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Editorial

The definition of pain

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Summary - What we ordinarily call pain can arise either as a consequence of physical events or as a result of psychological processes. Both situations can be covered in one definition by treating pain as a word which applies only to subjective experience and not to nociception or to physiological processes. A definition of pain, framed in this fashion by the subcommittee on taxonomy of the International Association for the Study of Pain (IASP), was adopted by the IASP in 1979 and has been widely accepted since that date. Behavioural phenomena should not be confused with this definition. It implies a monistic view of the experience of pain and it is inappropriate to encumber it with concepts of "pain behaviour". At the same time dual or multiple causes of pain are recognized. Thus physical causes, psychological causes or both may produce the unitary experience.

pain / meaning / concept / definition

Early views

We can presume that most people think they know what they mean by pain. Physicians, however, have had far more trouble with the concept. The meaning and definition of pain have received considerable scrutiny and have been the subject of quite prolonged argument. The problem particularly arises with the issue of whether pain is a sensory phenomenon or an emotional one. Aristotle, who associated pain with sensation, observed "Where there is sensation, there is pleasure and pain", and apparently regarded pain as qualifying sensation. Like Plato he also classed pain with pleasure as a "passion of the soul", an expression which nowadays might be translated as "a state of feeling".

While Aristotle's views of pain were standard for more than a millennium, it is likely that most individuals distinguished between a sensation of discomfort in the body, which they called pain, and unhappiness or misery which was not necessarily associated with physical changes in the body. For example, St Thomas Aquinas distinguished between pain and pleasure which he attributed to external sensations, and joy and sorrow, which, although implying an object, seemed to spring from inward "apprehension" *ie* awareness or knowledge. Aquinas held that the senses were required for bodily pain, as for bodily pleasure, but that "operation" from within was necessary and to that he gave precedence. He made a fairly clear distinction between pain, as a bodily experience, and sorrow, which included both pain and grief. He also noted that pain or grief could be assuaged by pleasure, tears, sympathy, friends, contemplating truth, sleep and baths. In his combined approach he strikes a curiously modern note. However, the tendency to regard pain principally as an emotion, was also strong and Spinoza, for example, mentioned 3 emotions of which pain was one, and in this pain, dolour (or grief) and melancholy were included.

Although pain is clearly identified with physical changes, it has long been recognised that it is subject to emotional causes. One historic observation was made by Montaigne (1580), as follows:

> "Nous sentons plus un coup de rasoir du chirurgien que dix coups d'espee en la chaleur du combat. Les douleurs de l'enfantement par les medecins et par Dieu mesme estimees grandes et que nous passons avecques tant de ceremonies, il y a des nations entieres qui n'en font nul compte... aux souisses parmy nos gents de pied... trottant apres leurs maris vous leur veoyez aujourd'huy porter au col l'enfant qu'elles avoient hier au ventre."
>
> (We feel a cut from the surgeon's scalpel more

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that ten blows of the sword in the heat of battle. The pains of childbirth considered so great both by doctors and by God are held of no account amongst entire nations... the wives of our Swiss infantry trudging after their husbands may be seen today carrying on the shoulder the infant which was yesterday in the womb.)

The recognition of emotional influences on pain always made it harder for it to be classed as a sensation; and if it is not just a sensation there are problems in knowing whether it is something that is induced by external changes, or some mishap in the internal function of the body, or whether it is in another range of phenomena such as happiness and sadness.

The issue was much debated near the end of the 19th century by HR Marshall (1889) and CA Strong (1895). Their arguments depended upon the analysis of conscious experience although they were also well aware of the development of knowledge about sensory pathways. It was that knowledge which in the 20th century seemed to provide, paradoxically, the biggest stumbling block for an understanding of the concept of pain.

Relating pain to sensory physiology and to affect

Pain was effectively studied by physiologists whose bent was to treat it as a sensation which could be induced, and similarly, by physicians at large. Despite much success in analysing medical complaints and physical syndromes by the techniques of clinical history-taking, neurological examination and physiological investigation, pain could not be regarded as occurring independently of the emotional state of the individual. Although it was always felt that it was a word whose use we understood very well, it was difficult to define, either briefly or at length. The problem baffled many distinguished authors. Lewis (1942) wrote "reflection tells me that I am so far from being able to define pain, of which I here write, that the attempt could serve no useful purpose". This did not prevent him and others from treating it as a meaningful and expedient term. Nevertheless when Beecher (1959) also felt that he could not define pain and collected opinions from the literature, or by correspondence from other authors, another 7 distinguished investigators were noted who felt unable to define pain (Livingston, 1943; Medvei, 1949; Holmes, 1950; Kolb, 1954; Adrian, 1956; Bishop, 1956 (personal communication; *(At* Beecher, 1959) and Lhermitte, 1957). Bishop wrote to Beecher in response to his enquiry as follows:

"Pain is what the subject says hurts. You can't get behind that. It consists, however, of two phenomena. A: Pain as a subjective experience, reported as a sensation referred specifically to some part of the body and sufficiently unpleasant to be designated as painful by the subject. End definition A...

This pleasant sensation will of course vary with emotional state, anxiety, anticipation of disaster, etc, and is almost impossible to deal with quantitatively since it has such a large component of what is referred to as reaction to sensation. It may be due to activation of any modality of sense, and I suspect, to none. I know of people who can throw a sick headache, and so do you, as a protest, and I can't say they don't have one.

B: Pain as a physiological process, with a subjective evaluation in addition to perception, is **a** result of stimuli to sensory findings or pathways of two types of fiber; certain small myelinated fibers causing pricking pain on adequate stimulation and unmyelinated fibres causing burning pain. (Beecher here has a footnote in which the first sentence says "First and second pains have been separated by determining the conduction times of the two".) Both pass up the lateral columns of the cord after synapse in the substantia gelatinosa. End definition B...

If you ever get a good psychologist to tell you what pain is, please let me known. I haven't had any luck."

This suggests that the problem for Bishop lay in trying to recognise 2 types of intermingled events, one, something which started with damage to tissue or stimuli to the nervous system, and the other, something which arose in response to psychological influences and yet mimicked, or was identical with, the first. Note how Beecher identifies pain with conduction in different nerve pathways.

One of the easiest methods of solving a problem of definition is sometimes to see how the author of a dictionary tackles it. This does not always help because the author of the dictionary may have the same problems as the reader. However, he will tend to give the common uses of a word. The Oxford English Dictionary (1933) gives 6 principal substantive categories of meaning for the word pain. Two categories relate to taking trouble over something, and the remaining 4 are:

1) Suffering or loss inflicted for an offence.
2) A primary condition of sensation or consciousness, the opposite of pleasure; the sensation which one feels when hurt (in body or mind); suffering distress.
3) In specifically physical sense: (a) bodily suffer-

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ing, a distressing sensation as of soreness (usually in a particular part of the body; (b) the throes of childbirth, labour.
4) In a specifically psychical sense; mental suffering; trouble, grief, sorrow.

Several of these categories have more than one meaning, and the first is the one most closely related to the origin of the English word which in Latin is *Poena* (punishment) and similarly *Poine* in Greek, and *Peine* in French (although those words do not necessarily have the same meaning as pain in English). Two main themes come through from this dictionary definition. The first is a physical change, the second is an emotional state which may be metaphorical. However, the listing of sensation and pleasure and distress all in one category as in number 2 above, tends not to be helpful. On the other hand, when the use of the word is defined in the metaphorical sense as in the fourth meaning, this does enable us to separate what we normally call bodily pain from "mental pain" which is strictly metaphorical.

In the face of these problems perhaps the best way to try and understand the meaning of the word is to look at the context in which it is used. Hall (1953) applied this to physiological or psychological investigation by suggesting that what is meant by pain should be apparent in each investigation from the description of the experimental conditions and controls, the instructions, the results and the conclusions. This is precisely the situation one finds in experimental work in physiology and psychology. A definition reached in this way is operational. Most of the clinical observers who have discussed pain can be seen implicitly to have adopted a comparable approach. Commonly their discussion implies a disagreeable sensation and tissue damage; and if not, it implies a response by the patient with terms corresponding to those used when there is tissue damage.

One of the solutions which was offered previously, *eg* by Hardy *et al* (1952) was to say that pain consists of a compound of sensation and emotion. A sensory element and a "reaction to pain" were to be distinguished. Although he criticised Hardy and co-workers, Beecher (1959) believed that it was possible to speak of pain as having both a primary sensory component and a processing or reaction component. In my view these approaches are not satisfactory because they tend to confuse the mechanism with the phenomenon. Subjective discrimination of sensation and feeling in relation to pain has never been achieved. In fact, when the attempt is made to distinguish phenomenologically between the sensory contribution and the emotional contribution, it often seems that the author is trying to mix physiological concepts with psychological ones.

When writers attempt to think of pain as a physical lesion which will always cause a minimum sensation they quickly get into trouble. A statement by HG Wolff (1943) was severely criticised by Szasz (1957) for this reason. Wolff was commenting on a case reported by Goodhart and Savitsky (1933) of a psychotic post-encephalitic girl who blinded herself by avulsing each eyeball in turn. She denied discomfort or pain. Wolff commented that this was an instance of an "individual's lack of reaction to what must have been a very painful experience... frightfully painful wound". Szasz pointed out that this comment by Wolff is based upon the idea of the patient's "sensation of pain" being separable from his "reaction to pain" and that it constitutes a maoeuvre whereby the patient's experience is, in fact, denied. We do not know whether this particular patient had pain or not, and she might not have had any. A similar error occurs when Jaspers (1963) writes "Severe pains need not be felt". This is an error in logic due to confusing the stimulus with the experience.

Two basic phenomena

Physicians come to recognize, some more or less willingly, that all pain is something on which we take the subject's report. It varies, both with the physical state of the individual, and the state of mind of the subject. Pain may be absent despite very intensive trauma and this finding has been particularly prominent in battle casualties, and at other times, when it has been demonstrated that gross wounds, including some affecting large sensory nerves, may give little or no pain if the subject is sufficiently distracted by his situation, or if other comparable psychological factors intervene. However, some of this evidence may not be as reliable as once thought. The famous Anzio investigations by Beecher, in which soldiers were compared with civilians, compared wounds of comparable size but not of comparable aetiology. Much acute trauma is not immediately painful (Melzack *et al*, 1982). Penetrating and gunshot wounds may be very different in their physiological effects from wounds caused by the surgeon who steadily cuts and clips and ties, and cuts and ties again. Nevertheless, it is important to recognize that pain may seemingly be abolished by the emotional state and may also appear because of an emotional state when there is no physical lesion. Behan (1914) reviewed a ser-

ies of authors from Cicero to Wundt. Although he concluded that pain could not be strictly defined, he noted that the 2 ideas of a disagreeable sensation and a physical disturbance were both commonly found.

The present writer (Merskey, 1965) described terms used by psychiatric patients with no evident lesion to describe chronic pain. They included the following: throbbing, aching, burning, building up, sore, numb, radiating, bruised, like toothache, stabbing, bursting, cramps, pressing, heavy, pulling, dragging, or "nayging" (a Sheffield expression interpreted as "like toothache" and often spelt nagging), needles (but not pins and needles), as if it clutches, prodding, tightening and heavy, knotting, cutting, like electricity, draining, tantalising, jumping, crunching, dithering, striking, like a knife, wasting, digging or due to blows.

It is noteworthy that almost all these terms are indicative of a change in the body. Some of them also indicate strong feeling about it, *eg* tantalizing. Subsequent work with the McGill Pain Questionnaire, both in the original English version (Melzack, 1975) and in versions in a number of other languages, seems to have maintained that the words used which will describe pain are either sensory or affective and perhaps evaluative. This is the case irrespective of the cause of the pain. Very few authors have succeeded in making much distinction between the descriptions of pain according to whether or not the pain is believed to be of physical or psychological origin, although Leavitt and Garron (1979) have produced evidence of some differences. Those distinctions that can be made however, are submerged by the overlap which occurs in the description of pain from different causes.

Devine and Merskey (1965) also showed that when patients with physical lesions were compared with patients without physical lesions there was little difference. Patients whose pain was "organic" and those whose pain was "psychogenic" and who were seen in the same clinic, showed no difference in the type of description of pain.

A phenomenological and operational definition

It appeared that the problem of defining pain might be resolved by an operational definition. The operational definition should take into account the fact that individuals tended to associate pain with damage to the body, and that they tended to describe it in those terms, whether or not a lesion was present. The following definition of pain was then framed:

"An unpleasant experience which we primarily associate with tissue damage, or describe in terms of such damage, or both". (Merskey, 1964). This definition was offered more widely later (Merskey and.Spear, 1967a,b). It was important in this definition that we accepted as pain those experiences which the patient, without evidence of tissue damage, related to damage and held to be unpleasant. This still allowed for the relationship of pain to the experience of bodily damage. Of course we often speak of painful experiences referred to the body in which tissue damage is not directly presumed. We may even say of something which we call painful "It's just a headache" but this usually implies that there is some internal disorder, even if only a temporary one. The second important comment about the definition is that the experience is unpleasant.

It is important to emphasize the significance of the words "primarily associate". The idea they encapsulate is that we learn about pain from experience and we learn about it from those experiences which ordinarily involve trauma. A child falls down and damages his knee, and his mother says "Does it hurt? Do you have a pain? Let Mummy kiss the pain better". Pain becomes a word which fits those types of physical experience. Whether or not there is a physical cause, all such experiences which have the same subjective character are called pain. Thus individuals who talk of pain are not talking ultimately about the aetiology of their condition, although that is presumed to be implied in most instances, but about that type of experience which they associate with physical damage. The special trick in this definition is that it takes the user away from preoccupation with noxious stimulation and instead gives him a psychological concept with which to operate. This does not mean that noxious stimulation and the mechanisms of the nervous system are not important, but it separates them from the phenomenological condition, the experience, which is what we mean by pain in ordinary speech.

The definition of pain is in a sense no more than a semantic trick. It has taken away the problem of trying to explain how noxious stimulation produces pain. In its place it states that we will treat as pain those experiences which resemble learned knowledge about what we call pain.

To make this more vivid, consider the following illustration. An individual who has pain from gout does not say, "I have a gouty calculus 0.25 cubic centimetres in the terminal interphalangeal joint of my right hallux magnus. It is giving rise to impulses in fine myelinated and unmyelinated fibres which

travel at 1 metre per second and depolarise nerve terminals ending on the second order afferent neuron in the dorsal horn of the spinal cord, from whence the impulses are conducted through the spinothalamic tracts to relay stations in the midbrain and so on to the thalamus". He says, "I have a pain in my big toe and it hurts, and it hurts a great deal more when somebody walks heavily or bangs the furniture near me". As with all other pains he describes his sensation and not the mechanism. The physician who is intensely interested in the mechanism is in difficulty because he wants to identify the mechanism with the pain and this is logically illegitimate because he tries to treat the mechanism as the experience.

The IASP definition of pain

In 1979 the International Association for the Study of Pain published the recommendations of its Subcommittee on Taxonomy with regard to definitions of pain terms (IASP, 1979). The following definition of pain was adopted:

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

The following note was appended.

> "Pain is always subjective. Each individual learns the application of the word through experiences related to injury in early life. Biologists recognize that those stimuli which cause pain are liable to damage tissue. Accordingly, pain is that experience which we associate with actual or potential tissue damage. It is unquestionably a sensation in a part or parts of the body, but it is also always unpleasant and therefore also an emotional experience. Experiences which resemble pain, *eg*, pricking, but are not unpleasant should not be called pain. Unpleasant abnormal experiences (dysaesthesiae) 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 pathophysiological cause; usually this happens for psychological reasons. There is usually 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."

I was chairman of the subcommittee. My colleagues accepted the substance of my original definition of pain but wanted to add some indications of the importance of both the sensory and emotional aspects of pain. I had no objection to that, except that it is ordinarily better to limit a definition to the minimum length necessary to describe the essentials of a term. The present definition slightly expands on the minimum needed but remains accurate. It has achieved an encouraging degree of acceptance, although there are also occasional failures to understand what it is about.

The most common failure of understanding is the attempt to say, "This is good as far as it goes but it does not go far enough. It does not include behaviour". It was never meant to include behaviour. Indeed, as a good definition it cannot include behaviour. Pain is the term which has always been used in a specific way to indicate the subjective experience of the individual. There are many important forms of behaviour which are associated with pain and which deserve to be studied and treated. However, any attempt to say that the definition of pain requires the inclusion of behaviour is a mistake. I cannot help feeling that it is sometimes motivated by a wish to be able to treat something other than that which the patient is describing, in other words, not to have to accept the patient's word that he has pain, but rather to tell him that he will be taught to act differently.

Two other considerations deserve to be mentioned in regard to the definition. It might have been worthwhile to say "The characteristic unpleasant experience..." which would have specified that it was that special type of unpleasant experience which we recognize with pain. There are other unpleasant experiences which we know are not pain, for example nausea or vertigo or a general malaise. These are clearly different from pain so that the failure to include the word characteristic does not seem to have led to any misunderstanding.

There has also been little if any problem over questions concerning masochism. It has been natural to think that pain in some people who seem to seek it out may be both pleasant and unpleasant. Gardiner (1964) argues that it could be unreasonable to reject on *a priori* grounds, the contention of a masochist that he sometimes "enjoys" pain. From my own reading of the literature and from occasional examinations of masochistic patients it is not evident that the experience which a masochist

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calls "pain" is any different in its quality of unpleasantness from what is normally called pain. The illustrations which Krafft-Ebing (1965) offers of masochism suggest that affected individuals are much more interested in humiliation and subservience than in physical trauma to themselves. In the cases where physical trauma is accepted we can suppose that it is an unpleasant experience which the individual accepts to achieve other aims, including certain types of pleasure and sexual satisfaction. This is in agreement with the view of Havelock Ellis (1898). The unpleasant experience could therefore precede or exist simultaneously with a pleasant one as a condition of obtaining the latter.

Some authors have wanted to talk about "non-painful pain" (Bishop, 1943, 1946) with respect to sensations arising from the weak stimulation of those sensory nerve endings which on stronger stimulation give rise to pain. Keele (1962) suggested the term "metaesthesia" to describe similar non-painful sensations produced in chemical blister experiments. Hare (1964) argued that there may be a phenomenologically distinct sensation such as burning pain or stinging pain, and that there could be a word for such types of sensation which did not imply dislike. In other words, they would be sensations similar to pain but not unpleasant. Spear and I (Merskey and Spear, 1967a) thought that the opinions of Hare and Bishop were not unreasonable, but that if such experiences exist which are not unpleasant it would be more helpful not to regard them as pain. They may be related physiologically to other experiences, but are probably best viewed as neutral affectively, and distinct sensorily, from pain, even though attributable to noxious stimulation. However, Keele's term metaesthesia could be valuable as describing those sorts of sensation which otherwise resemble pain but are not unpleasant. If we do not accept this we may find ourselves in the logical trap of talking about "pains" which are not pains, and this is but one step away from the error of Jaspers (1963).

Monism and dualism

The view of the experience of pain which has been offered here is monistic. Yet pain has many causes and many influences. It may be initiated most often by physical stimuli, or potentially recognisable changes in the operation of the peripheral or central nervous systems. Those physical events may be affected by analgesic medication or sometimes by psychotropic medication which has analgesic actions. Placebos may likewise relieve pain of organic origin and states of emotion can influence it, as discussed earlier. At the same time pain can arise apparently, even if not very frequently, from psychological causes alone. This may occur with depression or as hysterical symptoms, or through the intermediary of muscle contraction in response to anxiety. It may occur sometimes albeit rarely, as an hallucination in schizophrenia or depressive illness (Watson *et al*, 1981). On looking at the interaction of psychological and physical causes some pains of psychological origin may be influenced by placebos and also by psychotropic medication which tends to ease the psychological condition. Several authors have suggested in consequence that pain is a complex phenomenon. In fact, I would argue that although it may have quite a few terms to describe it, it is on the whole, a relatively simple phenomenon subjectively for the most part, although at times very, very severely unpleasant. How can this be reconciled after all with a monistic view of pain? I suggest that we should see the experience as monistic but the aetiology as multiple. It is widely accepted nowadays that the phenomenon of pain should be regarded as unitary whatever its causes, whether they are principally or wholly organic, or whether they are principally or wholly psychological. Thus we reach the position that we have a monistic view of the experience and a dualistic, or even multiplistic view of the origins of pain.

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