1 Introduction: A Critical and Quasi-Historical Essay on Theories of Pain

Murat Aydede

1 The Commonsense Conception of Pain

Consider the ordinary situations where we perceptually interact with our immediate environment. We identify and recognize objects and their sensible features by perceiving them. Our immediate focus and interest are normally the objects of our perception, understood in the broadest possible way (states, events, processes, conditions or their sensible features, etc.). We see the apple on the table; we see its color, size, and shape, we reach and hold it, we feel its surface, we smell it, and as we bite it we taste it. In all this, our perceptual interaction with the apple is geared toward or ensues in conceptually identifying or recognizing the apple and its sensible features. Perception typically results, in other words, in deploying concepts that apply in the first instance to the objects of our perception and their sensible qualities. We perceptually categorize the apple as an apple, its color as red, its shape as roughly spherical by mobilizing (consciously or not) the relevant concepts. In short, the locus of immediate identification or recognition, that is, immediate concept application, in perception is the perceptual object and its sensible qualities. Call this kind of situation the Normal Situation (NS).[1]

Now consider situations in which we feel pain. I reach down to pick up the pencil that I accidentally dropped on the floor behind the desk. In trying to reach the pencil behind the desk, I twist my arm and orient my hand uncomfortably, and then suddenly I feel a sharp jabbing pain in the back of my hand. In frustration, I pull back and start rubbing my hand thinking that I probably got a muscle cramp or pulled a muscle fiber. I feel pain in the back of my right hand, and I think and say so. How do situations like this compare with Normal Situations?

Of course, I *recognize that* it is my *hand*, in particular the *back of my hand*, that hurts. I *realize that* the pain *started at the moment* I twisted my arm in that way. I also *realize that* something bad must have happened, *physically*, at the location I feel pain, though

I am not sure what: my guess is that it is a small muscle cramp, and I *hope that* I didn't pull a muscle string because I know this takes more time to heal and is more painful overall. But what is it that I felt in the back of my hand when I extended my arm in that way? The obvious commonsense answer is: pain, a jabbing pain, and I recognized it as such, that is, as a jabbing pain.

Prima facie, the two situations seem quite parallel. The pain I feel has a certain location and temporal properties as well as other sensible qualities like having a certain intensity and jabbing quality, just as the apple I see on the table has certain sensible qualities such as its color, size, and shape that I see and feel. Compare:

(1) I see a red apple on the table (and identify it as such).

(2) I feel a jabbing pain in the back of my hand (and identify it as such).

For (1) to be true, there must be a red apple on the table that I stand in the seeing (perceiving) relation to (and must apply my concept RED APPLE to it).[2] What needs to be the case for (2) to be true?

It is in trying to give a satisfactory answer to this sort of question that we start to realize that the noted similarities may be superficial and misleading, and that the range of possible answers are seriously constrained by one's philosophical assumptions and commitments elsewhere in one's metaphysics, epistemology, and semantics. Pondering questions of this sort is, then, a way to see how pain phenomena have provided philosophers with a fertile ground to exercise their analytical skills.

Let us start with a few observations to disentangle the dissimilarities. When I feel pain in my hand, it seems that I have a sensory experience that prompts me to attribute something to the back of my hand by deploying my concept PAIN, just as I apply the concept APPLE to the apple I see. Indeed, it seems as if I apply PAIN to something in my hand. Could this be a physical feature or condition of my hand (such as a pulled string, or a muscle spasm, or stimulation of my nociceptors located there, or an impending tissue damage)? Suppose it is a *physical condition* of some sort that occurred when I extended my arm to pick up the pencil, call this condition *PC*, and call the experience, which occasioned my attribution of pain, *E*. Then, if I attributed this condition to the back of my hand by the application of PAIN—that is, by thinking or uttering something like (2)—the following two claims would have to be true:

- I would have a pain if I had *PC* but no *E* (as would be the case if I had absolutely effective analgesics before or during the event),
- I would not have a pain if I had *E* but no *PC* (as in the case of centrally caused pain or phantom-limb pains).

In other words, our identification, that is, our application of PAIN, would track the presence or absence of a physical condition in the relevant body parts where we normally feel pain. But this seems not to be the case. Even though some sort of tissue trauma in a bodily location is *usually* the cause of the pain we feel in that location, our ordinary concept of pain is such that our attribution of pain to that location remains true even when there is nothing physically wrong with that bodily location. Contrariwise, we do not attribute pain to a damaged body part when we don't have a certain kind of experience, that is, when we don't *feel* pain there, even when we can detect the damage by other means. In short, the truth-conditions of (2) do not seem to put any constraints on how things *physically* are with my hand.[3] Indeed, the cases of phantom-limb pain have been well documented. After losing their limbs, some people do feel pain in what might be called their phantom limbs. Sometimes this condition becomes very severe and chronic. These people are in *genuine* pain. They are not hallucinating their pain or having an ersatz pain: they are feeling real pain. Moreover, their pain is not in their stump or somewhere else in their body: they experience pain as if it were in just that location on their limb if they had not lost their actual limb. The phenomenon of so-called referred pain is similar. Even though the cause of the pain felt by people with a heart condition might be in their heart, we don't say that they feel pain in their heart when they sincerely report pain in their left hand. The pain *is* in their left hand even though there is nothing physically wrong with their hand and the cause of the pain is somewhere else. In these cases, again, it seems that our ordinary concept of pain does not track something physical in just those bodily locations we feel pain. Nor does it seem to track the *peripheral cause* of pain experiences.

But once we realize this, the attribution of pain to bodily locations or locating pain in body parts becomes very puzzling. If sentences like (2) are genuine attributions of a property or condition to body parts, then it is totally mysterious what it is that we might be attributing or locating when we sincerely utter sentences like (2).

These observations go hand-in-hand with other interesting and puzzling features of pain that have been traditionally observed and discussed by philosophers: namely, their privacy and subjectivity, and the incorrigibility of their owners' testimony about their own pains. These three features contrast sharply with the features of the objects of perception in Normal Situations.

Pains are said to be *private* to their owners in the strong sense that no one else can epistemically access one's pain in the way one has access to one's own pain, namely by feeling it and coming to know one is feeling it on that basis. This sharply contrasts with the *public* nature of objects of perception in Normal Situations: the very same

apple I see on the table can be seen by others in possibly the exact way I see it, so is not private in this sense.

Pains seem also to be *subjective* in the sense that their existence seems to depend on feeling them. Indeed, there is an air of paradox when someone talks about unfelt pains. One is naturally tempted to say that if a pain is not being felt by its owner then it does not exist. Again compare the subjectivity of pains to the *objectivity* of the objects of perception in Normal Situations. The apple I see does not depend on my perceiving it in order to exist: *pace* Berkeley and phenomenalists, its existence is independent of my, or for that matter anyone else's, seeing it.

Not only do people seem to have a special epistemic access to their pains, they seem to have a very special epistemic *authority* with respect to their pain: they seem to be incorrigible, or even infallible, about their pains and pain reports. Necessarily, if it seems to me *that* I am in pain and I believe so on that basis, I am in pain. Similarly, necessarily, if I feel pain, then it seems to me *that* I am in pain and I know this on that basis. There doesn't seem to be any room for a possible gap between the appearance of pain and being in pain. In other words, there doesn't seem to be any appearance–reality distinction applicable to pain. As Kripke elegantly puts it:

> To be in the same epistemic situation that would obtain if one had a pain *is* to have a pain; to be in the same epistemic situation that would obtain in the absence of pain *is* not to have a pain. . . . Pain . . . is not picked out by one of its accidental properties; rather it is picked out by its immediate phenomenological quality. . . . If any phenomenon is picked out in exactly the same way that we pick out pain, then that phenomenon *is* pain. (Kripke 1980, pp. 152–153)

If there is no appearance–reality distinction applicable to pain, then it seems that one cannot be mistaken about one's beliefs about one's pain formed on the basis of feeling pain in the way one can be mistaken about the existence and properties of the apple one sees. In the latter case, appearances can be misleading precisely because the perceptual appearance of an apple might not correspond to what the apple is like in reality. In apparent contrast to pain, Normal Situations always involve the possibility of misperception, and thus miscategorization (i.e., misapplication of concepts).[4]

1.1 Scientists' Conception of Pain

So far we have relied in our analysis on nothing else but our ordinary concept of pain. One might think that, given the clinical importance and the urgency of pain experiences, the science of pain may have come up with a novel and more insightful conception of pain. After all, having a good conceptual grasp of one's subject matter is essential for studying it scientifically. Pain scientists, however, share much of this ordi-

nary conception of pain. This is perhaps not very surprising since the pain scientists are part of the folk. As a matter of pinning down the subject matter of their scientific study, however, the "definition" of 'pain' has always been a vexing issue for scientists, so much so that in the early 1980s the International Association for the Study of Pain (IASP) formed a subcommittee on taxonomy to impose some order on the apparently diverse usages of pain terms in the field. "Pain" itself was not left out and became the first entry in the report. The committee consisted of fourteen internationally prominent pain researchers. Their definition has been widely accepted in the field of pain research. Although the acceptance is not universal, the remaining controversy seems to relate to its formulation and details, not to its substance.[5] This canonical characterization of pain was published in 1986 in IASP's official journal, *Pain*, and went like this:

Pain: An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.

Note: Pain is always subjective. Each individual learns the application of the word through experiences related to injury in early life . . . Experiences which resemble pain, e.g., pricking, but are not unpleasant, should not be called pain. Unpleasant abnormal experiences (dysaesthesia) may also be pain but are not necessarily so because, subjectively, they may not have the usual sensory qualities of pain. Many people report pain in the absence of tissue damage or any likely pathological cause; usually this happens for psychological reasons. There is no way to distinguish their experience from that due to tissue damage if we take the subjective report. If they regard their experience as pain and if they report it in the same ways as pain caused by tissue damage, it should be accepted as pain. This definition avoids tying pain to the stimulus. Activity induced in the nociceptor and nociceptive pathways by a noxious stimulus is not pain, which is always a psychological state, even though we may well appreciate that pain most often has a proximate physical cause. (IASP 1986, p. 250)

What is remarkable about this characterization is that it embodies, and even somewhat insists on, all the features we have discussed above. It also adds that pain experiences are always unpleasant.

2 Traditional Sense-Datum Theories

So far we have talked about pain in two ways. We have said that pain is a kind of sensory and affective *experience*, but we have also talked about pains as if they were the proper *objects* of our experience or perception. This double talk is not accidental. Indeed, it is endemic in folk as well as philosophical discourse about pain. It is in fact a robust symptom of what makes pain philosophically puzzling.

When confronted with the observed puzzling characteristics of pain embodied in this double-talk, the traditional philosophical reaction was, largely, to embrace this

talk and make pain the cornerstone of so-called act–object analysis of perception, which usually took the form of a sense-datum theory typically associated with indirect realism.

Normal Situations can be analyzed as involving the perception (act) of a public object. The perceptual act on the part of the subject, in turn, is analyzed as involving an experience that typically induces conceptual categorization, that is, application of concepts to the object of perception and its qualities. This kind of act–object analysis of Normal Situations, however, is neutral about whether the perceptual experience itself can be further analyzed into another kind of act–object pair.

Consider a perfect visual hallucination of an apple on the table. Your visual experience may be said to be qualitatively type-identical to an experience you would have had if you had been actually seeing an apple on the table. Despite the absence of an actual apple, you would naturally continue to talk about an apple and its sensible qualities if you did not suspect that you were having a hallucination. In other words, you would continue to deploy your ordinary concepts as if you were applying them to an actual apple and its qualities. You would locate an "apple" on the table by thinking and saying "there is an apple on the table." You would describe an "object" as red, roughly spherical, and relatively small in size, and so on. In other words, you would attribute certain properties to what you take to be a real object. But, by hypothesis, there is no real object of the right sort located on the table or anywhere else you can visually examine. Even when you knew you were having a hallucination, it would be totally natural, and in some sense even correct, for you to talk about an "apple" and its qualities that you were seeing.

A sense-datum theorist believes that this kind of case needs to be analyzed as involving actually seeing an object that really has the sensible properties that you attribute to it in having the hallucination. This object is not, of course, an apple. But it is an object that is shaped like an apple and is really red. It is a sense-datum, a phenomenal individual that really has the qualities that it visually appears to have. Phenomenal objects, however, are no ordinary objects: they are private, subjective, and the source of incorrigible knowledge, according to sense-datum theorists. Phenomenal objects are, in some sense, internal to one's consciousness: they are not before one's sense organs.

Because this kind of nonveridical cases is phenomenologically indistinguishable from veridical perceptual experiences and because phenomenology is believed to be intrinsic to one's experience or consciousness, sense-datum theorists extend their act–object analysis of nonveridical experiences to cover veridical perception. Hence perception of the external physical reality is always indirect according to sense-datum

theorists. One perceives physical objects and their qualities indirectly by directly perceiving sense data internal to one's consciousness that resemble in various degrees the physical objects and their qualities that cause them. According to sense-datum theorists, however, we are rarely, if ever, aware of this indirection in ordinary (veridical) perception in Normal Situations. It is only critical philosophical reflection on abnormal situations like illusions and hallucinations (typically along with other considerations) that reveals that the indirection must occur.

Whatever merits sense datum theories might have with respect to genuine perception and misperception, its attraction seems undeniable when it comes to its treatment of pains and other "intransitive" bodily sensations like itches, tickles, tingles, and so on.[6] According to many sense-datum theorists, pains are paradigm examples of phenomenal individuals, mental objects with phenomenal qualities whose existence depends on their being sensed or felt, and thus are logically private to their owners who feel them. This position presumably explains the double-talk about pain being both an object and an experience, since the objects postulated are claimed to be very special: they cannot exist without the corresponding acts, that is, without someone's acts of experiencing them.[7] In other words, the concept PAIN plausibly applies to both the object part of the act–object pair in the analysis of experience and to the having of the experience that would naturally be identified with the act–object pair considered together on a sense-datum theory.

The puzzle of locating pains in body parts can be treated in more than one way within this framework. The most straightforward way is simply to take the phenomena at face value and say that pains as mental objects or sense data are literally located where they seem to be located in body parts or even in empty space (but within one's somatosensory field) where one's limb would have been before the amputation. That pains are mental particulars and depend for their existence on being sensed apparently does not *logically* preclude their being capable of having, literally, a spatial location.[8] It is not clear, however, to what extent this idea could be defended without risking incredulous looks. Pains, according to sense-datum theories, are mind-dependent objects, and many have taken this to imply that pains are internal to one's consciousness or experience, and are epistemically transparent to their owners partly because of this.[9] According to this latter view, pains cannot be literally located in physical space, but have a location in a phenomenal space or field that is somehow isomorphic to, or has systematic counterparts in, physical space. In the case of bodily sensations, this phenomenal space is sometimes called one's somatic field just as one can have a visual field that maps onto physical space.[10]

2.1 Difficulties with Sense-Datum Theories

Sense-datum theories seem to be tailormade for the peculiarities of pain experiences that we have discussed above. Indeed, their function seems to codify these peculiarities into a theory rather than explain them. After we are told how the sense-datum theories treat pains and other bodily sensations, our understanding of these don't seem to be deepened or advanced at all. Whatever puzzles we had at the start either seem to remain or be transformed into puzzles about what the theories themselves say or imply. For instance, the question about what it is that we seem to attribute to or locate in our body parts when we claim to have pains in just those parts is answered on one version of the theory by saying that we literally locate mental objects with phenomenal qualities in those parts. Furthermore, only the owner of the body can sense these objects even though they are in public space. On the other version, we are told that even though we seem to locate something in public space, appearances are misleading, we are locating private mental objects in a private phenomenal space. So pains are not, after all, located in body parts, ordinarily understood.

Pointing out the implausibility of these theories, of course, is not refutation. The defenders of these views have provided strong, often ingenious, philosophical reasons and arguments to support them. However, they don't seem to quench our intellectual thirst to understand what is going on when we attribute pains to body parts, nor do they seem to explain how there could be private subjective objects that bestow incorrigibility to their owners. Moreover, these theories seem to commit their defenders to antiphysicalism. A naturalist who is trying to understand pain phenomena within a physicalist framework could hardly admit the existence of phenomenal objects.[11] Indeed, attempts to understand pains and other bodily sensations as species of perception were motivated precisely by such concerns. The so-called perceptual theories of pain are advanced and defended on the hope that pains and other bodily sensations, contrary to first appearances, are species of information gathering that work on the same principles that govern other sensory modalities.

3 Perceptual Theories of Pain

3.1 Introduction and a Road Map

Although the question of whether pains and other intransitive bodily sensations are a form of bodily perception cuts across the question of whether they are best understood on the sense-datum model, historically at least, defending a perceptual theory of pain in the tradition of direct realism was seen as a way of avoiding the unnaturalness and the metaphysical excesses of sense-datum theories. This is most evident

in Pitcher 1970, one of the most influential and elegant early direct realist theorists who has argued extensively against sense-datum theories.[12] Pitcher formulates his main motivation in promoting a perceptual view of pain as follows:

> The obstacles [to a direct realist version of the perceptual view of pain] are some features of pain that seem to rule out [such a view], since they seem to demand either (a) that pains be mental (or at any rate nonphysical) particulars, or (b) that the awareness of pains be the awareness of subjective "sense-contents" that are not identical with anything in the physical world. My aim in the paper is to show that these obstacles are merely illusory, and there are no features of pains that force on us the mental-particulars view of pain. So although my attack on [this view] is only indirect, I nevertheless regard it as lethal. (Pitcher 1970, p. 369)

Pitcher characterizes (a) as the "act–object" analysis of pains and (b) as the "adverbial" version of it—which we will discuss below. Interestingly, he calls both of them the "mental-particulars view of pain" and treats them as equally ontologically problematic, probably because he thinks that even in the adverbial version we would still be committed to (bundles of) *qualities* that appear as irreducibly mental as any sense data (*qua* mental *objects*) are thought to be.

This sort of worry (among others) has been echoed in the works of many other perceptual theorists such as Armstrong (1962, 1968), McKenzie (1968), Wilkes (1977), and Fleming (1976). Graham and Stephens (1985), and Stephens and Graham (1987) were also explicit about the ontological concerns (among others) in developing a perceptual view of pain, what they have called a "mixed composite state account" of pain according to which "to be in pain is to be in a complex state whose components include a quale and a certain cognitive and affective attitude towards that quale. Further, we hold that the qualitative component of pain is a sensible quality of the body, not a feature of the mind. . . . One who suffers pain is in a certain sort of psychological state with respect to a sensible quality of his body" (Stephens and Graham 1987, p. 395). Newton (1989) also shares the metaphysical concerns and develops a perceptual account of pain according to which the sensuous pain quality is analyzed on the model of secondary qualities of physical objects. On her view, pain is a sensible secondary quality of body parts whose integrity is threatened by potentially damaging stimuli.

However, it would be fair to say that the most influential perceptual theorists were Pitcher and Armstrong, who developed their views about the same time and more or less independently of each other. Perhaps part of the reason for their tremendous influence was that defending a perceptual view of pain on a direct realist platform was part of their general physicalist program for naturalizing the mind in general and perception in particular. They had to deal with the intransitive bodily sensations that had

always been problematic for materialism. They offered a *systematic* approach from which their account of pain was supposed to fall out naturally.[13] Because Pitcher's and Armstrong's accounts are the most developed, complete, and well-known accounts, we will focus on their views in what follows. Indeed, there is a certain sense in which their accounts, and especially Pitcher (1970), are so well carved and responsive to the problems surrounding such theories that they constitute the ideal targets in discussing the strengths and difficulties of any perceptual views of pain, including the more recent direct realist representationalist accounts developed by Dretske (1999, 2003) and Tye (1997), as we will discuss below.

However, in order to have a better understanding of why philosophers responded to the puzzles surrounding pain and other intransitive bodily sensations in the way they did, it is important to look at the dialectics of the debate as it appeared in the late 1960s and early '70s when the perceptual theories of pain had started to be developed. The opening paragraph of Pitcher's article lays out this dialectic for us quite well as follows:

> I shall defend the general thesis that to feel, or to have, a pain, is to engage in a form of sense perception, that when a person has a pain, he is perceiving something. This perceptual view of pain will strike many as bizarre. But sense-datum theorists, at least, ought not to find anything at all odd in it: indeed, I am puzzled why philosophers of that school do not subscribe to the perceptual view of pain *as a matter of course*. Since I am not a sense-datum theorist, however, but a direct realist, I espouse what must at first appear to be an irremediably perverse position—namely, a direct realist version of the perceptual view of pain. (Pitcher 1970, p. 368)

A little later, Pitcher tentatively formulates this view thus: ". . . to be aware of a pain is to perceive—in particular, to *feel*, by means of the stimulation of one's receptors and nerves—a part of one's body that is in a damaged, bruised, irritated, or pathological state, or that is in a state that is dangerously close to being one or more of these kinds of states" (ibid., p. 371).

Why would a perceptual view of pain strike many as bizarre—including the sense-datum theorists? Isn't it evident that potentially injurious stimuli typically cause us to experience pain in just those bodily locations threatened by the stimuli? Add to this observation the discovery that throughout our body there are nerve endings specialized to respond to only potentially injurious stimuli, and the effects of these stimuli are carried through such pathways to specialized areas of the brain, and the conscious experience of pain is *normally* the result of such stimulation. Why, then, can't we regard pain experiences as perceptions of the states of our body tissues just as Pitcher proposes? The situation is even more curious with regard to sense-datum theorists. For sense-datum theories were in fact developed primarily as philosophical accounts of

perception that would do justice to phenomenology and provide a unitary explanation of both the veridical and nonveridical perception like illusions and hallucinations. Indeed this is how we introduced these theories above, by reference to visual hallucination, and noted that the sense-datum theorists extended their theory to cover all perception. Nevertheless, as the quote from Pitcher implies, the sense-datum theorists had not embraced a perceptual view of pain. To understand why the sense-datum theorists had been—along with almost every one else in fact—reluctant to regard pains and other intransitive bodily sensations as species of perception, we need to return to our initial observations about feeling pain and other bodily sensations and highlight the differences between them and perception in Normal Situations from a slightly different perspective.

Because the dialectic of the debate is rather complex, as can be seen from Pitcher's opening paragraph, it is useful to have a road map for the discussion to come in the remainder of this section. We will first (sec. 3.2) spell out the general reasons for why giving a perceptual account of pain and other intransitive bodily sensations—whether this account be an indirect (sense-datum) or direct realist account—seemed implausible and proved so difficult to develop. Second, (sec. 3.3), we will lay out how a sense-datum theory can accommodate a perceptual view of pain; in other words, we will show how sense-datum theorists could in fact subscribe to a perceptual view of pain as a matter of course, as Pitcher puts it. This will give us one version, the indirect realist version, of the perceptual view of pain. Third, (sec. 3.4), we will discuss the main proposal such a theorist could make in order to solve the main difficulty confronting perceptual theories. After briefly assessing the plausibility of such a proposal, we will, fourth, (sec. 3.5), take up the direct realist version of perceptual theories of pain and other intransitive bodily sensations, and show why such theories might indeed strike one as perverse, much more so than the indirect realist versions of the theory. As we will see, the direct realists will have the same (inadequate) resources to meet the main difficulty but will have additional problems. We will also have a discussion of so-called adverbialism and intentionalism in addressing the direct realist attempts to meet some of these difficulties. Then, in the following section (4), we will take up the more modern versions of direct realist attempts to give a perceptual account of pain: these are known as representationalist theories of pain. We will see that these views do not seem to fare any better than their predecessors.

3.2 The Main Difficulty for Perceptual Views of Pain

Here is a line of argument that brings out the intuitions behind a general resistance against a perceptual view of intransitive bodily sensations. When I feel a sudden itch

on my back, or a tickle under my armpit, or experience an intense orgasm, or a jabbing pain in the back of my right hand, what is it that I am perceiving? What is it in the relevant parts of my body that my experience represents? The answer seems to be: "I have absolutely no idea" (and, moreover, for the most part, "I don't care!"). In many cases I can identify the cause, but not always. Sometimes a particular spot on my back suddenly and intensely starts to itch for no apparent reason at all. I have absolutely no idea what, if anything, I am perceiving, let alone misperceiving. If this is the proper thing to say, then itching is a very odd form of perception if it turns out to be such. When I seem to see something, I can tell a lot about what it is that I seem to see—and not just in objectual terms: I can also talk about patches of colors, shapes, and so on, in my visual field that directly relate to the object of my perception. In other words, I can readily *conceptually articulate* what I take myself to see and what its (sensible) properties are, and in principle others can do the same regarding the same object. This is not surprising: in perception we gather information about our immediate environment which we use in crucial ways in navigating that environment. If I have no idea about the object of my perception and its properties in itching except the awareness of a certain kind of feeling (sense datum?), and an immediate desire to relieve the accompanying discomfort by scratching, then what is the point of viewing itching as a form of perception? The same goes for other intransitive bodily experiences including pain of course.

Recall that Normal Situations are those in which we are prompted by the perceptual experience involved to deploy concepts that apply, in the first instance, to the objects of our perception and to their sensible qualities. In seeing an apple on the table, we are having a visual experience as of an apple and identify or recognize *it*, not the experience but the apple, as such. Ordinarily, we are rarely—if ever—interested in our experiences in perception. However, as the line of thought above reveals, situations in which we feel pain or an itch or a tickle seem never Normal, in that the concepts we are immediately prompted to apply don't seem to apply to public objects of perception at all: the concepts we are immediately induced to apply are none other than the concepts PAIN, TICKLE, or TINGLE, and so on. What these concepts apply to, however, are not public and objective, at least in the sense that they don't seem to track a physical condition of those body parts to which they are applied or attributed, nor do they seem to track the peripheral causes of these experiences—as indeed emphasized by the IASP definition of 'pain'. As we have seen in the beginning section (1), that is wherein the mystery of intransitive bodily sensations lies that attracts philosophers' attention. Pain is the most dramatic and pronounced example of all, which has also the most serious practical (and clinical, as the case may be) urgency of all.

So there is an asymmetry in what we might call the primary locus of concept application or recognition. Whereas conceptual identification tracks public objects and their sensible properties in perception in NS, conceptual identification or recognition that occurs in having intransitive bodily sensations seems to track experiences or their features, not what these experiences may be tracking—if they do track anything public (see figure 1.1). A consequence of this asymmetry is that to the extent we are incorrigible about recognizing our experiences and their subjective and private objects—if there be any such—to that extent we are incorrigible in recognizing our pains and other intransitive bodily sensations, and this is very unlike having perception in Normal Situations, which always involve the genuine possibility of misperception and thus misidentification (misapplication of concepts) of public objects.

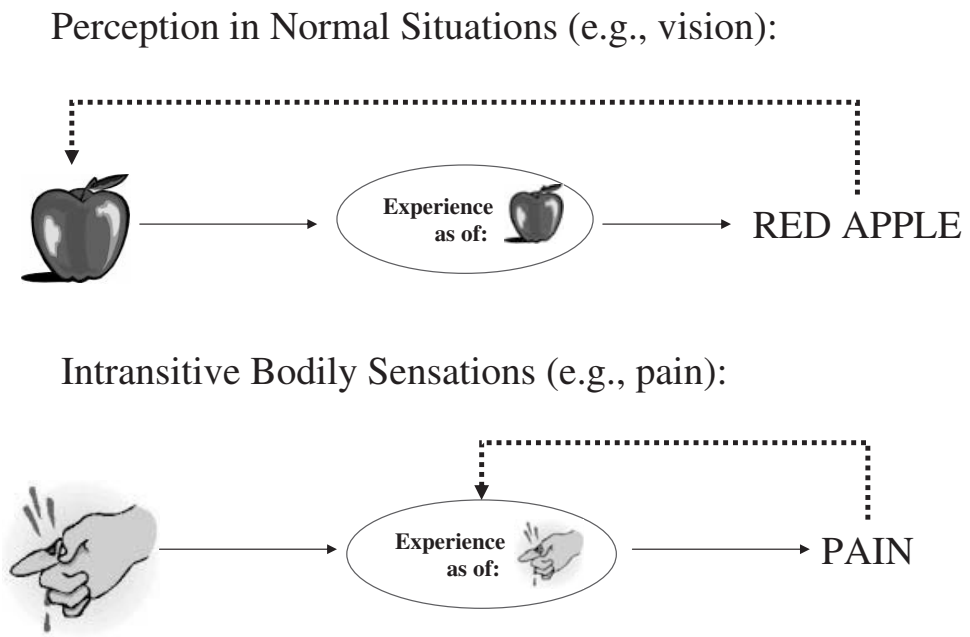

Figure 1.1
The asymmetry in concept application even when it is assumed that the structure of information flow is symmetrical in the contrast cases. (But the assumption that the information flow is identical and that the pain experience represents tissue damage may be resisted, indeed, might even be rejected on the basis of scientific considerations—see below.) Sense-datum theories analyze the experiences as themselves consisting of an act–object pair, in which case the little pictures inside the experience circles may be taken to represent the sense data involved in the pair, the immediate experiencing of which would be the act. The pair as a whole can then be taken as the indirect perception or indirect experience of the public object.

Tempted by these observations, suppose we identify genuine perception with perception in Normal Situations. Such an identification seems quite natural given the job perception is supposed to accomplish as a gatherer of information about one's immediate environment (including bodily environment). Then feeling pain and having other such bodily sensations will not count as species of genuine perception, and this is *the main difficulty* for perceptual views of pain. So the perceptual theorist has to explain or explain away why there is such an asymmetry in concept application in such a way that the result would still justify taking pains and other intransitive bodily sensations as species of genuine perception.

3.3 Indirect Realist (Sense-Datum) Theories as Perceptual Theories of Pain

Given this difficulty, the sense-datum theorists (indeed, any theorist) are justified, at least prima facie, in not subscribing to a perceptual view of pain. The fact that these theorists analyze genuine perception in NS by postulating sense data that resemble their causes to various degrees does not require that they should analyze every phenomenon involving sense data as a species of perception. This, in fact, seems to be an advantage of sense-datum theories given that feeling pain and other bodily sensations seem so unlike genuine perception. The dissimilarities between pain and perception in NS, however, are perfectly general and seem to justify one to believe in the non-perceptual character of feeling pain whether or not one is a sense-datum theorist.

In the next section, we will examine why a direct realist version of a perceptual view of pain might strike many as more perverse than an indirect realist version of it. To see this, however, we first need to make a case for how a sense-datum theorist as an indirect realist could in fact subscribe to a perceptual view of pain and other such bodily sensations.

The crucial move is to acknowledge that the concepts PAIN, ITCH, TICKLE, and so on, apply to the relevant perceptual experiences or to their internal private objects, sense data, but insist that these, namely, sense data or acts of sensing these sense data, *constitute* the perception of disordered bodily conditions of the relevant parts we attribute these sensations to. So pains are experiences in which we indirectly sense bodily damage by directly sensing the relevant sort of sense data, just as we indirectly see the apple on the table and its sensible properties by directly "seeing" an apple-shaped sense datum and its qualities. The difference is not in the structure of the perceptual process or the flow of information involved—the two cases are quite parallel. Rather, the difference is in the locus of recognition or concept application just as we have observed above. But a sense-datum theorist defending a perceptual view of pain would insist that this difference, in and of itself, has no bearing on whether the rele-

vant sense datum involved or the experience considered in general as the act–object pair (i.e., as the act of directly sensing the sense datum) is genuinely a *perceptual* act.

This amounts to denying that genuine perception is perception in NS where the recognitional locus is the public object of perception. If feeling pain is an act of direct sensing of a certain sort of sense datum, and if this sensing is in fact the indirect but genuine perception of a disordered state of a body part, then, according to the perceptual sense-datum theorist, misperception is certainly possible in having a pain, just as hallucinations are possible in visual perception. Namely, if this act of sensing or the relevant sense datum (= pain) represents a certain body part as being damaged or traumatized when this is not the case as in referred pains, phantom limb pains, and most typically centrally caused chronic pain syndromes, then the relevant act of sensing or its datum *is* a misrepresentation, a misperception. In such cases, it is not that we are "misperceiving" our pain experience (no, we correctly recognize our experience as pain), rather the experience itself misrepresents, and so we are indirectly misperceiving the condition that our relevant body parts are in.

For this move to work, the perceptual sense-datum theorist must offer an adequate account for why the locus of concept application is different in the two cases despite the same information flow structure. Recall that the main intuition behind restricting genuine perception to NS was that perception is essentially an activity of gathering information about one's immediate external environment, that is, environment external to one's mind and experiences, where this environment involves one's body or events internal to one's body. It is this information that will serve one's practical interests of often vital importance: the information about the structure of one's experience and its internal objects is useful only insofar as it is a guide to one's external environment. By anchoring perceptual recognition (i.e., conceptual identification directly induced by perception) in the external environment, genuine perception and the conceptual mechanisms that it feeds into efficiently serve us to negotiate this environment of which we are a part. Genuine perceptual experience, in other words, is transparent largely because the locus of recognition is the public object of experience and its sensible qualities. But anchoring the locus of recognition in phenomena internal to one's mind or experience will not immediately serve this vital function or will not serve it well, since the indirection involved will not be automatic or very accurate: we will be directed to relevant body parts only insofar as we succeed in using the information in our experience as a guide to its causes. In other words, pain and other intransitive bodily sensations will not be *transparent* and reliable guides to the physical conditions that they represent and typically carry information about.[14]

Given all this, internal anchoring, at a minimum, must by default be interpreted as a sign that the processes involved are not perceptual. It is the burden of the perceptual theorist (the direct as well as the indirect realist) to dislodge this default assumption and offer an explanation of why there is an anomaly in the locus of concept application in bodily sensations even though there is no difference or anomaly in the information flow.

3.4 A Common Response to the Main Difficulty

The most natural explanation, on the part of a sense-datum theorist, is that unlike other perceptual modalities, the acts of sensing a sense datum involved in feeling pain have a very pronounced negative affective quality: pains are unpleasant, awful, hurtful. This negative hedonic quality, on a sense-datum theory, may attach to either the sense data involved in pain experiences, or to the act of sensing them. Either way, it is this negative affect that explains why the locus of concept application is the acts of sensing or its internal objects, rather than the external objects of perception, that is, traumatized body parts. In other words, it is this negative quality that turns the recognitional focus onto itself or the datum it attaches to. If this is correct, then, of course, pains are equally unpleasant even when they misrepresent. This is why we pick out our acts of sensing (or their direct internal objects) rather than their external objects irrespective of their informational etiology: whether or not they are veridical, they equally hurt.

Although we have presented this sort of explanation as given by a sense-datum perceptual theorist, it is the kind of response that can be and has been co-opted, *mutatis mutandis*, by *all* perceptual theorists, as we will see below.

This seems to be a plausible explanation on a first pass. Indeed, a perceptual theorist can even run, plausibly, an evolutionary story about why these sensing acts should feel unpleasant: they represent or signal a property of body parts that tends to hinder survival. However, can the same sort of explanation be given for other intransitive bodily sensations like itches, tickles, tingles, and orgasms? Perhaps it can be done for experiencing orgasms, which are usually intensely pleasurable and have obvious evolutionary benefits. But what about others? Itches have an unpleasant quality to them that normally makes one want to scratch the spot where one itches to stop it. But tickles and tingles can be pleasant at times and unpleasant at others, as well as affectively neutral at still other times. Still, the concept of a tickle or tingle is very much like the concept of a pain in that they apply to the acts of sensing or experiencing, rather than to what external conditions these acts may be representing—if they represent anything. Indeed, if they were genuine perception of bodily conditions, they would be very odd forms of perception: nobody seems to have the slightest idea what

they are perceptions of, which is manifested in the fact that we don't have concepts that apply to what these experiences may be representing. The concepts we have are none other than the concepts TICKLE, TINGLE, which, like PAIN, don't seem to track physical conditions of the body parts that they are applied to—you can run the little thought experiments we conducted with respect to pain/PAIN in the first section. Besides, gustatory and olfactory experiences can be pleasant, unpleasant, or affectively neutral, yet the acts of sensing involved in the exercise of these sensory modalities seem to be largely transparent in that we apply the relevant concepts like SWEET, BITTER, and so on, to the external objects of these experiences in the first instance, and only derivatively or incidentally to the acts of sensing or to the experiences themselves.

These observations cast doubt on the plausibility of the explanation offered by the perceptual theorist for the asymmetry in concept application. However, the perceptual theorist can still claim that whatever the explanation might be in the case of other intransitive bodily sensations, the explanation offered for pain is essentially correct, and such a theorist may thus conclude that she has discharged the burden of proof in claiming that experiencing pain is engaging in genuine perception. This reply has some initial plausibility since pain experiences have almost always a pronounced negative affect. Nevertheless, if one suspects—as one should—that the intransitivity of certain kinds of bodily sensations as a whole must have a unified explanation, one would be wise to conclude that the offered explanation cannot be the whole story and thus is not adequate all by itself.

There is, however, quite substantial scientific evidence that there are abnormal pain phenomena where the sensory and affective aspects of pain experiences are disassociated from each other—see section 5 below. The most typical case is known as the pain asymbolia syndrome, where people who suffer from it have pain experiences without the negative affect. Interestingly, these people still identify their experience as pain, but show no bodily, emotional, and behavioral signs typically associated with the unpleasant aspect of pains. They are feeling a pain that doesn't hurt! If pains are not necessarily unpleasant, as this syndrome seems to show, it's an interesting and open question whether feeling pains without its negative affect would still retain its intransitive nature where it's conceived as an experience that doesn't normally admit a perceptual object beyond itself. (For considerations that it would, see Aydede and Güzeldere 2005.)

3.5 Direct Realist Perceptual Views of Pain

We are now in a position to appreciate why defending such a view on a direct realist version of the perceptual theory would appear to be more perverse than defending it

on an indirect realist version. As we have seen, a perceptual sense-datum theorist claims that one indirectly perceives one's disorderly bodily states by directly sensing a certain kind of sense datum, and either identifies pain with this sense datum or identifies feeling pain with the act of sensing this sense datum (which pair we might just call the pain experience); this then becomes the locus of concept application without regard to the informational etiology of the experience. In other words, the indirect realist *does have a locus for concept application*; it is the experience itself or its internal object whose direct perception constitutes the indirect perception of a bodily condition.

If one wants to run the perceptual theory on a direct realist version of it, however, one immediately runs into the difficulty of finding an appropriate locus for concept application, of finding an object, state, or event to which we apply PAIN, ITCH, TICKLE, and so on. This is because the mark of any direct realism in the theory of perception is the repudiation of perceptual intermediaries that mediate genuine perception in Normal Situations: when I see a red apple on the table, there is no object or quality distinct from the apple and its redness such that I see the apple in virtue of seeing it, or more generally, in virtue of perceiving or being aware of it. On this view, when I see an apple, I directly perceive, or am directly acquainted with, the apple and its qualities, like its redness. This view works well in veridical perception in NS: the locus of concept application is always the public object of perception, like the apple and its properties. It also explains why the concept application is the way it is even when one hallucinates or has illusions: as we have discussed above, even when one hallucinates a red apple, one applies the concept RED APPLE to what one either takes or is tempted to take to be a public object and its publicly available features, rarely (if ever) to what one believes to be a private mental object.

So what does a direct realist perceptual theorist propose that we do when we attribute pains to body parts and report being in pain? Contrary to the initial impressions one might get from reading the passage quoted from Pitcher (1970) above, pain is not identified with the disorderly condition of one's body. According to early direct realists like Armstrong and Pitcher, to feel pain in the back of one's hand is to be in an experiential state that constitutes the perception of a disorderly physical state of the back of one's hand. Thus reporting pain is reporting one's experience to that effect. Even if there is nothing physically wrong with one's hand so that the experience misrepresents, it is still true that one is having an experience to that effect. Pitcher offers an ingenious comparison between feeling pain in a part of one's body and catching a glimpse of something in order to explain the subjectivity of pains:

I maintain that the concept of a pain is remarkably similar to that of a glimpse. Just as there can be no uncaught glimpses, there can be no unfelt pains. Glimpses must be caught in order to exist, not because they have troublesome nonphysical status, but simply because we deem it a necessary condition for the existence of a glimpse that an act (or state) of catching it is going on. In exactly the same way, pains must be felt in order to exist, not because they have troublesome nonphysical status, but simply because we make it a necessary condition for the existence of a pain that an act (or state) of feeling it is going on. So the to-be-is-to-be-felt quality of a pain corresponds precisely to the to-be-is-to-be-caught quality of a glimpse. (Pitcher 1970, p. 377)

And a little further, he says the following about the privacy of pains comparing them to glimpses:

[T]he criterion for the identity of a pain is not the identity of the bodily part whose disordered state is felt, but rather the identity of the act (or state) of feeling it. Pains, then, are not interestingly private: I mean, they are private because they are particulars enjoying a special nonphysical status. They are boringly private, because their privacy really amounts only to the following triviality: each person can perform only his own acts of feeling something (or can be only in his own states of feeling something). So the undoubted privacy of pains corresponds precisely to the (perhaps doubtful) privacy of glimpses. (Ibid., p. 378)

Direct realists reject the act–object analysis of experience advanced by sense-datum theorists. In visually hallucinating a red apple on the table, one does not directly see a private mental particular; rather one is having a visual experience that is like an experience that is normally brought about when one actually sees a real red apple on the table. Direct realists, in other words, typically insist that such cases should not be analyzed as a perceiver standing in a certain perceptual relation to a private mental object. Rather the analysis involves only one particular, the perceiver herself, and her being in certain sorts of (perceptual, experiential) states or conditions that are typically brought about under certain circumstances in which one genuinely perceives something. In standard cases, when one is having a veridical perception, the experiential state of the perceiver is brought about by the actual object of her perception, and the perceiver's state is qualitatively differentiated by the causal influences of the sensible qualities of the public object.[15] In nonstandard cases like in hallucinations and illusions, the same kinds of states are brought about by different causal routes, and the qualitative differentiation of one's experiential state in such nonveridical cases is the result of deviant causal influences.

3.5.1 Adverbialism and intentionalism This sort of analysis of experience is sometimes known as adverbialism in the literature, because in perceiving a red object one is said to be in a state of perceiving something "red-ly." The theoretical import of this

way of talking is that perceiving something that is red is a *manner* of perceiving that object that would be distinct from the manner of perceiving it if the object were blue, in which case one would be perceiving it "blue-ly." Similarly when one hallucinates a red object, there is only one object, the perceiver who is sensing in a certain manner, namely, red-ly. In other words, 'red' is said to qualify not a private object but rather a state or activity of a person, that state being a manner of perceiving or sensing physical objects that are red. Compare the following analogies:

(3) Judy is dancing a waltz.

(4) The smile on John's face was mischievous.

It would be a mistake to analyze these sentences respectively as follows:

(3a) There is an object that is a waltz such that Judy is standing in the dancing relation to it.

(4a) There is a unique object which is a smile and mischievous such that John has stood in the having-on-the-face relation to it.

Rather it is obvious that they should be rendered something like:

(3b) Judy is dancing waltz-ly.

(4b) John was smiling mischievously.

The ontology of (3a) and (4a) seems costlier than that of (3b) and (4b) in that the former require two mysterious particulars *in addition to* and *distinct from* Judy and John, whereas the latter require, at least prima facie, only two particulars of a familiar sort, Judy and John, and their being engaged in an activity of a certain kind or in a certain manner. The point of adverbialism in philosophy of mind and perception is to use this maneuver with the hope that whatever the true formal semantics of adverbs will turn out to be it will not commit us to strange sorts of particulars: on the whole we feel confident about what is going on ontologically when we express a state of affairs by uttering a sentence in which one adverbially qualifies a verb.[16]

So similarly when one is having a bluish afterimage, one is not standing in the seeing relation to a certain mysterious particular that is blue in the way sense-datum theories demand. Rather, on adverbialism, one is in a state of experiencing in a certain manner, that is, blue-ly; this is usually unpacked as being in a sensing state of a certain sort, of the sort one is typically in when one is actually seeing something blue. In other words, 'blue' in reporting a blue afterimage does not qualify a physical or mental particular that is actually blue, rather it qualifies an activity of the person qua standard perceiver.

Adverbialism has various versions and is fraught with many difficulties. Moreover, not all of them are motivated by the same set of concerns. Nevertheless, for our purposes, we can take adverbialism as an attempt to get rid of mysterious mental objects in favor of metaphysically less costly states or activities of persons or manners of perceiving that qualify persons qua subjects of experience. So a pain experience, for a direct realist, is a specific manner in which tissue damage is (somatosensorially) perceived in a bodily region. When we report pain we report the occurrence of experiences understood this way—adverbially.[17]

Pitcher seems to apply this sort of adverbialist analysis to pain: "The important respects in which the nonstandard cases resemble the standard ones are obvious . . . in both, it seems to the person just as if he were feeling the disordered state of a certain part or region of his body; it feels to him, as we might also put it, as though there is something wrong in that part of region of his body" (Pitcher 1970, p. 384). Since the concept of pain applies to the act of feeling the disturbance rather than the disturbance itself, the locus of concept application is the experience. The difference between the direct realist and the indirect realist defender of a perceptual view of pain is that while the latter analyzes experience in act–object terms, the former doesn't. For the direct realist, even though the experience may be necessary for us to perceive the world, we do not in any way need to directly or otherwise perceive our experiences or their alleged internal objects in order to perceive the public world around us. We perceive the world with or through the experiences we have but we do not perceive our experiences in order to perceive their public objects.[18]

But we still need to know what exactly is going on when I truly say that I feel a pain in the back of my hand. How should utterances of this sort be analyzed on a direct realist version of the perceptual view of pain? How does the main adverbialist tenet help us understand the semantics of such utterances? Armstrong proposes the following analysis:

> 'I have a pain in my hand' may be rendered somewhat as follows: 'It feels to me that a certain sort of disturbance is occurring in my hand, a perception that evokes in me the peremptory desire that the perception should cease'. . . .
>
> The force of the word 'feels' in this formula is no more and no less than the force of the word 'feels' in 'My hand feels hot,' where this latter sentence is so used that it neither asserts nor excludes my hand being hot in physical reality. . . . Now while there is no distinction between felt pain and physical pain, there is a distinction between *feeling* that there is a certain sort of disturbance in the hand, and there actually *being* such a difference. Normally, of course, the place where there feels to be such a disturbance *is* a place where there actually is a disturbance, but in unusual cases, such as that of the "phantom limb," or cases of "referred pain," there feels to be disturbance in a place where there is no such disturbance.

> The problem of the "location" of physical pains is therefore solved in exactly the same way as that of the location of "transitive" sensations, such sensations of pressure. . . . [T]he "location" of the pain is . . . an intentional location. There feels to be a disturbance of a certain sort in the hand, whether or not there is actually such a disturbance.
>
> This account of the location of pain enables us to resolve a troublesome dilemma. Consider the following two statements: 'The pain is in my hand' and 'The pain is in my mind.' Ordinary usage makes us want to assent to the first, while a moment's philosophical reflection makes us want to assent to the second. Yet they seem to be in conflict with each other. But once we see that the location of the pain in the hand is an intentional location, that is, that it is simply the place where a disturbance feels to be, but need not actually be, it is clear that the two statements are perfectly compatible. (Armstrong 1968, pp. 314–316)

Armstrong and Pitcher seem to propose what we might call an "error theory" of pain attribution. Even though the surface structure of sentences like

(2) I feel a jabbing pain in the back of my hand

suggests that there is an attribution of pain to a bodily location, or more strictly, that I stand in the feeling relation to a pain that is located in a part of my body, the proposed analysis says that this is not what is going on. What I do when I utter (2) is an attribution of a different sort: I attribute to *myself* a *feeling state* that has an intentional content to the effect that a certain region of my body (the back of my hand) is in a physical condition of a certain sort (in a physically damaged or disordered state or in a state close to being damaged). The error is due to the fact that the pain is not in my hand; the pain, being a state of feeling or experience, is "in my mind." It is the physical disturbance that is in my hand which my feeling state represents (in a confused and indistinct way, as Descartes would put it). A moment's philosophical reflection, however, according to Armstrong, makes us realize that in uttering (2) I actually attribute an intentional feeling *state* to *myself* which in turn attributes a physical disturbance to my hand. The colloquial ways of speaking just jumble the pain with the disturbance and thus mislead us. Pains, on this view, are experiences, not objects of our experiences. Moreover, since these experiences have intentional content, they have accuracy conditions: they can be correct or incorrect; they can veridically represent or misrepresent. But even when they misrepresent, these experiences are pain experiences. So I can be in genuine pain, even though there is nothing physically wrong with my hand. The incorrigibility mentioned before reduces to one's incorrigibility about one's occurrent experiences. To the extent to which we are incorrigible in discriminating and conceptually identifying our own experiences, to that extent we cannot be wrong about our own pains. Hence the locus of concept application are the pain experiences, even though it might seem to us as if we were applying the concept of pain to bodily locations.

3.5.2 Difficulties with the direct realist perceptual view The direct realist version of the perceptual view of pain appears to have the same resources that the indirect realist version has for answering the crucial question of why we are conceptually "focused" on the experience rather than its object, the bodily disturbance. In other words, the question of why the perception involved in feeling pain does not conform to ordinary perception in Normal Situations gets answered by saying that the perceptual state of feeling pain is of such a nature that it immediately evokes in the person having it the "peremptory desire that the perception should cease." Pitcher writes, for instance:[19]

> [I]n the nonstandard cases, the person usually has an immediate inclination to change his "state of awareness," an immediate desire to want it stop, just as a person who has a pain in the normal cases usually has. In other words, the person's state of awareness in the nonstandard cases is usually every bit as unpleasant, intolerable, or whatever, as the state of awareness of someone usually is who, in standard cases, has a pain. This feature of his state of consciousness is obviously an extremely important one—indeed, probably, in most cases, its most important aspect—and as such exerts a powerful force toward assimilation: it makes us unhesitatingly subsume the nonstandard cases under the concept of pain (or of feeling pain). Conscious states having this feature are clearly of great concern to us, so that it is only to be expected that we should gather them all together under a single concept. (Pitcher 1970, p. 385)

Pitcher talks about a specific "feature of the state of consciousness" of someone in pain. This feature seems to be identified with the unpleasant (intolerable) aspect of pain experiences. Furthermore, this feature is present in the experience, whether or not this experience is veridical ("nonstandard"), and is causally efficacious in making the person undergoing it want to stop the experience. It is the feature that anchors the concept of pain to the experiences rather than their public objects.

If we were not, in some sense, aware of this "extremely important" feature, we would not, presumably, subsume the nonveridical experiences along with veridical ones under the concept of pain. Indeed it is the lack of this feature that explains, for instance, why we don't have an *ordinary* unitary concept of "seeing" that subsumes both visual hallucinations or illusions and veridical visual perceptions.

As we have noted above, this sort of explanation of the crucial asymmetry between pain and perceptions in NS is not adequate: it is at best incomplete, and at worse, wrong. We have other intransitive bodily sensations (tickles, tingles) where we have the same sort of asymmetry, but these don't exhibit the same kind of strong negative or positive affect. We also have cases of genuine perception in NS (smelling, tasting) where we have often affect but not the same kind of internal concept anchoring. So a perceptual theorist still has some important explaning to do.

However, there is a further issue about the direct realist's appeal to this sort of explanation. Recall that the basic tenet of direct realism is that we do not perceive our

experiences or anything like their alleged internal objects (sense data) in order to perceive their public objects. We perceive the world with or through the experiences we have, but we need not and in fact don't perceive them to do that. However, there is a question about to what extent it is legitimate for Pitcher to appeal to a feature of conscious pain experiences in the explanation he offers. He obviously talks about occurrent phenomenology one enjoys in having pain when he talks about this unpleasant feature. How do we become aware of this feature? In fact, there is a more fundamental question: how do we become aware of our pains so that we correctly discriminate and conceptually categorize them by thinking or uttering sentences like (2)? If feeling pain is having a perception of one's body part, the correct mode here should be external perception, but what we seem to have is rather introspection in coming to know one feels pain. For if introspection is a special first-person mode of knowing one's mental states and experiences in particular, and feeling pain is undergoing a conscious experience, then coming to know one is in pain is to engage in introspection. Therefore, if pain is a form of bodily perception, it must be a very different kind of perception: it seems to involve introspection in an *essential* way. For if we didn't know we were in pain, that is, we didn't introspect, we could not perceive the physical disturbance in a bodily region. Recall that according to the "error theory" in reporting pain we primarily report that we are in a certain feeling state, that is, we self-attribute a mental state, and only indirectly report a bodily disturbance as the intentional content of that state. So in the general case of intransitive bodily sensations and in pain in particular, it seems that we need to "perceive" (become aware of) our experiences and their phenomenal features after all in order to perceive bodily disturbances they represent.[20] So it seems that it is simply not true that we do not need to be aware of our experiences in order to be aware of the external bodily conditions they represent.[21]

Early direct realist perceptual theorists like Pitcher and Armstrong played down the importance of phenomenology.[22] Indeed, in one of the quotes from Pitcher earlier, we have seen that he regards as lethal the objection that "the awareness of pains be the awareness of subjective 'sense-contents' that are not identical with anything in the physical world." This was in line with their naturalist program in the theory of perception and mind. Both Pitcher and Armstrong developed a theory of perception as a form of belief acquisition where phenomenology did not play any significant role and beliefs are treated as functional states. Indeed, they were vehemently criticized on this ground: beliefs qua conceptually structured cognitive states don't seem to have any essential phenomenology attached to them. When perception was explained essentially as a form of belief acquisition, there was no place for the phenomenology of perceptual experiences in the theory. This is an especially acute problem when it

comes to the negative affective feature of pain experiences that these theorists had to advert to in order to explain the asymmetry in concept application in pain and in other perceptions in NS. Armstrong, for instance, talks about pain as a "perception that evokes in [one] the peremptory desire that the perception should cease" to accommodate the pain's robust affective phenomenology. Pain as a feeling state does, of course, evoke this desire in one. But Armstrong offers this as an *analysis* of pain attribution sentences. Understood this way, however, it seems lacking: one would naturally be looking to see mention of a *qualitative feature* of one's experience as the *reason* (or at least, cause) for the desire—if we are to understand this talk of desire in its ordinary sense. No such feature is ever mentioned.

The robust episodic phenomenology of affect has posed serious difficulties with these theories also because they didn't seem assimilable to perception at all. They could perhaps be aspects of perceptual states, but it was not clear how a direct realist could give a perceptual account of these aspects themselves. The general tendency was to analyze them as certain functional aspects of perceptual states as Armstrong's analysis seems to propose indeed.

4 Modern Representationalist Theories of Pain

More modern direct realist views about pain usually start with the acknowledgement that the qualitative phenomenology of all perceptual experiences are essential to their being perceptual.[23] That is because these theories are openly advanced generally as *representational* theories of qualitative phenomenology (qualia). Unlike earlier direct realists, most modern direct realists are realist about qualia. Although representationalism in this form is a general theory about the phenomenal qualities of *any* experiences, some of their defenders, aware of the problematic character of bodily sensations, have attempted to explicitly apply the theory to pain. Among the defenders of representationalism who have done this are Harman (1990), Dretske (1995, 1999, 2003), Tye (1996, 1997), Byrne (2001), and Seager (2002).[24] But the most prominent and elaborate defenders of the theory are Dretske and Tye.

Representationalism about qualia in this context needs to be understood in a robustly reductionist sense: the claim is that the representational content of an experience metaphysically constitutes and exhausts the nature of its phenomenological content. As we have seen earlier, indirect realism, especially in the form of sense-datum theories, were also advanced as representationalist theories (perhaps excluding the intransitive bodily sensations). Indeed, the old name for indirect realism was "representative realism." On these theories, in having a perceptual experience we are directly

acquainted with qualia, understood either as intrinsic qualities of experiences or as qualities of phenomenal individuals like sense data. But, at least in perception in NS, these qualities *represent* objective sensible properties of public objects in virtue of either resembling them or by being regularly caused by their instantiations—or both. In other words, on an indirect realist approach, they are distinct existences: qualia or sense-data come to represent public objects and their sensible properties in virtue of some contingent relations between them (e.g., resemblance and causation). However, in her acknowledgment of phenomenology, the reductionist direct realist cannot have such actual phenomenal objects somehow internal to one's mind or experience, nor is it likely that she can endorse the existence of qualities *intrinsic* to experiences that we can become aware of in introspection. If qualia are to be retained in one's direct realist picture of perception, these qualia need to be reduced to representational content of perceptual states. Like earlier direct realists, representationalists tend to be naturalist or physicalist.

The essential move here is the strict identification of representational properties with phenomenal ones. Even though any reductionist account would in principle do (reductionism per se does not entail naturalism), given direct realism and the naturalistic motivation behind it, reductionist accounts tend to be naturalist or physicalist. Therefore, the reductionist move brings with it an attempt to give a naturalist account of these representational properties. Accordingly, experiences are conceived as brain states with a certain functional profile. What makes these brain states experiences, in other words, is that they play a certain role in the mental economy of their possessors in virtue of their representational content. These theories therefore come with a naturalist account of how these states acquire the representational content they have. The standard story is either an ideal causal covariation theory (informational semantics) or a teleological psychosemantics or both, which are externalist theories.[25]

When applied to pain, qualia representationalism is known as the representationalist theory of pain. Tye states the theory succinctly:

> Pains . . . are *sensory* representations of tissue damage. To feel a pain, one need not have the resources to conceptualize what the pain represents. . . . One need not be able to say or think that such-and-such tissue damage is occurring. Still, the content of the pertinent sensory representation is what gives the pain its representational character. . . . A twinge of pain is a pain that represents a mild, brief disturbance. A throbbing pain is one that represents a rapidly pulsing disturbance. Aches represent disorders that occur *inside* the body, rather than on the surface. . . . (Tye 1997, p. 333)

In brief, the representational view of pain is the direct realist perceptual view of pain with a naturalist representationalist (hence, reductionist but realist) understanding of the *entire* phenomenology of pain experiences.

4.1 Standard Difficulties with Representationalism

The theory is quite controversial and has many opponents. It would probably be fair to say that the prevailing wisdom seems to be that even though pains may have representational content, or better, even though some aspects of pain phenomenology may be constituted by pains' representational content, a pain's phenomenology is not exhausted by its representational content. Many modern opponents put their objections in terms of representational–intentional versus purely sensational properties of experiences. McGinn, for instance, makes the point quite strongly:[26] "[B]odily sensations do not have an intentional object in the way perceptual experiences do. We distinguish between a visual experience and what it is an experience of; but we do not make this distinction in respect of pains. Or again, visual experiences represent the world as being a certain way, but pains have no such representational content" (McGinn 1997, pp. 8–9). This is perhaps a bit too strong, but it certainly reflects a widespread sentiment about representationalism about pain and other intransitive bodily sensations.

It appears, then, that the representational theory of pain has, at least structurally, the same weaknesses and strengths of the early perceptual direct realist theories. Just like its predecessors, it confronts the problem of explaining why pain experiences do not seem representational or perceptual at all, or as we put it earlier, why the concept of pain (hence our ordinary understanding) works the way it does, why there is an asymmetry in concept application when the direct realist representationalism in fact crucially predicts otherwise. However, in modern theorists' discussions we don't even see an explicit acknowledgement of this problem, let alone a wholehearted attempt to deal with it as the early theorists did. Recall that it is this problem (what we have called above "the main difficulty with pain") that makes any perceptual view of pain intuitively implausible.

The affective phenomenology of pain experiences is given—if at all—at most a cursory treatment, and a cognitivist/functionalist, not a representationalist, one at that, while advocating a full-blown representationalism for *all* qualia of any kind. Tye, for instance, writes:

> How is [the painfulness of pains] to be accounted for within the above proposal? To begin with, it should be noted that we often speak of bodily damage as painful. When it is said that a cut in a finger or a burn or a bruise is painful or hurts, what is meant is (roughly) that it is *causing* a feeling, namely the very feeling the person is undergoing, and that this feeling elicits an immediate dislike for itself together with anxiety about, or concern for, the state of the bodily region where the disturbance feels located. Of course, pains do not themselves normally cause feelings that cause dislike: they *are* such feelings, at least in typical cases. So, pains are not painful in the above sense. Still, they are painful in a slightly weaker sense: they typically elicit the *cognitive*

reactions described above. Moreover, when we introspect our pains we are aware of their sensory contents as painful. This is why if I have a pain in my leg I am intuitively aware of something in my leg as painful (and not in my head, which is where, in my view, the experience itself is). My pain represents damage in my leg, and I then cognitively classify that damage as painful (via the application of the concept *painful* in introspection). (Tye 1997, pp. 332–333, emphases in the original; see also Tye 1996, pp. 111–116 and 134–136)

As indicated before, this proposal mainly suffers from intuitive implausibility: it certainly doesn't appear that the hurting aspect of pain experiences is just a matter of our *cognitive reactions* to them as *ordinarily* understood. Cognitive reactions qua cognitive don't seem to have any qualitative phenomenology to them.[27] But more importantly, this move appears to mislocate the problem. The question is: in what does the painfulness, the hurting quality, of pains consist? Tye's answer seems to be: in our cognitive–conative reaction to the experience, something like having a desire for it to stop, for instance. But one would like to think that it is because the experience is painful that one desires it to stop, not the other way round.

The response therefore seems to deny that there is anything qualitative, intrinsic, or common to pains that we can identify as *their* hurting, painful phenomenology. The only qualitative content of pain experiences is, according to Tye, their representational content, that is, tissue damage along with its spatiotemporal properties. Furthermore, it is not at all clear that we need to have a concept, PAINFUL, that we apply to the experience in introspection in order to be aware of our pains as painful.[28]

4.2 Representationalism and the Difficulty of Introspecting Pains

But representationalism about pain and other intransitive bodily sensations has *additional* problems—at least externalist versions of the theory. Because phenomenal content is exhausted by their representational content, coming to know about one's experiences and their phenomenal content is coming to know about their representational content. But their representational content is what they represent. Knowing that, however, requires one to possess the concepts that one would need to use to articulate what one's experiences represent—in addition to the concepts required to articulate through what modality one is having these experiences. According to many representationalists, experiences have nonconceptual representational content, which is to say that they are not conceptually structured states. So one can have experiences even without possessing the concepts that apply to the objects they represent. But, as we have seen, perception in Normal Situations results in conceptual identification of the external objects and their properties that these perceptual experiences represent: the locus of concept application in NS is outside the mind. However, to the extent to

which qualia are introspectable features of our experiences, that is, to the extent to which the nonconceptual representational content of these states are accessible to us, to that extent we need concepts to articulate this phenomenal content, and the concepts are none other than the concepts that apply to the objective content of the experiences. So without having the concepts that apply to the objects of our experiences we cannot introspect their phenomenology. This is not to say that without the concepts we apply in perception in NS, we cannot perceive. All it says is that without such concepts we cannot introspect our perceptual experiences.[29]

This view of introspection has two disturbing consequences for representational theories of pain and other intransitive bodily sensations. One is that if the affective aspect of the phenomenology of pain experiences is not representational, as it seems not to be, then we cannot introspectively be aware of this aspect. But this is absurd: we are all too painfully aware of this aspect of pains. Indeed this "important feature of our experiences" was the ground for the early theorists' attempt to explain the pains' intransitivity and the asymmetry in concept application we discussed above. But even if the affective aspect of pain is representational, it is not at all clear how we can become aware of this aspect given the view of introspection just outlined. For we need to have the concepts that apply to what this negative affect represents in order to introspect the affect itself. But it seems that we don't have such concepts and, as a matter of fact, we don't need to have them to come to know about the unpleasantness of our pains.[30]

The second difficulty is equally serious. Suppose my liver starts to hurt and I come to fully realize this. Supposing that my coming to fully realize that I have a pain in my liver (or liver area) is at least partly the result of engaging introspection, then the process involved in my realization, according to representationalism and the theory of introspection it naturally comes with, is supposed to go like this. I have a bodily perception of my liver and its damaged condition (suppose I have a serious damage in my liver), and I am able to conceptually articulate it as perception in NS requires; so for instance, I can think and say to myself that something is physically wrong in my liver area. This is so far a perception of a bodily condition first, and then a conceptual recognition of that condition that results from this perception. Then I come to realize that I have this perception (let's say, while having it), which is a feeling state, that is, the pain experience. According to the theory, the necessary condition for my being able to realize this is that I can conceptually articulate the nonconceptual intentional content (= the representational content) of this experience, namely, that there is something physically wrong in my liver area. It is only because I can do that, or something like it, can I come to realize that I am in pain, that is, can I self-attribute

a pain experience. But it is clear that the only concept I need to have to be able to realize that I have a pain in my liver area is the concept of pain itself (and perhaps the relevant spatiotemporal—locating—concepts involved). However, the concept of pain is *not* the concept of a physical disturbance, or if we want to be even more minimalist, the concept of something being physically wrong—this is what the intransitivity of pain consists in. It is not even the concept of an experience that (mis)represents physical disturbance. It may be that every experience we classify as pain may turn out to represent some sort of physical disturbance; this may even be necessary in some suitable sense. Still, it is evident that the concept of pain minimally necessary for someone's realizing one has a pain is neither the concept of a kind of physical disturbance, nor the concept of an experience that represents a kind of physical disturbance.

5 General Assessment of Perceptual/Representational Views of Pain in the Light of Scientific Pain Research

One would like to think that naturalistically motivated philosophical approaches to pain would be in harmony with what we scientifically know about pain. Interestingly, however, the theoretical trends in scientific pain research and in philosophy seem to have gone by and large in opposite directions in the last forty years or so. While the science of pain has increasingly conceived of pain as less like perception of an objective reality and more like emotions by first drawing the sensory–affective distinction and then emphasizing more and more its affective aspect,[31] the trend in philosophy, on the other hand, has been in the other direction: as naturalism has started to become an orthodoxy in the second part of the twentieth century, philosophers have increasingly sought for ways in which they could assimilate pain to ordinary perception like vision, audition, and so on. To assess the prospects of perceptual/representational approaches to pain, it will be instructive to have a brief look at the forces that have shaped the trend in the scientific research community. This will also give us a chance to outline the underlying subpersonal mechanisms of pain processing.[32]

Up until the 1960s, the so-called specificity theory of pain had been more or less the dominant view in the medical and scientific community. This view was inspired by Descartes's discussion of a pain pathway in analogy to the idea that "pulling at one end of a rope one makes to strike at the same instant a bell which hangs at the other end" (Descartes 1664), and gained scientific credence by Müller's (1842) "doctrine of specific nerve energies." This doctrine was subsequently modified by von Frey's (1894) account of the cutaneous sensations according to which pain was subserved by the peripheral free nerve endings specialized to respond to all and only nociceptive

stimuli, which were then faithfully transmitted to the pain center in the brain. Head and Rivers (1920) suggested that a certain area in the thalamus was the pain center. Although there were other competing theories in the scientific community, the specificity theory dominated the field.[33] This was partly due to the demands of the urgent practicalities of clinical settings and the sociology of medical sciences. A simplistic theory promised a better and more effective intervention. However, by the 1960s it had been getting increasingly clear that observed facts about pain could not be accounted for on the basis of such a simplistic theory.

5.1 Two Kinds of Observed Data for the Science of Pain to Account For

There were basically two sets of observed data that prompted a search for a better theory. One set included data about the high variability of the relationship between nociceptive stimuli and the pain experience. The second set was about disassociation effects.

5.1.1 The variable link between the stimulus and pain experience The same kind of injury or the same stimuli can elicit pain of widely different intensity and quality in different people or in the same person at different times depending on the circumstances they perceive themselves to be in, their past experiences, and the previous states of their bodies—and sometimes elicit no experience at all. Conversely, sometimes pain occurs with no peripheral stimuli at all, or occurs as a result of totally unexpected stimuli. For instance, given that 40 percent of all Americans suffer from chronic pain at some period in their lives, prolonged pain in the absence of stimuli is common. Sometimes, innocuous stimuli elicit pain (allodynia). Sometimes, nociceptive stimuli elicit a disproportionately increased pain (hyperalgesia). Sometimes one feels pain in areas in one's body quite remote from the location of stimulus, and sometimes one continues to feel pain even after the stimulus is terminated (referred pain, spatial and temporal summation, persistent pain serving a recuperation–healing function). This great variability between stimulus and the pain experience is one of the scientific puzzles about pain, one that the specificity theory could not explain. Recall that the modern IASP definition of pain explicitly warns against tying pain to peripheral stimulus, just as the commonsense conception of pain distinguishes the causes of pain from the pain itself.[34]

5.1.2 The disassociation of pain affect from its sensory dimension It had been well known that certain surgical procedures, some pain syndromes, and drugs reduced or removed the unpleasantness of pain while preserving its sensory-discriminative aspects. These data typically came from patients who had undergone prefrontal

lobotomy (Freeman et al. 1942; Freeman and Wattz 1946; Freeman and Watts 1950; Hardy et al. 1952; Barber 1959; Bouckoms 1994) or cingulotomy (Foltz and White 1962a,b; White and Sweet 1969) as a last resort for their intractable chronic pain (as frequently involved in phantom limb pain, neuralgia, causalgia, severe psychogenic, and cancer pains), from patients under the effects of hypnotic suggestion (Barber 1964; Rainville et al. 1997; Rainville et al. 1999), nitrous oxide (laughing gas), and some opium derivatives like morphine (Barber 1959). These patients by and large agreed that when they were in pain, they could recognize and identify it as such, but did not feel or seem bothered by it or distressed in ways characteristic to having pain experiences. Although it is usually not recognized in the scientific and philosophical literature, there are, however, important differences among the phenomena afflicting these patients, which are manifested in patients' reports and behavior. For instance, pain asymbolia also typically produces a kind of disassociation—a rather strong kind—sometimes similar to cingulotomy patients' but interestingly different from lobotomy patients' (Rubins and Friedman 1948; Hurt and Ballantyne 1974; Berthier et al. 1988; Berthier et al. 1990; Devinsky et al. 1995; Weinstein et al. 1995).

In fact, there is evidence that pain asymbolia may be the only form of genuine disassociation (Grahek 2001). These patients, for instance, didn't react to even momentary pains like pinpricks, small cuts, or burns. Experimental pain stimuli failed to produce any recognizable affective reactions. Nevertheless, the patients insisted that the stimuli caused pain—they identified their experiences as pain (Rubins and Friedman 1948; Berthier et al. 1988; Berthier et al. 1990; Dong et al. 1994; Weinstein et al. 1995). The lobotomy and morphine patients, on the other hand, showed the usual affective reactions and symptoms when they were stimulated momentarily by normally painful stimuli. But they didn't seem to care or be bothered by their standing persistent or chronic pains. Probably, they still felt the negative affect but didn't mind it, whereas the pain asymbolia patients didn't even feel the momentary negative affect. These two cases also need to be distinguished from so-called congenital insensitivity to pain, a condition where the patients don't even report any pain experience upon various kinds of nociception—these patients don't live long (McMurray 1955, 1975; Baxter and Olszewski 1960; Sternbach 1963; Brand and Yancey 1993).[35]

It was partly the accumulation of this sort of (mostly) subjectively obtained abnormal data indicating dissociable phenomenological components of pain experiences (along with the observed variability between stimulus and pain experience discussed above) that contributed to the demise of the specificity theory and led to a search for a better theory capable of accounting for the data.

5.1.3 Endogenous modulatory mechanisms for the variable link Although a number of scientists had already proposed important modifications of or alternatives to the specificity theory that prepared the way for Melzack and Wall's gate-control theory (see figure 1.2), it was the introduction of this theory in 1965 (Melzack and Wall 1965) that initiated what might be truly termed a revolution in scientific pain research. The theory in its initial form was geared mainly toward explaining the first set of data about the variability of the link between nociceptive stimuli and pain.

According to gate-control theory, noxious stimuli from the peripheral nociceptors are carried to the spinal cord through basically two types of fibers (see figure 1.3): large myelinated fibers with faster conduction velocity (A-beta fibers) and small fibers (S) with slow conduction velocity (small myelinated A-delta and unmyelinated C-fibers—although A-beta fibers are involved in the noxious stimuli, they are not specific to noxious stimuli). Before entering the gray matter of the spinal cord the axons of A-beta fibers branch out and project to the thalamus in the brain. The other branch and the small fibers enter the subtantia gelatinosa (SG) (laminae I and II) and laminae IV and V, in the dorsal horn of the gray matter of the spinal cord. The gating mechanism was postulated to be somewhere in these laminae. This gate was conceived as a neural mechanism (see figure 1.4) that acts like a modulating or regulating system that controls the amount of nerve-impulse transmission from the periphery to the spinal cord transmission cells (T-cells), that is, to the second-order nerve cells that transmit the modulated output of the gate to the higher brain structures. Under normal circumstances, the theory proposed, it is necessary for the systems in the brain to interpret the incoming signals as pain that the output of this gate reach or exceed a certain critical level. This output is regulated in the gate by various excitatory and inhibitory factors. From a theoretical viewpoint, the most interesting of these is the descending inhibitory signals from the brain.

The proposal of a modulatory gating mechanism has since then generated a great deal of scientific research, which uncovered a great variety of endogenous modulatory (inhibitory as well as excitatory) mechanisms both local (segmental) within the dorsal horn of the spinal cord and descending from various areas in the brain stem and the brain. There are also mechanisms within the brain stem and the brain. The general thrust of the gate-control theory was the postulation of endogenous modulation of the nociceptive transmission to higher areas in the brain in order to explain the great variability of the link between the stimulus and the pain experience. This much has certainly been confirmed by later scientific research—although this research has uncovered many more modulatory mechanisms of various kinds not envisaged by the gate-control theory as even a quick look at the recent work could readily reveal.[36]

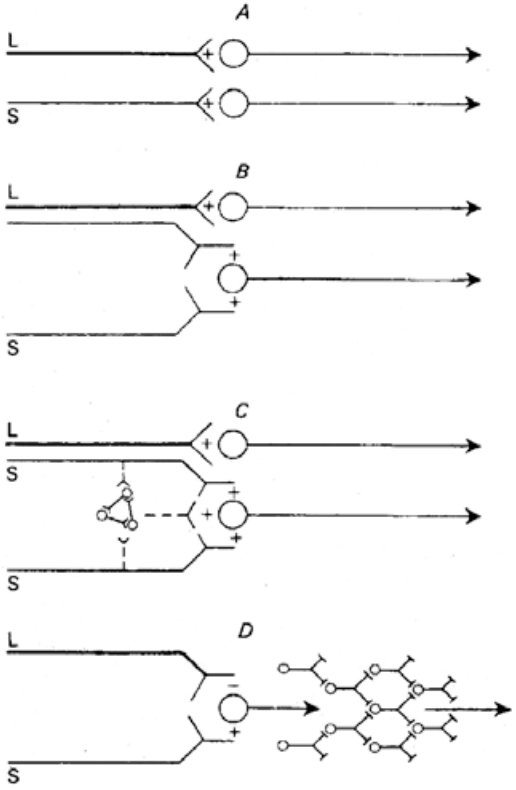

Figure 1.2

Schematic representation of the development of conceptual models of pain mechanisms before the introduction of gate–control theory. ***A***: The specificity theory espoused by von Frey (1894), according to which large fibers (L) transmitted touch, and small fibers (S) transmitted pain impulses in separate, specific, straight-through pathways to touch and pain centers in the brain. ***B*:** Goldscheider's (1894) summation theory, showing convergence of small fibers onto a dorsal horn cell (touch was assumed to be carried by large fibers). ***C***: Livingston's (1943) conceptual model of reverberatory circuits underlying chronic pathological pain states where constant nociceptive signals from the periphery generate prolonged activity in the self-exciting chain of neurons in the dorsal horn, which then transmit abnormally patterned volleys of nerve impulses to the brain. ***D***: Noordenbos's (1959) sensory interaction theory where large fibers inhibit (–) and small fibers excite (+) central transmission neurons, which consist of a multisynaptic system that projects to the brain.

Note that these models propose increasingly more sophisticated modulatory mechanisms that sever the reliability of the correlations between stimuli and pain sensation. What we see here is an increasing theoretical sophistication in attempts to explain the first set of observed data. (Adopted from Melzack and Wall 1988, caption modified).

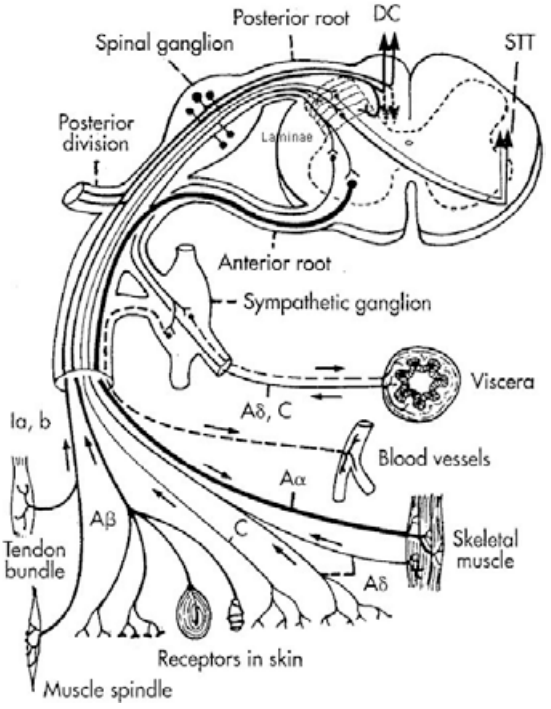

Figure 1.3

A schematic showing peripheral nerve fibers entering the spinal cord. The laminar structure of the dorsal horn is indicated. There are about 6 such laminae within the dorsal horn, 10 in the whole ipsilateral white matter (i.e., in the one wing of the butterfly shaped structure). The first two laminae at the beginning of the dorsal horn are called subtantia gelatinosa (GS). Note the branching out of the fast A-beta fibers into the dorsal column (DC) without entering the horn. Note also the free endings of nociceptive A-delta and C-fibers. The reflex arc is also shown. STT, the spinothalamic tract (a major ascending nociceptive pathway—T-cells). (Modified from Bonica 1990.)

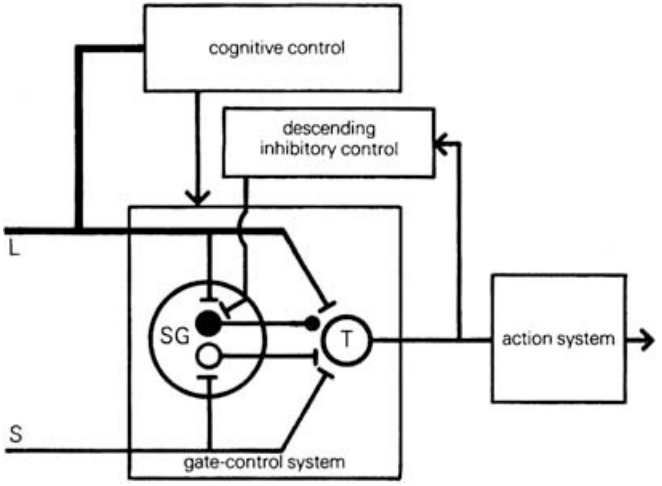

Figure 1.4
This is the schematic of the gate–control theory as modified later by Melzack and Wall (1983). The new model included excitatory (white circle) and inhibitory (black circle) links from SG to T-cells as well as descending inhibitory control from some brain-stem structures. The round knob at the end of the inhibitory link implies that its actions may be presynaptic, postsynaptic, or both. All connections are excitatory, except the inhibitory link from SG to T-cells. (Slightly modified from Melzack and Wall 1983.)

Nociception seems to be unique among the sensory systems in general in incorporating a distinct endogenous modulatory control system.

5.1.4 Functionally distinct underlying mechanisms for the disassociation effects As an attempt to explain the second set of observed data about the affective aspects of pain and its disassociation from its sensory aspects, Melzack and Casey (1968) expanded the gate-control theory by postulating multiple parallel central processing systems of noxious stimuli coming from the peripheral nervous system. According to this proposal, after the noxious stimuli are modulated in the gate in the spinal cord, they are projected through various pathways to two different brain areas to be centrally processed. One of the systems is phylogenetically older: the reticular formation, limbic system, and hypothalamus. In humans this system heavily interacts with the prefrontal cortex. Melzack and Casey called this stream the motivational-affective system. Indeed, the limbic system had long been known to be responsible essentially for emotional and motivational processes. They called the other the sensory-discriminative system, which involved the ventrobasal thalamic nuclei at which the noxious stimuli arrive through the ascending neospinothalamic tract and

go directly to the somatosensory cortex, the basic sensory component of the system. These two systems were also monitored and controlled by what Melzack and Wall had called "a central control trigger" that had usually already been aroused by the signals carried through the aforementioned fast conducting A-fibers that branch out before entering the gray matter in the dorsal horn. The location of this system was generally thought to be in the frontal cortex. The behavioral output in the broadest sense was supposed to be a varying function of these three systems. The functional organization of the underlying structures proposed by the theory can be seen in broad outlines in figure 1.5.

Melzack and Casey's speculations opened up a whole new chapter in modern pain research: more elaborate models with more detailed and precise anatomical mappings have emerged. The Melzack–Casey model was speculative and lacked detailed functional and anatomical specifications. However, even so, as revealed by later scientific research it was on the right track by postulating functionally distinct central systems for what appeared to be phenomenologically distinguishable and dissociable components of pain experience.

Let us briefly look at the current evidence. There are several ascending pathways that carry nociceptive signals to brain structures. Almost all of these (second-order) neurons, after synapsing with the primary afferents in the dorsal horn, cross the anterior white commissure and climb in the anterolateral quadrant (ALQ) of the spinal

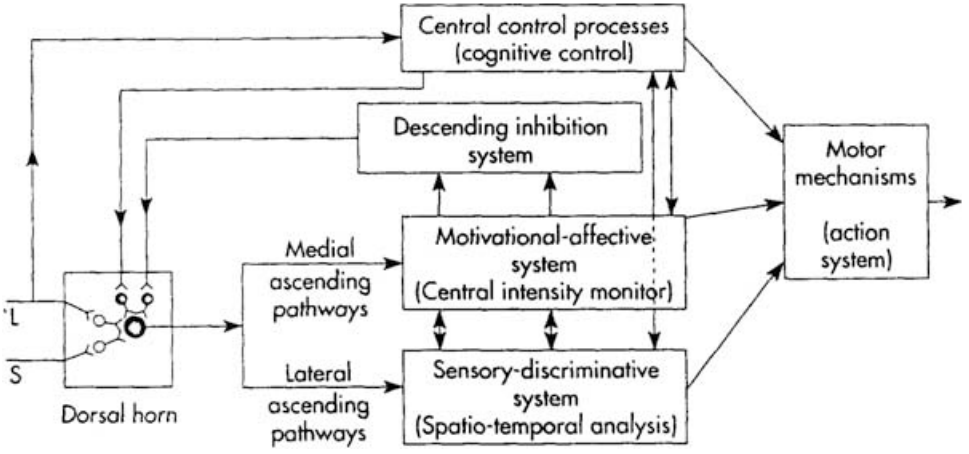

Figure 1.5

This is a modified version (Melzack and Wall 1983) of a diagram that first appeared in Melzack and Casey 1968. It also shows part of the original gate–control mechanism in the dorsal horn (Melzack and Wall 1965).

cord. Three major nociceptive tracts play a particularly important role: the spinothalamic tract (STT), the spinoreticular tract (SRT), and the spinomesencephalic tract (SMT). STT itself may be divided into two major tracts: the more laterally projecting neospinothalamic tract (nSTT), which terminates in the ventroposterolateral thalamic nucleus (VPL) where the nerves synapse with the third-order fibers that project mainly to the somatosensory areas I and II (SS1, SS2). The vast majority of nSTT neurons are wide-dynamic-range neurons (WDR), which originate in laminae I and II and have large myelinated axons. WDR neurons are fast conducting neurons that respond to a variety of peripheral stimuli including noxious stimuli, and encode their intensity very precisely. They have usually smaller receptive fields and seem to be somatotopically organized. The medially projecting part of the STT is usually called the paleospinothalamic tract (pSTT). The neurons of this tract have a variety of more diffuse central projections: some end in the medial and intralaminar thalamic nuclei (MIT), some diffusely project to different areas in the reticular formation (RT), pariaqueductal gray (PAG), and the hypothalamus (H), where they synapse with third-order neurons that project to the limbic forebrain structures (LFS)—such as the singular cortex (SC), anterior cingulate cortex (ACC), amygdala (A) and the orbitofrontal cortex—as well as to other areas of the brain, including weak diffuse projections to SS1 and SS2. The SRT and SMT, along with pSTT, are considered as the *medial* projection system or simply the medial system, whereas nSTT as the *lateral* system (see figure 1.6).

Like pSTT, SRT and SMT also diffusely project to areas in the reticular formation as well as to the parabrachial (PB) nucleus of the dorsolateral pons, to PAG, H, and MIT—although, as a rule, as they ascend higher in the brain stem, their projections become weaker and even more diffuse than those of pSTT. The neurons making up SRT and SMR comprise mostly the nociceptive neurons (NS) that are smaller in diameter and slower, and respond only to peripheral *nociceptive* stimuli. They are less precise and have larger receptive fields. (The trigeminal pathways that carry signals from facial structures have a similar medial and lateral organization—see figure 1.6.) There are other ascending systems. Some of them seem to be made up of several neurons synapsing each other as they climb up to areas in the brain stem. The existence of such diffuse pathways is probably one of the reasons why cutting major ascending pathways in the anterolateral quadrant seems not very effective in the removal of chronic pain.

Since Melzack and Casey (1968), it has usually been assumed in the scientific and especially in the medical community that the lateral and medial systems serve different functions.[37] In particular, the lateral pathways terminating in the somatosensory cortical areas (SS1, SS2) are assumed to serve the capacity of the pain system to distinguish between different sensory properties of noxious stimuli, such as bodily

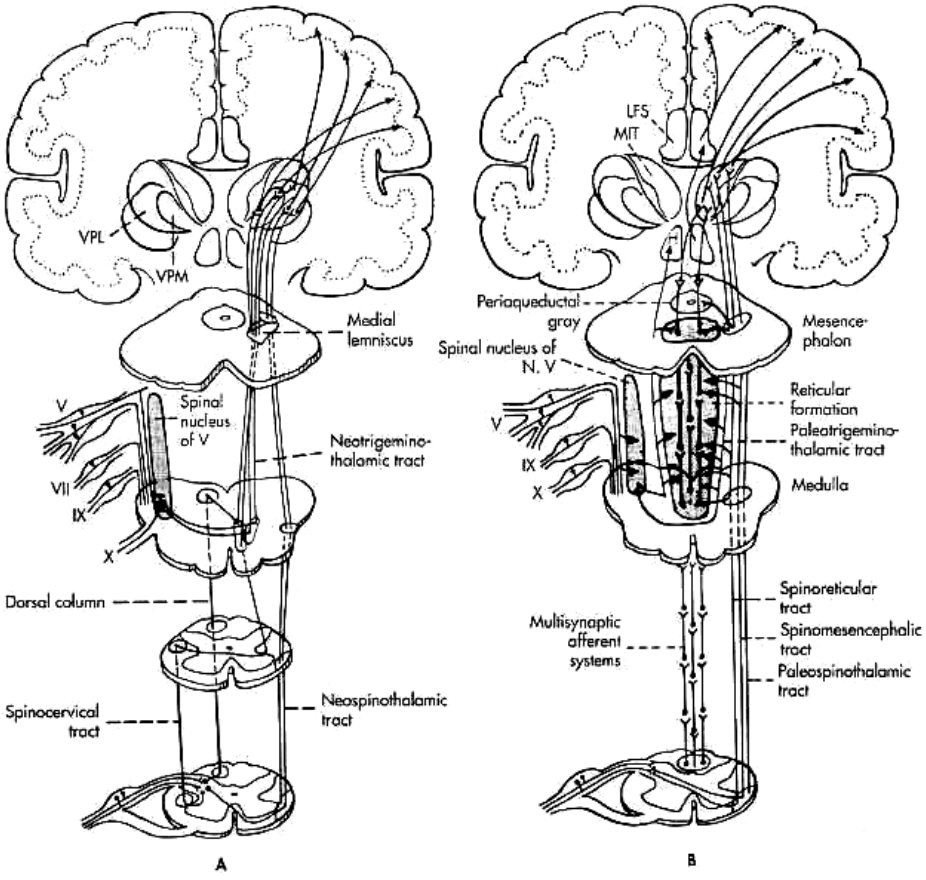

Figure 1.6

A: The lateral system, showing both nSTT and the neotrigeminothalamic tract which innervates facial structures. **B**: The medial system comprising pSTT, SRT, and SMT, as well as the paleotrigeminothalamic tract (from Bonica 1990).

location, intensity, and quality (thermal, incisive, traction, extension, etc.). In contrast, the medial pathways—due to the connections to insular and cingulate cortices and to limbic structures in general, which are known to play a crucial role in emotional behavior—are assumed to serve the capacity of pain to generate the appropriate affect-laden responses to nociception (such as unpleasantness, urgent desire for stimulus cessation, interruption of attention). In brief, it has been assumed that while, roughly, the sensory–discriminative aspects of pain are subserved by the lateral system, the affective–emotional aspects are subserved by the medial system. Moreover, since Melzack and Casey (1968), these aspects have usually been thought to be processed in parallel (see figure 1.5 above). This was thought to be an advance over the specificity theory's relegation of unpleasantness to a mere serial mental reaction to pain sensations proper.[38]

There are no doubt important truths in the common wisdom incorporated in this picture. The medial system have important direct connections to many areas in the limbic–forebrain structures that are known to be directly involved in affective-motivational phenomena. They are also involved in the arousal and the regulation/adjustment of autonomic responses to incoming stimuli. The evidence for the role SS1 and SS2 play in the sensory-discriminative aspects of pain is decisive. Nevertheless, things seem to be more complicated than what this neat picture tells us. In particular, there is evidence that there are also serial processes in the production of pain affect. The nociceptive signals reaching SS1 and SS2 seem to proceed through a cortico-limbic pathway to the posterior parietal cortex (PPC) which are then integrated with and analyzed in light of information coming from other sensory systems such as visual and auditory streams. Damage to this area produces profound defects in learning the affective significance of the stimuli being presented to monkeys and humans.[39] The integrated output is then sent to insular cortex where this serial stream converges with the stream coming from the medial pathways. The processing proceeds to the anterior cingulate cortex (ACC), which seems to regulate attention among other things. Among the most robust results in pain brain-imaging studies is the fact that ACC reliably lights up in correlation with the intensity of the unpleasantness of pain.[40] ACC has strong connections to sensorimotor areas and the prefrontal cortex, which is thought to be involved in setting response priorities, planning and action execution. Interestingly, part of the stream coming from ACC-FC feeds back to IC and to the amygdala, which receive direct input from the medial pathways (see figure 1.7).[41]

To summarize, there is considerable evidence that the affective-motivational aspects of pain are processed both in series with its sensory-discriminative aspects and in parallel. On the basis of our present knowledge of pain mechanisms and the pathways feeding to them we can give plausible explanations of various pain disassociation

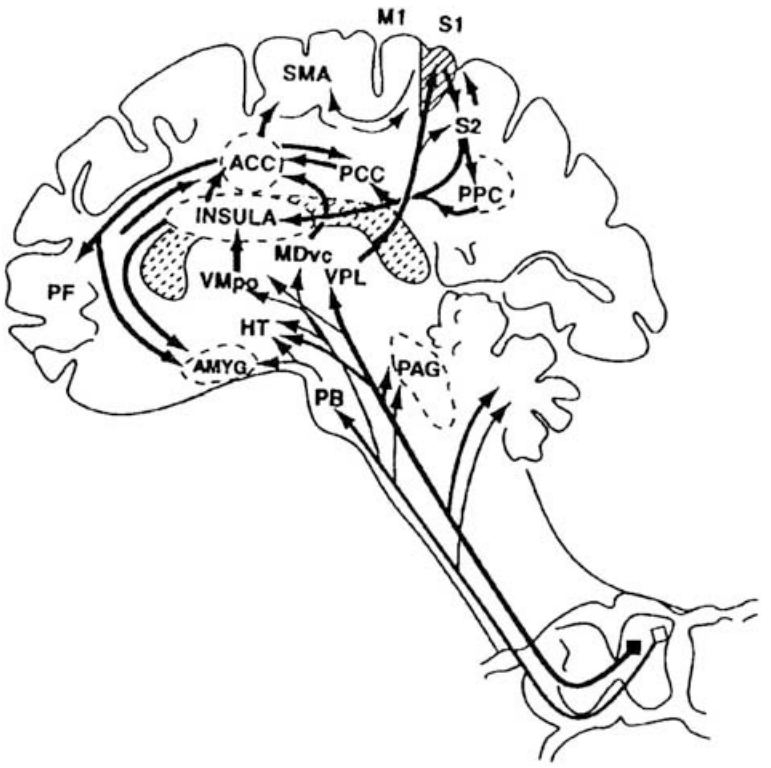

Figure 1.7
Outlines of ascending pathways, subcortical and cortical structures involved in processing pain affect both in series with and parallel to sensory–discriminative processes in pain. VMpo, ventromedial part of the posterior nuclear complex; MDvc, ventrocaudal part of the medial dorsal nucleus; PCC, posterior cingulate cortex; HT, hypothalamus; PPC, posterior parietal cortex; SMA, supplementary motor area; AMYG, amygdala (adapted from Price 2000).

effects. Although they implicate different structures or different stages in the pain processing, the essential and invariant point in all these explanations is that there are functionally and anatomically different—although overlapping—underlying brain mechanisms and these mechanisms can therefore be selectively impaired in ways characteristics to disassociation effects.

5.2 Prospects for the Philosophical Perceptual/Representational Approaches to Pain

Now that we have the general outlines of a story of what empirical and conceptual forces have been shaping the science of pain, we may ask if the recent trends in pain

science are any indication that the naturalistic trends that have been shaping the philosophical theories of pain in the last forty years or so have been on the wrong track. As we have seen, one of the main motivations behind the perceptual/representational views of pain in philosophy is the belief (or hope) that perception as a species of mental representation playing a certain informational/functional role within the mental and behavioral economy of organisms can be accounted for entirely in physicalistic terms. Of course, this is a controversial claim. There are many who think that perception involving as it does conscious phenomenal experience cannot be a purely physical phenomenon. They think that there are explanatory as well as metaphysical gaps between conscious and physical phenomena that cannot be bridged.[42] However, this much can probably be agreed upon generally: it is a perfectly plausible theoretical strategy to pursue an understanding of pain and other intransitive bodily sensations in perceptual/representational terms, because this strategy, if it works, minimizes the diversity of mental phenomena, and thus potentially offers the prospects of a more unified theory of mind, and if this theory turns out to be in harmony with the rest of our sciences and their fundamental metaphysical and methodological assumptions, so much the better. Indeed, it was the plausibility of this strategy and the belief that we will eventually succeed in understanding perception in purely naturalistic terms that have prompted many philosophers to advance perceptual/representational theories of pain. Many in fact believe that philosophy has made significant progress in the second half of the last century in developing the conceptual tools for a better and more naturalistic understanding of perception and the mind in general—for example, the notion of a mental representation and its (broadly) computational processing.

But does the scientific trend toward understanding pain as a subjective experience less like a perception and more like an emotion with quite a variable link to injurious stimuli undermine the philosophical project? There is no simple answer. We may say, "yes it does," if we take the perceptual/representational theories as making the strong claim that pain is strictly nothing but a perception just like other standard perceptions. We may say, "no it doesn't" if we take their claim in a weaker sense to the effect that pain *involves* perception, indeed involves perception in the very same sense and manner that other sensory modalities involve genuine perception—it is just that there is so much more going on when we are in pain. Nothing in the scientific understanding of pain and its underlying mechanisms seems to show that pain involves no perception at all—genuine perception specific to pain processing. On the contrary, as we have seen, there are physiologically specialized systems that process nociceptive stimuli from the moment they effect peripheral receptors to the central processing of these signals in the spinal cord and the brain. Pain processing may not involve sense

organs (e.g., the eyes, ears, nose, and the tongue) in the traditional sense of involving *physical (bodily) structures* that are designed to channel the appropriate energy forms to peripheral nerve endings for their transduction. But sense-organs in this sense are not necessary for genuine perception. What is necessary is that there be specific energy forms that are transduced and transmitted by specialized nerve fibers and their end-organs (dendrites), and are processed selectively by specialized central mechanisms. This is what happens in *all* classical five sense modalities, including touch that doesn't involve sense organs in the classical sense. Pain may be classified as a submodality of touch.

The modern representationalist theories seem to be making the stronger claim, however. Recall that they are in fact application of a more general naturalism about qualia to the specific case of pain. We have already seen some of the major difficulties facing these theories. What has recently happened in the sciences of pain, as we have just briefly outlined, seems to confirm the seriousness of these difficulties. The robust affective-motivational aspect of pain is less amenable to a representationalist treatment. But there is a physicalistic and very natural alternative: it is plausible to claim that this aspect of pain can be accounted for in a *psychofunctionalist* way. According to this proposal, even though the sensory-discriminative aspect of pain can perhaps be handled representationally,[43] the affective aspect reduces to the way in which the sensory-discriminative information is processed, not for analysis to extract information about the proximal or distal properties of the stimuli, but rather for its significance for the effector or motor systems, to set motivational parameters for action on the basis of stimuli's informational content.[44] There is in fact strong supporting evidence for such a thesis in the evolutionary stories of different organisms at different developmental hierarchies. The neuroscientific evidence about the affective brain seems also to support this idea in general.[45] Such a proposal should not be surprising, after all psychofunctionalism in philosophy as a reductionist proposal has always found its natural home in drive states that are intrinsically strong motivators. There is, then, little wonder why philosophers of mind have typically used the example of pain in the discussion of behaviorist or functionalist proposals about the metaphysics of mind in general.

This is a view that treats pain as both a representational and a psychofunctional state. Such a view still needs to provide a good answer to the main difficulty that we have seen afflicts all perceptual/representationalist views. Why is there an asymmetry in concept application, or in the focus of conceptual categorization? Pointing out that pain has a deeply pronounced negative affect is not entirely adequate even when we have an adequate account of what this affect consists in. We also need a new account of introspection; for if pain affect doesn't consist in representing a certain condition

but is rather a psychofunctional affair, then its introspection cannot avail itself to the use of a concept that applies to what this affect represents as is required by pure qualia representationalism—this is probably why pure representationalists usually tend to shy away from psychofunctionalism (how do we introspect a state or an aspect of a state whose nature is psychofunctional?).

These are the major questions that an adequate perceptual account of pain ought to give adequate answers to. Thus, despite significant advances in our philosophical and scientific understanding of pain in the last forty years or so, there is still a lot of work to be done to develop a fully satisfactory account of pain.[46]

Notes

1. It is natural to see perception as a process that involves categorization and to that extent as a process that is itself (at least in part) conceptual. This is consistent with the claim that perception starts with raw sensations. Sometimes, "perception" is used to refer to raw sensations. The essential and uncontroversial point, however, is that perception ends up with (perhaps modality specific) conceptual categorization when the information in the perceptual experience is picked up for use by the cognitive belief forming mechanisms—whether or not this categorization is part of the perceptual process itself.

2. In what follows, concepts will be denoted by capitalized words that name them. So, for instance, "RED" denotes the concept of red, which in turn expresses the property of being red. In other words, RED expresses the property of being red, or *redness* in short (similarly with other concepts and properties). Even though I assume for convenience a representationalist framework for concepts according to which concepts are mental representations realized in the brain (which is the psychologist's preferred reading), nothing very important hangs on this: the reader may substitute his or her own preferred interpretation of how concepts are to be understood. For instance, concepts may be merely certain sorts of mental or behavioral capacities that are functionally characterized.

3. But see Hill, this volume. Hill thinks that the possession conditions for the concept of pain and its reference come apart—so that our ordinary concept of pain is incoherent.

4. D'Amico (this volume) takes the epistemic asymmetry (he uses "unrevisability" rather than "incorrigibility") to show that our mental (introspective) discourse and ordinary perceptual discourse are governed by fundamentally different conceptual schemes. He then argues that this shows these cannot be happily juxtaposed in the way required by the methodology proposed by Price and Aydede (this volume) for the study of pain. Aydede and Price (this volume) deny that there is such a radical epistemic asymmetry *in kind*.

5. Indeed even those who have been critical of this definition consider it to be an important advance over a conception of pain that the note, appended to the main definition, warns against. For critical discussion see Melzack and Wall 1988, Price 1988, 1999, Fields 1999, Hardcastle 1999, and Aydede and Güzeldere 2002.

6. The term 'intransitive' is from Armstrong (1962, 1968). Armstrong contrasts these with "transitive" bodily sensations such as feeling the temperature or smoothness of an object, where the experience has a straightforward nonmental perceptual object. See the preface of this volume.

7. Broad (1959) defends one of the most sophisticated versions of a sense-datum theory. Interestingly, however, pains and aches, according to Broad, are less amenable to an act–object analysis. He writes: "It is by no means obvious that a sensation of headache involves an act of sensing and a 'headachy' object; on the contrary, it seems on the whole more plausible to describe the whole experience as a 'headachy' state of mind. In fact the distinction of act and object seems here to have vanished; and, as there is clearly *something* mental in feeling a headache, just as there is in sensing a red patch, it seems plausible to hold that a sensation of headache is an unanalyzable mental fact, within which no distinction of act and object can be found" (1959, pp. 254–255). Perhaps this is so with headaches and other aches that are spatiotemporally very diffuse. But it is not clear whether it is indeed more plausible to make the same claim about acute pains that are temporally and spatially well delineated, such as a sudden jabbing pain in the back of one's right hand or a pain caused by a pinprick in one's left thigh.

8. See Jackson 1977 for a defense of this line. Jackson 1977 is an unabashed and technically sophisticated defense of a sense-datum view in general and of pains in particular. See also Addis 1986 for a similar line. Jackson no longer defends a sense-datum theory: he has recently rejected antiphysicalism and accepted a physicalistic representationalist view similar to the one we will discuss below. See Jackson 1998, 2000.

9. See for instance Perkins 1983, and this volume. Perkins is not a sense-datum theorist, although he is an indirect realist. He dispenses with phenomenal objects in favor of phenomenal qualities that one's experience instantiates or somehow incorporates—they are part of one's consciousness. But he still takes the act–object model to be the proper analysis of sensory experience except that the act is now directed toward not a mental object but rather an instance of a quality. Perkins is the only indirect realist I know of who keenly advocates a perceptual view of pain that he claims requires physicalism.

10. See H. H. Price 1950, which seems to defend this sort of view. Price introduces the notion of a "sense-field" according to which "sense-data, though they have places in their own sense-fields, are *nowhere*" (p. 248). However, he does not treat pains as sense data on their own, but rather as "outstanding parts of a sense-datum (namely, of the total somatic one) which display a particularly striking sort of sensible qualities" (p. 232). For Price, when it comes to somatic sensations and feelings, there is only one sense datum with its own unique somatic sense field such that all bodily feelings and sensations are qualifications or modifications of it. For early classical discussions of sense-datum theories, see Moore 1903, 1939; Russell 1912.

11. See Lycan 1987a,b for useful discussion of this point.

12. See also Pitcher 1971.

13. The ensuing debate was quite lively. For criticisms of these early perceptual views of pain, see Vesey 1964a,b; Margolis 1976; Mayberry 1978, 1979; Everitt 1988; and Grahek 1991. Grice

(1962) had already argued that there is a fundamental distinction between bodily sensations and standard perception. See Armstrong 1964 and Pitcher 1978 for replies to some of these criticisms. Holborow 1969 and Pitcher 1969 are criticisms of another perceptual theorist's work, McKenzie (1968), who claims that "pain can be accepted as a sense in the way in which smell is a sense" (p. 189). For the most recent and radical incarnation of a perceptual view of pain, see Hill, this volume.

14. This is why Armstrong (1962, 1968) calls pains, itches, and tickles (among others) *intransitive* bodily sensations and distinguishes them from *transitive* bodily sensations like feeling the temperature of an object or the roughness or smoothness of objects' surfaces in contact with skin. The latter are transitive precisely because we attribute the sensible qualities to the objects themselves by the deployment of relevant concepts whose extensions are these objects in the first instance (or body parts if we feel, say, their temperature).

15. Compare the sense-datum analyses, which postulate a private internal particular that actually *instantiates* the qualities also attributed to the external public object that is the cause of the internal object's being sensed by the perceiver.

16. The proper formal semantics of adverbs is still a controversial topic in linguistics. But adverbialism is advanced primarily as an ontological thesis in the philosophy of perception, although the issues interact with each other. Also, strictly speaking, it might not be true that adverbialism about perceptual experiences may make do with only one individual, the perceiver. One prominent version of adverbialism is the event modification theory, which quantifies over primitive events and takes adverbs to modify these events—see Davidson 1980. On this view, there are two individuals: the perceiver and the event of her perceiving an object. But many defenders of this view might take this commitment to be innocuous when compared to a commitment of phenomenal objects like sense data. For early defenses of adverbialism, see Ducasse 1952 and Sellars 1975. Aune 1967 can be interpreted as a variant of adverbialism explicitly applied to pain. Chisholm 1957 defends a view (the "theory of appearing") that has close affinities with adverbialism. Kraut 1982, Lycan 1987a, and Tye 1984a are more recent and technically more sophisticated defenses of adverbialism in general. Tye (1984b) and Douglas (1998) defend adverbialism about pain specifically. The latter is an adverbialist reply to Langsam (1995), who attempts to give an explanation of why we think and talk about pains as mental objects. For powerful criticisms of adverbialism, see Jackson 1975, 1977, Robinson 1994, and Foster 2000.

17. Adverbialism of this sort can be effectively combined with intentionalism or representationalism about experience (Kraut 1982 is especially helpful for an understanding of the intimate connection between them). An adverbialist has to somehow characterize these ways or manners of perceiving/sensing for the purposes of distinguishing among them, and the typical way in which she does that is by appealing to the standard or canonical conditions under which those perceptual events are brought about (recall how direct realists want to handle visual hallucinations: one is having a visual experience that is like an experience that is normally brought about when one actually sees a real red apple on the table). Thus it may be possible and reasonable to argue that those canonical conditions are what the specific perceptual events or activities of the persons represent. For instance, it is plausible to claim that a specific perceptual

activity constitutes the perception of red (= the perceptual event representing the instantiation of red) because it is the kind of psychological event regularly (canonically) caused by red surfaces—indeed one might expect that the psychophysics of sensory modalities would detail these canonical or standard conditions in objective terms. (The development of Tye's position over the years from adverbialist direct realism into an information-theoretic representationalism follows this path.)

18. Now a direct realist may in fact go on to claim, if he wishes, that we do engage in some sort of internal perception of our experiences in introspection, but this seems compatible with his direct realism in that introspecting (= perception of experiences) is not required for perceiving the objective world. Two prominent direct realists, Armstrong (1968) and Lycan (1987a, 1996), hold this position—but see below.

19. Compare Armstrong (1962, p. 125) where he writes:

Now it may well be asked why, in this important field of perception [intransitive bodily sensations], ordinary discourse restricts itself to sense-impression statements, instead of making perceptual claims about what is actually going on in our body. Several reasons may be advanced. In the first place, we have seen that the [conative] reactions characteristically evoked by these bodily impressions are determined almost solely by the impression, whether or not it corresponds to physical reality. Since the reactions are an important part of our concept of almost all the intransitive bodily sensations, it is natural to talk about what feels to us to be the case, whether or not it is the case.

20. That is, to the extent to which introspecting is a perception-like activity. But even if it is not, we still need to do something equivalent—something like an information uptake—to become aware of our pain experiences.

21. Indeed, it is precisely the intransitivity of pain and the indirection that this implies that Perkins (1983, this volume) uses to make an initial intuitive case for indirect realism, which he later argues presents the basic argumentative framework for other senses as well.

22. For instance, when Pitcher first introduces the notion of unpleasantness as the reason why our concept of pain works the way it does, he writes in a parenthetical note: "(When I refer to the act, or state, of feeling pain as an *experience*, I do not, of course, mean that it is an exclusively mental happening or anything of the sort: I mean 'experience' in the sense that riding a bicycle or lying on a rug before a fire is an experience—that is, merely as something that we do or undergo)" (Pitcher 1970, pp. 379–380). Perhaps feeling pain is not indeed an exclusively mental happening. But it is certainly an episode of conscious experience in a much more robust sense than riding a bike is—as he himself seems forced to acknowledge later in the same paper.

23. The main bulk of the present introductory chapter was written in 2002, parts of which were intended as an entry for the *Stanford Encyclopedia of Philosophy*. For this reason it does not cover the later theoretical developments. Indeed, the essays by Tye and Hill in this volume can be seen as fresh and important contributions to the literature that continue the debate where my introductory essay stops. Instead of incorporating the new moves contained in Tye's and Hill's

chapters into the present exposition, I wanted to leave the latter as is so these new chapters could be better appreciated within the larger dialectic partly provided in this introduction. The reader is therefore encouraged to read Hill's and Tye's essays in this volume as fresh and prompt rebuttals of some the critical points made in this section. Dretske's new essay is primarily on the epistemology of pain and introspection in general, rather than a direct defense of representationalism about pain.

24. Lycan 1987a (pp. 60–61) contains a brief statement of a representationalist account of pain; however, Lycan does not claim that the affective aspects of pain can also be handled representationally. He seems to have in mind a mixed representationalist-cum-psychofunctionalist theory about pain and other bodily sensations. See below.

25. See Dretske 1981, Fodor 1987, and Aydede and Güzeldere 2005 for a strict informational psychosemantics (the latter contains an extended discussion of pain in the context of informational theory). See Dretske 1988, 1995 and Tye 1996 for a combination of informational and teleological psychosemantics. See Millikan 1984 and Papineau 1987 for teleological versions.

A naturalist functional role psychosemantics (a form of internalism) is not out of the question. See Carruthers 2000, (ch. 9) for a representationalist account of pain that comes close to this—what he calls a consumer's psychosemantics. Rey 1997 (ch. 11) contains an account of sensory experience according to which phenomenal properties are identified with narrow functional roles of sensory states, which roles are then identified with the narrow representational content of these sensations. See also White 1986 for a similar narrow functionalist account.

26. See also Block 1996, Peacocke 1983, and Searle 1983 for similar views. Shoemaker also seems to believe that many experiences like taste and smell (and a fortiori pain) do have a phenomenology that cannot be captured entirely by their representational contents—see his discussion about taste in his 1996 (pp. 102–104), which can be applied, *mutatis mutandis*, to pain without any difficulty.

27. Tye actually accepts this; see his 1996 (pp. 4–5).

28. From the text it is not clear what the concept is supposed to be applied to. Tye says that he applies it to the damage in his leg, but then he does this in introspection. Do we perceive or introspect our legs? Maybe both are involved, but we are not told how in the passage. (Tye's chapter and his replies to commentators in this volume address this question in more detail.)

29. This view of introspection has close affinities to what Dretske (1995) calls a *displaced perception* view of introspection. But Dretske's view is stronger than what is presented in the main text in requiring an inferential linkage between one's perceptual beliefs about the public object represented by one's perception and the introspective belief that this is what one's experience represents. But this stronger and to my mind implausible requirement is not forced upon a representationalist, although all qualia representationalists *are* committed to the claim that possessing the relevant concepts are necessary for introspective *knowledge* of one's experiences. See Aydede 2003 for a criticism of Dretske's view of introspection. Dretske, with his new essay in this volume, seems to have dropped his earlier view of how introspection works—instead he is actively probing the theoretical space for a more plausible view of introspection consistent with his externalist representationalism.

Also, even if introspection might begin with an internal monitoring device as Armstrong (1968) and Lycan (1995) envisage it, introspective *knowledge* of phenomenal qualities still needs the possession of those concepts that apply to what these qualities represent, according to externalist qualia representationalism.

30. See Aydede 2001 for an elaboration of this objection. (Again: see Tye's contributions to this volume.)

31. See Gustafson's essay in this volume for a proposal that seems to take this trend and extend it to its logical extreme: it is more fruitful to conceive pain experiences as essentially emotional rather than perceptual states.

32. See also the chapters by Polger and Sufka, Price and Aydede, and Allen et al., as well as the chapter by Panksepp in this volume for useful and accessible presentations of aspects of underlying pain mechanisms.

33. See Dallenbach 1939, Botterell et al. 1942, Bonica and Loeser 2001, and Melzack and Wall 1988 for more detailed historical accounts of the development of scientific pain theories. (Gustafson's essay in this volume also contains a brief history of conceptions of pain.)

34. See the first two chapters of Melzack and Wall 1988, which present in great detail a powerful and convincing case for the existence of a hugely variable link between pain and injury. Melzack and Wall were very self-conscious about what they needed to account for in developing their gate-control theory—they go over the history and philosophy of their own discipline in great detail and insight. Melzack and Wall 1962, 1965 are also very useful.

35. See Price 1999, 2000, 2002 for an illuminating discussion of such cases and underlying mechanisms. Price draws a distinction between immediate unpleasantness of a pain experience and what he calls pain's secondary affect, which consists of a conscious cognitive appraisal of the consequences of the pain and its cause, which involves various emotional reactions (e.g., worry, panic, anxiety, arousal, depression) that typically last longer than the onset of pain. He thinks that pain asymbolia involves cases where both the immediate unpleasantness and the secondary affect are absent, whereas in other cases, although immediate unpleasantness is present, the secondary affect is absent.

There is strong evidence that the disassociation between the sensory versus affective components of pain also goes in the other direction: in addition to cases where the intensity of the sensory component can be reduced without affecting the unpleasantness of the experience (Gracely et al. 1979), there is at least one well documented and studied case where the patient experiences something very unpleasant upon receiving nociceptive stimuli without being capable of identifying his experience as pain (Ploner et al. 1999). It is worth quoting from this study to illustrate the prima facie counterintuitive results, which provided strong support for the bidimensional nature of pain experience: "[At higher intensities of cutaneous laser stimulation] the patient spontaneously described a 'clearly unpleasant' intensity-dependent feeling emerging from an ill-localized area 'somewhere between fingertips and shoulder' that he wanted to avoid. The fully cooperative and eloquent patient was completely unable to further describe quality, localization, and intensity of the perceived stimulus. Suggestions from a given list containing 'warm,' 'hot,' 'cold,' 'touch,' 'burning,' 'pinprick-like,' 'slight pain,' 'moderate pain,' and 'intense

pain' were denied" (Ploner et al. 1999, p. 213). In personal communication, Price has indicated an important feature of the findings: the unpleasantness reported by the patient has arisen only when the laser stimulus intensity has reached 350 mJ, 150 mJ more than the normal pain threshold established for the normal right hand. As emphasized by Price, this seems to indicate that the disassociation of affect from sensation is not just a matter of a parallel system being shot down, rather it leaves room for a serial interpretation of the interaction between affect and sensation. Price 2002 contains a useful discussion of such cases.

36. See Sufka and Price 2002 for a generally positive reevaluation of gate-control theory after nearly forty years after the publication of Melzack and Wall 1965. See Jones 1992, Sandkühler 1996, and Fields and Basbaum 1999 for a thorough and up-to-date examination of endogenous pain modulation mechanisms. For more accessible general surveys of the modulatory and control systems, see Fields 1987, Melzack and Wall 1988, Price 1999, and Hardcastle 1999.

37. In fact, the idea of a dual afferent system goes back to Head and Rivers (1920). They postulated an "epicritic" system responsible for fine and precise tactile sensory discrimination and a "propopathic" system responsible for generating sensations in response to nociceptive stimulation.

38. It is interesting to note that Marshall (1892, 1894a,b), a philosopher and a psychologist, argued against the conception of negative affect being in series with pain sensations proper, which was a common assumption at the time. Marshall thought of the unpleasantness of pain sensation as a particular kind of negative tone surrounding a specialized sensory response to nociceptive stimuli; thus he conceived of it as a process parallel to pain sensations. In fact, he was arguing against the specificity theory by defending what was called the "affect theory of pain." Marshall generally conceived of (negative and positive) affect as a hedonic tone surrounding all kinds of sensations proper. Such a view seems to have been defended by some of the nineteenth-century introspectionists like E. B. Titchener who wrote: "The pain of a toothache is localized at a particular place, 'in the tooth'; but the unpleasantness of it suffuses the whole of present experience, is as wide as consciousness. The word 'pain' . . . often means the whole toothache experience." (The quotation is from Melzack [1961, p. 47], who does not specify the reference.) See also James 1895 and Duncker 1941 for similar views. Trigg 1970 contains one of the most sophisticated philosophical accounts of pain that is sensitive to these issues.

39. See Greenspan and Winfield 1992, Greenspan et al. 1999, Dong et al. 1996, and Dong et al. 1994. Also, for a fascinating survey of the evidence for the importance of the posterior parietal areas for immediate affect, which is thought to be implicated in patients with pain asymbolia, see Grahek 2001. Grahek, after going over various kinds of pain disassociation effects, concludes that the only cases where absolute disassociation occurs are some forms of pain asymbolia where extensive damage is found in either insular cortex or the posterior parietal areas, especially in area 7b.

40. See the influential studies conducted by Rainville and his colleagues (Rainville et al. 1997, Rainville et al. 1999). By using hypnosis, they were able to selectively influence ratings of pain unpleasantness and pain sensation intensity. They were able to show that unpleasantness can be

varied while sensory intensity was kept constant. But they couldn't demonstrate that the pain sensation can be varied without changing its unpleasantness. These results seem to show that pain affect is causally dependent on (and therefore in series with) the sensory processing of pain intensity. On the basis of these results, they propose a serial model of pain affect resulting from pain sensation processing.

41. Since his 1988, Price has been consistently advocating a serial processing of pain affect. In a series of recent articles (Price 2000, 2002) and in his recent book (Price 1999), he presented the underlying mechanisms and much of the evidence for serial processing of pain affect. He thinks that although affect in general is processed both in parallel and in series by the two major pathways, consciously felt affect results when the nociceptive stream coming from SS1 and SS2 (major sites at the end of the lateral pathway) reaches IC and ACC via PPC and PCC—see figure 1.7. I am much indebted to his work and his patient tutelage.

42. See Robinson 1982, Jackson 1982, 1986, and Chalmers 1996, among others. (The chapter by Polger and Sufka in this volume addresses this problem; they attempt to show that the explanatory gap said to exist between conscious experiences and brain processes can be closed, and they use the case of pain to show that.)

43. *Perhaps*, because the huge variability of the link between nociceptive stimuli and the pain experience can be taken as evidence that even this aspect may not be representational, or may not be *entirely* representational. A pure representationalist needs to argue for her case in the face of apparent scientific counterevidence.

44. See Clark's essay in this volume for an elegant and powerful development of this sort of proposal. However, he thinks that the (negative or positive) affect of experiences is not a quale. But it is not entirely clear whether by this he means to reject the view that the affective aspect of experiences is not part of their overall qualitative phenomenology. Aydede 2000 also contains a psychofunctionalist proposal with respect to pleasure states.

45. See particularly the work of Kent Berridge and his colleagues at the University of Michigan (Berridge and Pecina 1995; Berridge 1996; Berridge and Robinson 1998; Berridge 1999).

46. For a detailed attempt to give such an account answering what we have called above the "main difficulty" and incorporating an appropriate account of introspection, see Aydede and Güzeldere 2005. See also Lycan 1987a, 1996.

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