, comes very close to admitting this. According to him, by showing that observations and 'reports of one's experiences' are linguistic constructions, guided and shaped by historically

contingent conventions and discourse, social constructionism 'is casting doubt on the processes of objective warranting'. However:

> Constructionism offers no alternative truth criteria. Accounts of social construction cannot themselves be warranted empirically. If properly executed, such accounts can enable one to escape the confines of the taken for granted. *They may emancipate one from the demands of conventions*. However, the success of such accounts depends primarily on the analyst's capacity to invite, compel, stimulate, or delight the audience, and not on criteria of veracity. Required, then, are alternative criteria for evaluating knowledge claims—criteria that might reasonably take into account existing needs for systems of intelligibility, limitations inherent in existing constructions, along with a range of political, moral aesthetic, and practical considerations. (p. 272, italics added)

Now, one may well ask with what non-conventional, and hence non-relative, concept of 'truth' do analysts go about determining, negotiating and communicating about such political, moral and practical criteria for evaluating knowledge claims? The only way in which analysts could 'emancipate' themselves from the ever-existing demands of conventions would be to assume that this 'conventionality' and 'relativism' of the notion of truth does not apply when used by constructivists to talk about such political, moral and practical criteria, nor when talking about the variability of our cognition and use of language, and the cultural and historical conditions that determine this variability. However, so to suggest would be to admit that constructivists, when talking about and determining both these criteria, variability and conditions, use a concept of truth that is different from the concepts of truth applying to the different forms of cognition and description that different cultural and historical conditions give rise to, a concept of truth somehow independent of or 'immune' to cultural and historical conditions. But so to suggest would obviously be no less self-defeating.

Rather, compelling reasons argue the impossibility of the cognitive and linguistic relativism proposed by constructivism. Indeed, the very notion of determinable cultural, social and historical differences in our cognition and description of reality would seem to preclude the assumption that the things described and cognized under such different conditions do not exist independently of, but only as products of, our language and mind. For, if things in reality did only so exist, there could be no comparison between historical, social or cultural differences in describing and cognizing them. Indeed, without the assumption that the same things or phenomena may be described truthfully (though differently in different situations, using different means of observation and description), we would have no notions of the *same things*, nor therefore of comparative historical or cultural studies of differences in our cognition and descriptions of them. The same point could be made this way: imagine that it were really the case that the notion of 'truth' varied with and hence was different in different cultures and at different historical

periods. That is, the meaning and use of the term 'true' in one culture or historical period were different from the meaning and use of the term 'true' in other cultures and historical periods. This granted, no description or knowledge of anything that was true according to one culture or historical period would be true in other cultures or historical periods. If so, communication and co-action between cultures would be not only difficult, but also quite simply impossible; and so would be any determination of differences in knowledge and description of anything between different cultures and historical periods. In short, if cognitive and linguistic *relativism* were really the inevitable consequence of cognitive and linguistic *relativity*, we would not know it.

It is not difficult to see that the consequences of the constructivist assumption about the relativism and variability of the notion of truth would render every concept of language and cognition totally arbitrary, thereby making it impossible to talk meaningfully about anything. It is an assumption to the effect that, on the one hand, we can indeed use language to talk truthfully and in non-arbitrary ways about the conditions that determine (culturally, historically, etc.) our cognition and descriptions of ourselves, reality and the different situations in which we find ourselves in reality, and yet, on the other, we cannot use language to communicate and talk truthfully and in non-arbitrary ways about that which these conditions concern, that is, ourselves and things that exist in the reality of which both we ourselves and the things are part. Indeed, since nothing exists independently of our cognition and language, but only by virtue of the conceptions and notions of our minds and language, then, according to constructivism, it simply makes no sense to say that the categories of our minds and the notions of our language may be used correctly—or incorrectly—to pick out anything that is different from and which may be distinguished from language and those terms, concepts and categories. If so, the key concepts of language and cognition such as 'reference', or 'aboutness', 'true' and 'false' become meaningless—and with them all other concepts of cognition and language.

In conclusion, what proponents of constructivism crucially fail to see is that what we say about the existence of reality, and the possibility of having knowledge of and putting forward true descriptions of reality, inevitably has consequences for what we may say about the existence of persons, and the knowledge and descriptions of persons about themselves. In particular, they fail to see that we cannot raise any doubts or questions about the independent existence of reality, or about the possibility that reality exists as something about which we may have objective knowledge, and of which we may put forward true descriptions, without at the same time doubting or questioning our own objective existence and the truth of any cognition and description of ourselves. Indeed, we cannot do so without automatically cutting ourselves off from saying anything sensible about the persons who

do this cognizing and carry out the descriptions of themselves and the reality of which they are part—be it in everyday or in scientific situations.

Assumptions of the Naturalist Position

The basic assumption of naturalism is that only what may be accounted for in terms of the natural sciences exists *objectively* in reality. Furthermore, everything that so exists has physical explanations. According to Warner (1994), it is the prevailing view in Anglo-American analytic philosophy today that physics is an adequate explanatory basis for all phenomena that have physical causes and effects—including mental phenomena by virtue of having such causes and effects. The thesis about the explanatory adequacy of physics is formulated by David Lewis (1971) as:

> . . . the plausible hypothesis that there is some unified body of scientific theories, of the sort we now accept, which together provide a true and exhaustive account of all physical phenomena (i.e. all phenomena describable in physical terms). They are unified in the sense that they are cumulative: the theory governing any physical phenomenon is explained by theories governing phenomena out of which that phenomenon is composed and by the way it is composed out of them. The same is true of the latter phenomena, and so on down to the fundamental particles or fields governed by a few simple laws, more or less conceived of in present-day theoretical physics. (p. 169)

The arguments for the explanatory adequacy of physics for all sciences, and not merely for the kinds of phenomena that traditionally have been studied within the natural sciences, go, in simple terms, like this. Because everything physical has physical causes and effects, then everything having physical causes and effects must be something physical, truly and exhaustively accountable in physical terms. Since mental phenomena, such as pain or beliefs about reality, have physical causes (are caused by physical states and operation of our brains) and effects (pains as well as beliefs about reality may make us act in particular ways that have physical effects), then mental phenomena such as pains and beliefs must themselves be physical phenomena, and hence be accountable in physical terms. Indeed, so it is believed, they must in principle be accounted for and explained in terms of 'fundamental particles or fields governed by a few simple laws, more or less conceived of in present-day theoretical physics' (Lewis, 1971, p. 169). Thus, if it is assumed to follow trivially from the thesis about the explanatory adequacy of physics that physical effects have physical explanations, then it also follows that the pains and beliefs that explain these effects are themselves ultimately completely describable and explainable in terms of fundamental physics (cf. Warner, 1994, p. 2). Dennett (1991) sums up these assumptions and intuitions of the naturalist position: 'The prevailing

wisdom, variously expressed and argued for is *materialism*. There is only one kind of stuff, namely *matter*—the physical stuff of physics, chemistry and physiology—and the mind is somehow nothing but a physical phenomenon' (p. 33)

Conversely, according to this position, it does not make sense to talk about the objective existence of such things as beliefs, thoughts and other mental phenomena—except as phenomena somehow or other composed of physical matter and hence reducible to and accountable for as something purely physical.[6] As put by David Charles (1992): '[The] physicalist intuition is expressed by a certain ontological thesis: the physical is what the mental is composed of. The physical constitutes the basic building blocks of the universe, and everything is made up from these' (p. 274).

Even strong opponents of physicalist reduction, for example John Searle, Thomas Nagel and Collin McGinn, share the naturalist assumption, almost universally held by the scientific community, that everything that exists objectively in the universe must be of a physical nature, and thus must have physical explanations. To psychological researchers adhering to naturalism—in particular those working within the various and rapidly growing branches of cognitive neuroscience—this assumption fixes the limits to what may and what may not be acceptable psychological theorizing. Hence, a psychological theory that is not compatible with the assumption of the purely physical nature of the human mind-brain system, or a theory that claims non-physical psychological entities, is not scientific and can be ruled out a priori. Indeed, neither theories nor data from research on psychological phenomena and events can attain scientific status unless they can be made consistent with the rest of the natural sciences. (For a presentation and discussion of various versions of naturalism in psychology, see Seager, 1991.)

A popular modern example of this naturalist view within psychology is presented by Tooby and Cosmides (1996) thus:

> The realization that the human mind is densely multimodular has propelled modern psychology into a new theoretical landscape that is strikingly different from the standard empiricist approaches of the past. [By 'the past' is meant the first phase of the cognitive revolution and its model of the brain as a digital computer.] In consequence, the outlines of the psychological science of the coming century are getting clearer. In this new phase of the cognitive revolution, discovering and mapping the various functionally specialized modules of the human brain will be the primary activities. Even more fundamentally, psychologists are starting to put considerable effort into making their theories and findings consistent with the rest of the natural sciences, including developmental biology, biochemistry, physics, genetics, ecology, and evolutionary biology: Psychology is finally becoming a genuine natural science. (pp. xiv–xv)

Now, it could well be argued that the philosophical position of naturalism spans a wide variety of physicalist assumptions, ranging, at the one extreme, from the 'hard-nosed' reductionist type A materialists (e.g. identity theorists like Churchland [1981], Dennett [1991], Place [1990] and Smart [1991], espousing different versions of eliminative or reductive materialism), to, at the other extreme, the 'soft-nosed' non-reductionist type B materialists (e.g. Fodor [1987], McGinn [1991], Nagel [1994] and Searle [1992, 1997], espousing non-reductionist physicalism). However, on closer inspection any significant differences between the views of these extremes seems to vanish, as 'soft' materialists face the impossibility of accounting satisfactorily for how non-reducible mental features and subjective qualities of our consciousness may nevertheless be considered phenomena belonging within 'the natural order of things', and hence—on a par with other phenomena within this order and sharing its ontology—are phenomena that are explainable in terms of the natural sciences.

Take, for example, Searle's attempt to account for conscious or mental phenomena from within the position he calls biological naturalism. According to Searle (1997, p. xiv), consciousness is a qualitative, subjective and irreducible 'mental' phenomenon, and at the same time a natural part of the 'physical' world, by virtue of being a feature of the brain at the higher macro levels, which is caused by lower-level micro-processes in the brain. The latter claim is to be understood ontologically in this way: 'What I really mean is consciousness qua consciousness, qua mental, qua subjective, qua qualitative is physical, and physical because mental' (Searle, 1992, p. 15).

The 'analysis' that leads Searle to maintain both that brain processes '*cause* consciousness' and that 'consciousness is itself *a feature of the brain*' provides us, according to Searle (1997), 'with a solution to the traditional mind–body problem, a solution which avoids both dualism and materialism' (p. 7). Indeed, it is a solution that allows us 'to accept the irreducibility of consciousness and mental states without accepting dualism' (p. 214). However, when it comes to how the assumption about the non-reductive subjective quality of consciousness and other mental states is to be reconciled with the naturalist assumption to the effect that consciousness and such states are biological phenomena, 'as much part of our natural history as digestion, mitosis, meiosis or enzyme secretion' (Searle, 1992, p. 1), Searle offers no explanation. Just like other non-reductionist physicalists, such as Fodor (1987, 1994), McGinn (1991), and Nagel (1986), who envisage that irreducible higher-order mental properties may somehow be non-reductively 'naturalized' by more advanced naturalistic scientific theories, Searle leaves the explanation with future developments of theories within the natural sciences. For:

> At this time we have to frankly confess our ignorance. Neither I nor anyone else knows right now what such a theory [which explains conscious states as purely biological states] would look like, and I think it is going to be for

> the next generations of neurobiologists to provide us with such a theory. (Searle, 1997, p. 197)

Consequences of the Naturalist Position

In what follows I shall discuss two of the basic assumptions of the current naturalist position, namely first the *epistemological* assumption that the only things existing objectively in reality are those that may be accounted for and described in the scientific terms of physics (whether in its current most advanced forms, such as quantum mechanics, or in its future developments); and second the *ontological* assumption that all phenomena that have physical causes and effects, including mental phenomena by virtue of having such causes and effects, are in principle truthfully and exhaustively accountable as purely physical phenomena.

The first assumption, reminiscent of the Galilean and Cartesian division between the 'subjective qualitative' and 'objective quantitative', would seem to imply that only those descriptions of reality and things in reality are true descriptions of what really exists when based on observations within the scientific context of physics. And it would seem to apply, conversely, that descriptions and observations of reality and things in reality obtained in all other and non-scientific situations have no claim to objective existence. According to this view, knowledge and descriptions of things in our familiar world as it appears to our scientifically 'unaided experience' concern a reality, a world of things, that does not exist independently of the 'subjective, species-specific points of view of the human mind'. Thomas Nagel (1994) expresses this view thus:

> What has made modern physical science possible is the method of investigating the observable physical world not with respect to the way it appears to our senses—to the species-specific view of our minds. . . . It was a condition for the remarkable advances [of the physical sciences] that the subjective appearances of things be excluded from what had to be explained and described by our physical theories. And what was done with those appearances instead was that they were detached from the physical world *and relocated in our minds*. The whole idea of objective physical reality depends on excluding the subjective appearances from the external world and *consigning them to the mind instead.* (pp. 65–66, italics added)[7]

The main problem with this view is that it renders both our conception of what exists in reality and our notion of truth and objectivity dependent on particular situations, scientific physical situations, in which things in reality are observed with particular opportunities of observation, and using particular descriptive systems. However, by so doing, this view ignores the dependency of scientific descriptions of physical phenomena on non-scientific descriptions of the things to which those scientifically described

phenomena are claimed to apply. The problem entailed becomes obvious if we can agree both:

1. that the point of departure for any scientific investigation must be ordinary everyday descriptions and determinations of the situations in which we find ourselves in reality and carry out investigations—scientific or otherwise—on things that exist in those situations; and
2. that any scientific description and explanation of some particular phenomena or property of things relies on and is logically related to other descriptions (non-scientific and scientific alike) of the things to which the phenomena and explanations of its properties apply.

The second point is to be understood as follows: to the extent that it makes sense to say that the general laws and explanations of, for example, classical mechanics are about the behaviour of material objects of our familiar world, such as tables and chairs, billiard balls and rocks, human as well as other physical 'bodies', then the laws and explanations of classical mechanics necessarily rely on ordinary everyday descriptions and determinations of such objects and 'bodies', existing in particular places in space at particular times. Another example, indefatigably stressed by Niels Bohr and now accepted by most physicists: the conditions for carrying out, observing and describing experiments in quantum physics (including descriptions of research design, measuring instruments, etc.) rely on descriptions that are expressed in terms of the laws and explanations of classical physics.

This dependency or logical relation between scientific descriptions—as well as between scientific and non-scientific description of reality—has important consequences. First, it means that no particular description put forward within any particular situation, using any particular descriptive system—for example a quantum physical description of the behaviour and phenomena of elementary particles of which things in reality are composed—can be sufficient or exhaustive of the things to which the description applies. But nor, second, can the descriptions on which such quantum physical descriptions rely be reduced 'away' or replaced by quantum physical description. For that would amount to reducing away the descriptions of the very conditions for carrying out experiments in quantum physics. In other words, no description of anything—scientific or non-scientific—can be identical with what it describes. If we did so claim, we would be claiming that that to which we give both an ordinary everyday description[8] and a physical description[9] is the same as that which can only be correctly described in terms of physics. However, so to claim would render our notions of 'same objects', and thus of 'same' and 'objects', completely ill defined.

That scientific theory-building is cumulative (cf. the quotation above from Lewis) means precisely that the descriptions at one level of the system rely on and, thus, are logically related to descriptions at other levels. The chain of

dependency between scientific and non-scientific descriptions—starting with everyday descriptions of things in our familiar world, and finishing with the quantum physical description of the structure of elementary particles of those things—has the consequence that it would make no sense to claim that the description of phenomena or properties of things at any particular level is more true—or just true—as opposed to the descriptions of phenomena and properties of things at other levels of the system. On the contrary, precisely because of the dependency of any description put forward at any level on other descriptions put forward at others, we cannot question or doubt the truth of any of the descriptions without questioning or doubting the truth of all the others. In particular, we cannot question the truth of everyday descriptions of things in our everyday world on which scientific investigations and descriptions of their physical properties logically depend without questioning or doubting the truth of such scientific descriptions. In effect, we cannot do so without rendering the notion of 'truth' meaningless.

Now, the view that our everyday descriptions of things in our familiar world on which scientific descriptions rely are not descriptions of what objectively exists in reality, but are rather the products of our 'subjective' as opposed to 'objective' points of view, and thus, in effect, are things that merely reside in our minds leaves us with two options that are equally problematic. Either:

1. the general explanations and descriptions of physics about the properties and structure of physical phenomena concern things that do not themselves exist objectively in reality, but rather do so in the 'realm' of our minds; or
2. the physical features investigated by the natural sciences and described in terms of molecules, atoms, elementary particles, and so on, are features of things existing in some different world or reality—a reality that is different from the 'species-specific' familiar one of which we ourselves are part and in which we carry out these investigations. Therefore, physics and its general laws do not apply to objects of our familiar world.

The epistemological assumptions of naturalism so far outlined are clear enough—and so are their unfortunate consequences. However, the second, ontological assumption to which I shall now turn—namely the assumption that all phenomena that have physical causes and effects, including mental phenomena by virtue of having such causes and effects, are in principle truthfully and exhaustively accountable as purely physical phenomena—is not at all clear. Nor—despite widespread agreement to the contrary, even among strong opponents to naturalist reduction—has anybody succeeded in making it the least bit clear as to what is meant by the claim that mental phenomena *are* physical phenomena, let alone come up with any precise formulation of the conditions under which this claim may be amenable to

empirical confirmation—whether at present or in some future development of quantum physics.[10]

Put in concrete terms, what is not at all clear is what it means to say that, for example, the feeling of pain in my thumb, or my seeing the object over there as a letter-box, are in principle completely accountable in terms, say, of quantum physics, and thus that some particular quantum physical description is a description of the pain felt in my thumb, and that some other quantum physical description is a description of my perception of a particular object as a letter-box. Nor is it at all clear how it could be determined whether either of these particular quantum physical descriptions is a correct or true description of my experience of pain in my thumb or my perception of a letter-box, respectively.

Until this is made clear we would do well to consider that for a complete quantum physical description to be a correct description of my belief or perception of a letter-box would require one of two things. Either it would require that notions such as 'letter-boxes', 'letters', 'persons', 'addresses', and all other notions involved in my belief or perception of a letter-box, were part of the conceptual apparatus of quantum physics—which they are not. (Nor are there any reasons to believe that such notions will be part of the vocabulary of any future development of quantum physics.) Or it would require that it be possible to determine when and whether a particular quantum physical description is a correct description of a particular belief about a thing, for example a letter-box, as opposed to some other thing, for example a table or a chair. However, since neither a quantum physical determination of beliefs about, say, a letter-box, nor of the actual letter-box causing my belief about it, could be made independently of 'folk' notions and determinations of such things as 'letter-boxes', we would still be in need of concepts of, as well as ways of determining things and phenomena in terms of, letter-boxes—and with them all other notions implied in the meaning of such notions in our everyday language.[11]

Now, it may of course be in principle possible that, one day, we may be able to give a complete quantum physical description of the physical and physiological working of the brain when we perceive an object as a letter-box—or when we feel pain in our thumbs. However, mere correlations between such physical states in our brain and the concurrent mental state of having knowledge or beliefs about objects in the world, or experiences of pain in the thumb, do not amount to explanations of how such mental states or experiences arise out of purely physical phenomena or states (for extensive arguments of this point see McGinn, 1991; Nagel, 1986). In particular, such correlations do not explain how mental states, such as beliefs or knowledge of object may be *about* what exists in reality, let alone be true or false about it. Nor do they explain how language and description put forward in language, arising out of some other physical states of the brain, may be used to describe the same objects, let alone explain how language

may be used to refer to and be true about them. That is, such correlations do not explain how referentiality (or 'aboutness') and truth, and thus the crucial logical properties of beliefs and linguistic propositions, arise out of physical phenomena and states that do not have those properties.

Again, it would seem that for quantum physics exhaustively and truly to account for the referentiality and truth of beliefs, knowledge or linguistic propositions, either it would require that referentiality and truth be part of the descriptive and explanatory vocabulary being used to account for the properties and behaviour of quantum physical phenomena—and thus that quantum physical phenomena are the sort of things that may refer and be truth functional—which they are not. Or it would require that mental phenomena, such as beliefs, knowledge and propositions put forward by persons about things in the world—including, of course, beliefs, knowledge and propositions about quantum physical phenomena—could be reduced to, and thus be expressed in terms of, physical phenomena, which do *not* have the logical properties of referentiality or of being true or false. In effect, it would require that, just as quantum physical phenomena, our beliefs, knowledge and propositions about quantum physical phenomena thus reduced and expressed did not refer to anything, nor would they be true or false about anything.

This is not to deny that processes and functions of the bodies and brains of persons are necessary conditions for persons to acquire knowledge of and a language in which they may put forward propositions about reality that are true—for example for acquiring knowledge of and developing scientific theories and descriptions about the physical, physiological and biological processes and functions of our organism and brain. However, neither this knowledge nor language, let alone the logical properties of referentiality and truth of knowledge and of propositions put forward in language, can be explained in terms of, be reduced to or derived from, such physical, physiological or biological functions and processes; that is, from something more basic or elementary, which does not imply the existence of knowledge, language, referentiality and truth. To assume so, and hence to assume that the notions of 'truth' and 'reference' that language shares with logic and mathematics could be thus reduced, derived or explained, we might as well assume, indeed we *would* be assuming, that logic, on which relies *par excellence* the language of the sciences, could be reduced to, deduced from and explained in terms of something more elementary or fundamental that did not imply the existence of logic—and therefore that such reduction, deduction and explanation could be accounted for without using logic.[12]

Proponents of the view that cognition, language and their logical properties of referentiality and truth could be explained in terms of or be deduced from or reduced to more basic or fundamental physical processes and biological functions would have to concede that accounts of such more basic or fundamental physical processes and functions could only be given in a

language with descriptions or expressions that were referential and truth-functional—and thus would have to be accounts that relied on the existence of referentiality and the notion of 'truth'. However, so to concede is to concede in effect that, as persons and language-users, we may well come to know about and correctly describe the physical and biological processes and states of our brain that are necessary for persons to acquire knowledge of and a language in which they may put forward propositions about reality and such processes and states of the brain, and therefore we cannot be reduced to, deduced from or explained in terms of what we know and may correctly say about such processes and states of our brains.

Although less intuitively, the refutation of the claim that quantum theory is or would be the 'explain all' of what *is*, *that* it is and *what* it is would just be a variation on the same theme. Nevertheless, for the sake of argument, let it be granted that such a basic theory existed. And let it be granted furthermore that such a basic theory *par excellence* is one that is couched in mathematical expressions and formalisms—indeed that it is the nature of the phenomena it concerns that they are only thus expressible. All this granted, we would still have to assume that the mathematical expressions and formalisms of the theory are *about* phenomena existing in reality *independently* of the mathematical descriptions and expressions used by the theory to account for them. To assume otherwise, to assume, for example, that these expressions and descriptions are part of the very ontology of the phenomena that the theory concerns, would leave us with intolerable epistemological problems. To spell it out, it would leave us assuming that mathematical formalisms and expressions are not just means for describing quantum physical phenomena, but rather are *identical* with quantum physical phenomena. For example, expressions and formalisms concerning electrons and their properties *are* electrons having these properties, or, electrons and their properties *are* mathematical formalisms and expressions.[13]

Now, if the physicalist claim of a possible reduction and explanation of the properties and capabilities of our minds to brain-states, being themselves describable in terms of basic quantum physical phenomena, were to have general validity, and thus applied in general to the capabilities of our mind to develop cognition, language and use of language, it would of course also have to apply to the capability of our minds to develop the adequate theoretical mathematical systems and expressions required to account for and formulate the theory concerning these basic physical phenomena. If so, we would come full circle. For it would be a claim to the effect that the capability of our minds to develop these theoretical mathematical systems and expressions, and thus these mathematical systems and expressions themselves, could be reduced to and explained in terms of these basic physical phenomena—and the mathematical expressions and formalisms in which they are couched. Or, put even shorter: theoretical mathematical systems, their expressions and formalisms, may be explained by and in

terms of mathematical expressions and formalisms being part of and originating from within the systems themselves. However, this would not be a feasible proposition without major changes in the foundations of current theories about mathematical systems.

The arguments presented here would seem to be arguments of principle against naturalist reduction, deduction or explanations of cognition and language as opposed to arguments about the limits of human cognition or the like,[14] which could be proven wrong empirically with the further advances of physical theory. They could only be so proven wrong provided, following advances of physical theory, referentiality, logic and truth functionality were part and parcel of physical phenomena in a way in which—at one and the same time, so to speak—accounts of such phenomena were identical with the phenomena being accounted for. That is, just as accounts of physical phenomena are *physical* phenomena, so physical phenomena are *accounts* of physical phenomena.

Consequences of Constructivism and Naturalism

The points made so far about the consequences of the epistemological assumptions of constructivism and naturalism may be summarized in this way: what constructivism has failed to see is that the possibility of talking consistently about our cognition and description of ourselves, our minds, and the different situations in which we find ourselves in reality—culturally, historically or otherwise—hinges on the possibility of giving consistent, objective and true account of reality, ourselves and these situations. What naturalism has failed to see, conversely, is that the possibility of talking consistently about reality and the properties of things existing objectively in reality hinges on the possibility of talking consistently about the various different objective and true ways in which we may cognize and describe reality and these properties in different situations.

The two positions have in common that they both fail to see that, generally, we cannot talk consistently about reality and things in reality independently of presupposing that reality and these things exist as things about which we may have knowledge and put forward propositions that are true—in both everyday and scientific situations. And they fail to see that neither can we, conversely, talk consistently about our cognition and description of things in reality without, or independently of, referring to reality and those things, nor independently of presupposing that reality and those things exist objectively and independently of this cognition and description—in both everyday and scientific situations.

Which brings us right back to why Cartesian dualism underlying constructivism and naturalism implies conflicting assumptions and, hence, why it is logically impossible to state the resulting mind–reality and mind–body

problems consistently. What follows argues why this is so, and outlines the general arguments in refutation of Cartesian mind–matter dualism.

Refutation of Cartesian Mind–Matter Dualism: An Alternative View

The general arguments in refutation of mind–matter dualism and the problems to which it gives rise about the relation between mind and body and mind and reality are not particularly complicated, nor are the arguments for the alternative assumptions by which they must be replaced. Central to these arguments is that both this dualism and consequent problems involve conflicting assumptions. On the one hand, the possibility of a polar opposition between mind and matter is assumed, which necessarily implies and requires that we may talk consistently about both mind and matter; and, on the other, it is assumed that mind and matter are independently determinable realms, in the sense that the content of each realm may be talked about and characterized independently of referring to the other. That these assumptions are conflicting becomes obvious when we consider the impossibility of talking consistently about material reality and things in reality, what they are or are not, without assuming that material reality and these things exist as things about which we have knowledge and may put forward propositions that are true—or false. Consider, conversely, the impossibility of assuming that we can talk consistently about our knowledge and descriptions of reality, without or independently of referring to reality and these things; that is, the impossibility of talking about *what* we cognize and describe, without at the same time talking about *that* which we cognize and describe.

To take a concrete example. How can we possibly talk consistently about the apples on the table 'out there' without or independently of presupposing that such things as apples and tables 'out there' are things that we may indeed have knowledge of and about which we can put forward true propositions? And conversely, how can we possibly talk consistently about our cognition and description of the apples on the table 'out there' without, or independently of, referring to and at the same time talking about the actual apples on the table in question? Without presupposing these interdependencies, neither apples on the table 'out there', nor cognition or descriptions of them, would make any sense.

Thus, rather than assuming that mind and matter are independently determinable 'realms', it would seem that the very possibility of describing and characterizing both mind and matter consistently presupposes the assumption of an interdependency between mind and matter, that is, between our cognition and description of material reality, and the material reality that exists independently of our cognition and description of it. Indeed, for the sake of epistemological consistency we shall have to presuppose that a

necessary relation exists between our cognition and description of reality and reality being cognized and described, that is, presuppose that we have knowledge of and a language in which we may put forward propositions about reality that are true. Without presupposing so, we would quite simply not know what we were talking about when we talk about reality and things in reality, let alone about our cognition and descriptions of reality and things in reality, which may be true or false.

This is an assumption that must be taken for granted as a matter of principle and be the point of departure for all our further investigations into both reality and our cognition and description of it—be it in ordinary everyday or in scientific situations. This assumption I formulated as the Principle of the General Correctness of Language and Knowledge, or just the Correctness Principle. It is a principle that implies that to be a person and a language-user is to have knowledge about reality, oneself and the situations in which one finds oneself in reality, and a language in which one may put forward propositions that are true—or false—about reality, oneself and these situations. To anticipate an obvious objection, let it be stressed that the Correctness Principle does not mean that all or every proposition put forward in language about reality and our cognition of it is true or correct—on the contrary, they may be false or incorrect. Indeed, we may very often discover and determine that they are. However, no determination of the truth of any particular proposition about reality or of our cognition and perception of it could be carried out, let alone would make sense, without presupposing that, generally, the language in which the determination is conducted may be used to say something that is correct, true or false, about that which we talk, and thus is a language to which the Correctness Principle applies.[15]

For the same reason it is a principle the validity of which cannot be proved. It can only be shown that if we do try to prove it—or, worse, try to doubt or deny it—we will involve ourselves in circularities, contradictions or absurdities. However, it is sufficient to show that attempts to prove the principle would have to presuppose the principle, and that, conversely, attempts to doubt or deny the principle would amount to assuming that we may use language to doubt or deny that we can say anything about anything, which is true.

It is important to stress, furthermore, that the assumption of the inter-dependency or necessary relation between cognition, language and reality argued above does not imply that reality does not exist independently of being cognized and described. Nor does it imply that we cannot distinguish between, on the one hand, a description of a thing or having knowledge of a thing and, on the other, the thing in reality being described or cognized. (Thus, a description or knowledge of a bread roll is not a bread roll, nor is a bread roll a description or knowledge of a bread roll.) So to maintain would amount to committing the idealist fallacy of identifying ‘to describe’ and ‘to know’ with ‘to exist’. Rather, it would seem just as necessary to assume that

things in reality that we may perceive, describe and on which we may carry out physical acts exist just as independently of our perception, description and those acts as our bodies and sense organs exist independently of the things we perceive and on which we may carry out physical acts. So although we shall have to assume that knowledge and descriptions, which may be true or false about reality, do not exist without or independently of observers and language-users finding themselves in concrete situations in reality, we shall also have to assume that things in reality being described and known exist independently of this knowledge and description. That is, we shall have to assume that a crucial *asymmetry* exists as well in the relation between knowledge, language and reality. The interdependency and asymmetry may be formulated thus: no knowledge nor any true or false propositions of things in reality exist independently of persons having this knowledge and putting forward these propositions. But neither do knowledge and propositions exist about things in reality without things in reality existing independently of this knowledge and these propositions, and as things to which this knowledge and these propositions may refer and be true or false about.

Elsewhere (Praetorius, 2000), I have analysed the consequences of the Correctness Principle for the kind of questions we can meaningfully ask—and hope to answer—about the relation between our cognition and description of reality and reality itself, just as I have analysed the implications thereof for the kind of theories we may consistently develop about perception, cognition and language—be it within philosophy, psychology or the natural sciences. One of the consequences of this principle, of immediate relevance for the mind–matter problems discussed in the present paper, is that we shall have to assume that a *logical* relation exists between the notions we use to characterize, on the one hand, our *cognition* and *description* of reality, and, on the other, *reality*, notions such as 'knowledge', 'propositions', 'reference', 'true', 'objective', and 'reality', 'things' or 'facts of reality'. This relationship is to be understood as logical in the sense that none of these notions has well-defined meanings independently of reference to the others, nor may any of them be reduced to or deduced from any of the others. For this reason alone, it will be equally impossible to reduce that to which any of these notions refer to that which any of the others refer, and thus to reduce mind to matter—or vice versa.

To this may be added the point already made that referentiality and truth are logical properties of knowledge and linguistic propositions, but not of physical, biological or physiological states or processes—by any definition of physics, biology or physiology. It may be true or false that physical and biological and physiological states and processes exist, but such states and processes cannot themselves be true or false, nor be about anything in the sense that knowledge and descriptions may be. Neither is there any way in which these logical properties of knowledge and propositions—referentiality

and truth—may be reduced to or explained in any of the terms we use to account for physical, physiological or biological states or processes. Indeed, it would seem that reasons of principle exist why these logical properties of referentiality and truth, which knowledge and propositions share with logic and mathematics, cannot be reduced to, or explained in terms of, processes and states that are more fundamental than referentiality and truth. Among these reasons is the logical impossibility of accounting for such more fundamental processes and states without describing them, and thus without implying the existence of referentiality and truth. To assume otherwise would be just as nonsensical as assuming that logic and its principles, on which the language of science relies, could be reduced to or explained in terms of something more fundamental or elementary without using logic.

From these arguments it follows that, on the one hand, the very possibility of a meaningful ontological distinction between mind and matter precludes epistemological mind–reality dualism, that is, precludes the assumption that mind and matter are two independently determinable entities or realms. And it follows, on the other hand, that the epistemological conditions for talking in well-defined ways about and distinguishing mind and matter at the same time necessitates the assumption of ontological mind–body dualism, which precludes reductionism. That is, it precludes psychological states and properties of mind, which uniquely distinguish mind from matter, being reduced to, derived from or explained in terms of matter—and vice versa.

Central to these arguments and assumptions, then, is that epistemological and ontological issues and concepts are interrelated. Thus, any consistent ontological determination and distinction between mind and matter involves epistemological commitments, that is, presupposes the assumption of a necessary relation between mind and reality (between our cognition and descriptions of reality, and the reality being cognized and described). Conversely, any epistemologically consistent account of either mind or matter involves ontological commitments, that is, presupposes the assumption of logical properties of mind that make mind fundamentally and irreducibly different from matter.

Notes

1. Which include various forms of physicalism, biologism, eliminative materialism and computational functionalism.
2. Which include structuralism and various of its deconstructivist, relativist, anti-realist or irrealist successors.
3. Thus, mental phenomena—such as pain or beliefs about reality—have physical causes in that they are caused by physical states and operation of our brains, as well as effects in that both pains and beliefs about reality may make us act in ways that have physical effects.
4. Similar tenets, characteristic of what goes by the name of social constructionism, are identified and thoroughly discussed in Kukla (2000).

5. Among those listed by Burr are Billig (1987, 1991), Hollway (1989), Kitzinger (1987), Parker (1992), Potter, Wetherell and Edwards (Potter & Wetherell, 1987; Edwards & Potter, 1992), Rose (1989) and Shotter (1993a, 1993b).
6. Contributions by philosophers espousing a variety of versions of naturalism, among them Fodor, Smart, Shoemaker, and the Churchlands, may be found in the collection by Warner and Szubka (1994). See also Block, Flanagan, and Güzeldere (1997). For an exceptionally thorough presentation and discussion of all traditional and current versions of naturalism, I refer the reader to Daniel Hutto's book *Beyond Physicalism* (2000).
7. This view of Nagel is shared by an alarming number of philosophers, ranging from 'soft' type B materialists through to 'hard-nosed' type A materialists espousing epiphenomenalism.
8. In terms of objects such as tables and chairs, cannonballs and rocks.
9. In terms of, for example, the molecular structure or properties of particles of which these objects are built up.
10. In the discussion that follows, I use quantum physics as an example of a physical theory to explain how mental phenomena may be accountable in terms of something physical. However, for this discussion, which aims to show that reasons of principle exist why no physical theory may provide such an explanation of mental phenomena, it is immaterial what physical theory I chose as an example—any example would have done equally well. This said, several attempts have been made to show how quantum physics may be an adequate explanatory basis for mental phenomena, the most prominent of which are those of Roger Penrose, who, in *The Emperor's Mind* (1989) and *Shadows of the Mind* (1994), attempts to provide an explanation of how quantum mechanical theory of the brain might explain consciousness. For other examples, see also Hagen (2001), Hiley (1996, 2001), Hiley and Pylkkänen (2001) and Penrose and Hameroff (1998),
11. Elsewhere (Praetorius, 1982, 2000) I have shown that in any attempts to account for, and thus empirically to explain, how perception or cognition occurs as the result of causal physical processes, the technical description of the stimulus (say, a physical description of the stimuli emitted from a letter-box) will always rely on an ordinary everyday description and determination of the things being perceived or cognized. Otherwise it would not be possible to maintain that the technical stimulus description applies to exactly these things or to claim that it is a description of the stimuli emitted from exactly those things. Therefore, the description at one end of the causal chain will always be identical with that at the other, and hence such explanations will inevitably be circular.
12. A similar point is made by Hilary Putnam in his book *Representation and Reality* (1988). He writes:

> The idea that there are properties of reference and truth (or falsity) possessed by words and sentences in anything that deserves to be called a language would appear to be as much of a myth [to eliminative materialists] as the idea that there are 'propositional attitudes'. But reference and truth are the fundamental notions of the fundamental exact science: the science of logic. Why don't the eliminationists speak of 'folk logic' as well as of 'folk psychology'? I

> once put just this question to Paul Churchland, and he replied, 'I don't know what the successor concept [to the notion of truth—H.P.] will be'. This is honest enough! Churchland is aware that the notion of truth is in as 'bad shape' as the notion of belief from his point of view, and accepts the consequence: we must replace the 'folk' notion of truth by a more scientific notion. But the innocent reader of Churchland's writings is hardly aware that he is also being asked to reject the classical notion of truth! (p. 60)

13. If things were that simple, there would, as far as I can see, be no need, nor any justification, for carrying out physical experiments in order to discover quantum physical phenomena and their properties, but we could make do with investigating mathematical systems from which the relevant expressions and formulae could be derived. However, not even the most ardent adherents of the Galileian doctrine that God has created the world from simple mathematical principles and formulae, I think, would adhere to this kind of 'mathematical constructivism'.
14. In the sense of *cognitive closure* (cf. McGinn, 1991).
15. Consider, for example, the case in which I mistakenly perceive and describe the object on the table as an apple—in spite of the fact that it is actually an imitation apple. And think of just how many true or correct descriptions of both apples and imitation apples I will have to know of in order to determine that and how my perception and description of the thing on the table is mistaken.

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NINI PRAETORIUS, DPhil., is a Docent Professor in the Department of Psychology, University of Copenhagen, Denmark. Her main research interests are in the philosophy of psychology and the theoretical underpinning of scientific psychological research. She is the author of *Principles of Cognition, Language and Action: Essays on the Foundations of a Science of Psychology* (Kluwer Academic, 2000). Recent papers include 'Preçis of Principles of Cognition, Language and Action' (for multiple book review in *Psycoloquy* (12(027), 2001) and 'Conditions for the Intersubjectivity of Public Knowledge and Personal Experience' (*Psyke & Logos*, 1, 2002). ADDRESS: Department of Psychology, University of Copenhagen, Njalsgade 88, DK–2300 Copenhagen S, Denmark. [email: nini.praetorius@psy.ku.dk]