

Science, pain and destruction*

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1 Physical pain

What we call pain happens when the brain is receiving many more signals from somewhere than it is normally used to. Even some microscopic organisms are able to sense changes in their environments and take advantage of or seek to avoid these changes. More complex organisms have dedicated sensory and immune systems which report on and sometimes respond to changes outside and inside the organism.

Whether these organisms experience pain in the same way as human beings, many organisms share with human beings a nervous system which reports changes in the environment and in some parts of the body and a biochemical system which responds to these changes by sending out chemical messages. We feel pain and pleasure when the brain is receiving many more signals from somewhere than it is normally used to.

If the brain interprets these signals as an attack on us in some way, it orders the production of chemicals which make us more alert so that we can change or leave the situation which is creating the pain or suppress the action of the nervous system so that we no longer feel so much pain. Most pain-killers do the same job; they don't deal with the problem; they simply reduce the number of messages the brain receives and so lull the brain into a false sense of security about what it needs to do.

In extreme situations the brain changes the ways some of our systems work so that we no longer have to deal with the pain; for example, hypothermia — lowering the temperature of the body — allows the body to continue working without using as much energy and, as long as it is not too prolonged, we can survive it. The British had far fewer casualties in the Falklands War than they expected because wounded soldiers' brains allowed them to remain in hypothermia until they could be treated. Hallucinations can prevent us dealing with the reality of an extremely stressful situation until we are ready for it.

The experience of pain is thus a gift of God that prompts us to do something about a situation which (we think) should not be happening to us or, in good situations, we cannot believe is happening to us. At its most simple level, it prompts us to react instinctively, as when we touch a pin or a very hot object, but there are many complexities to it. It also reports through tingling sensations when damaged nerves are being reconnected and it can enable us to learn how to handle situations.

The body uses a 'total loss' system for the chemical messages so that, once the chemicals have had their effect, they are expelled from the body along with other bodily fluids like sweat or tears. We can accelerate this process by taking enough exercise to raise a sweat, assuming

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we have not already been physically debilitated by what is causing the pain, or by crying but, if we think that things are worse than they are, we may not be able to get rid of the chemicals as fast as our brains are producing them — that is when we continue to feel we are under stress beyond the immediate experience of the pain. Of course, if we remain in a continually bad situation through no fault of our own, we may never be able to get rid of the chemicals fast enough and we will remain under continuing stress. But, if we can get out of the bad situation or we can find a way of thinking about it positively, we can help to reduce the production of the chemicals, even though we cannot stop it, and thus the severity of the pain and stress we may be feeling.

In other words, how we experience pain doesn't just depend on the cause or the severity of the pain itself; it depends on how we think about it and how much control we have over the situation. The psychiatrist, Bruno Bettelheim (1943), commented that the worst thing about concentration camp was not the deprivation or the cruelty but the uncertainty about what was to happen next. Like all God's gifts we and others can use or misuse the gift of pain which is intended to help us by making things worse for ourselves, for example, by ignoring pain — disastrous if the pain is warning us that we have a heart or other condition — by under- or over-estimating the seriousness of the problems we face or by imposing it on others in our control. Sadly, human beings have a tendency to impose pain on others if they think they are under an instruction to do so (Milgram, 1963) or are given a position of authority over others (Haney et al., 1973). So all those who find themselves in positions of authority or control over others have to be constantly on their guard about this tendency.

2 Emotional pain

Emotional pain is really an extension of physical pain in the sense that it is normally triggered by events in ourselves or our environment which cause us to think differently about ourselves, our relationships or our situations in general. It can happen:

- if we let ourselves down by doing or failing to do something we had promised or intended not to do or to do
- if someone whom we rely on or trust fails to do what we expect in a situation
- if a group in our environment respond to us in a way which we had not expected.

In other words, emotional pain is almost always related to how we see ourselves or others or how others see us. Depending on how serious the pain, we may go through 'denial' — actually quite useful, for example, after a bereavement, because it gives us time to take practical measures to deal with the situation which is causing the pain — depression, anger or bargaining before reaching acceptance of the reality of what has happened and beginning to deal with it emotionally.¹

Those who have high self-esteem or those who are given high self-esteem through the care and support of others are likely to recover from the emotional pain more quickly; interestingly, in these circumstances people who have experienced the most severe harm, whether physical or emotional, recover from it much faster than people who have only experienced moderate harm; for example, it took around five years in the case of adopted children who had previously been

¹The same processes apply to emotional pleasure — people who are blessed by God often go through a similar process before they fully accept the reality of the blessings God has given them.

neglected but not seriously abused (Kadushin, 1970), a lot longer than the twins in Koluchová's study who had been very seriously abused (Koluchová, 1976). It appears that God has made our bodies and minds capable of working overtime to repair the most serious damage but allowed less serious damage to be put right over a longer period.

Those who have low self-esteem and whose situations do not change for the better may never recover from the emotional pain even if there had been the appearance of some recovery (Bronfenbrenner, 1974a,b). In general victims who make the most fuss about their victim-hood are not those who suffered most at the time of the harm but those who received inadequate recognition and support in the aftermath of it. To put it another way, if we know someone who has suffered harm and fail in our responsibility to 'love our neighbour as ourselves,' to give them the care and support in the aftermath of an experience of harm which we would expect to receive in the same situation, we cannot blame God for the fact that they have not recovered as we would have hoped. God gave us the gifts to help those who have suffered pain and we have to use them in order to fulfil God's purposes.

Our problem may be that people with low self-esteem can also be reluctant to disclose the harm they have suffered because they think they deserved it; so they never get any help to deal with it. It is important that we love people in ways that raise their self-esteem so that they have the confidence to talk about and receive help and support for the harm they have suffered.

3 Pain as a part of learning

Human beings are very sensitive to changes in their environment and the systems which help us to detect harm to ourselves are part of the wider learning systems that human beings have; so, just as the immune system learns from dealing with the organisms that invade our bodies, we can learn how to deal with a particular form of pain more effectively if we encounter it again. Those who have experienced emotional pain as young adults are likely to cope with it better as older adults (Maas and Kuypers, 1974).

Of course, if the pain is so severe that it prompts the body to close down our systems to protect us from the pain, we may not be able to learn from it. But, if it is not so severe, we can learn from the situation. If, however, we have a life largely free from physical and emotional pain, we may find that we have difficulty in coping with serious pain when we encounter it; for example, a friend who was knocked off his bicycle in an accident in his fifties never recovered his personal confidence thereafter.

So, a life completely without pain is not part of God's plan for us to grow as human beings; the gift of pain not only enables us to recognise and respond to physical or emotional harm to ourselves; if we do not abuse it, it also enables us to learn how to deal with physical and emotional harm more effectively the next time we encounter it.

That may not help those who, for whatever reason, find they are suffering pain all the time. But we need to look elsewhere for explanations of these situations rather than assuming that pain is always bad.

4 Where does destruction come from?

4.1 Energy exchange

While it would probably be unhelpful to see destruction as a gift of God, the process of energy exchange to sustain life often involves destruction; for example

- the heat of the sun is the result of a highly destructive energy exchange which scientists estimate will carry on for another five thousand million years — or longer than the earth has been in existence to date
- earthquakes and volcanoes recycle minerals which have become locked in the earth back into the atmosphere; if the earth had a solid surface rather than the cracked egg-shell surface that it has, it would not be possible to recycle these minerals into the atmosphere and so the energy they provide for us would be lost
- organisms that cannot photosynthesise light or obtain nourishment from breaking down chemicals in the environment in a relatively non-destructive way have to destroy other living matter in order to obtain their nourishment
- organisms that need protection from the elements either have to invade other organisms or use material from other organisms such as the skins of other creatures or fibres from which to weave garments or, in the case of trees, to build shelters
- human beings routinely destroy fossil fuels in order to obtain energy.

While the use of inorganic rather than organic materials to clothe and shelter human beings has developed over time, most notably in the twentieth century, it is important to recognise that the processes for obtaining these materials are often destructive.

Where organisms obtain their nourishment from other organisms, they cannot afford to destroy all the organisms that they consume in order to maintain themselves. A particularly virulent virus may kill a lot of people or animals but if it kills too many it will run out of people or animals to infect. A predator who kills all the prey in their area or whose prey is seasonal will have to move to another area to find more prey. Grazers, like human beings, who rely on grasses, nuts or fruit have to move on to new pastures or find ways of storing food for the periods when the things they eat are not available.

In these situations organisms have to decide whether to cooperate or to compete for food; some organisms form alliances with other organisms to provide food in exchange for protection from predators. The grasses have been particularly successful in persuading human beings to protect them in exchange for providing food for human beings.

Today competition for food and energy is a key motivation for human movement and for the destruction of the environment and of other human beings because human beings are not prepared to cooperate over the provision of food and energy and prefer to compete for it. So a lot of destruction arises not just from the destruction inherent in consuming other organisms or obtaining inorganic sources of energy but also from the choices human beings make to compete rather than to cooperate over these resources.

4.2 Normal system processes

Another way of looking at destruction is to see the creation of the universe as bringing about order and order is sustained by the connections between systems and their elements and among

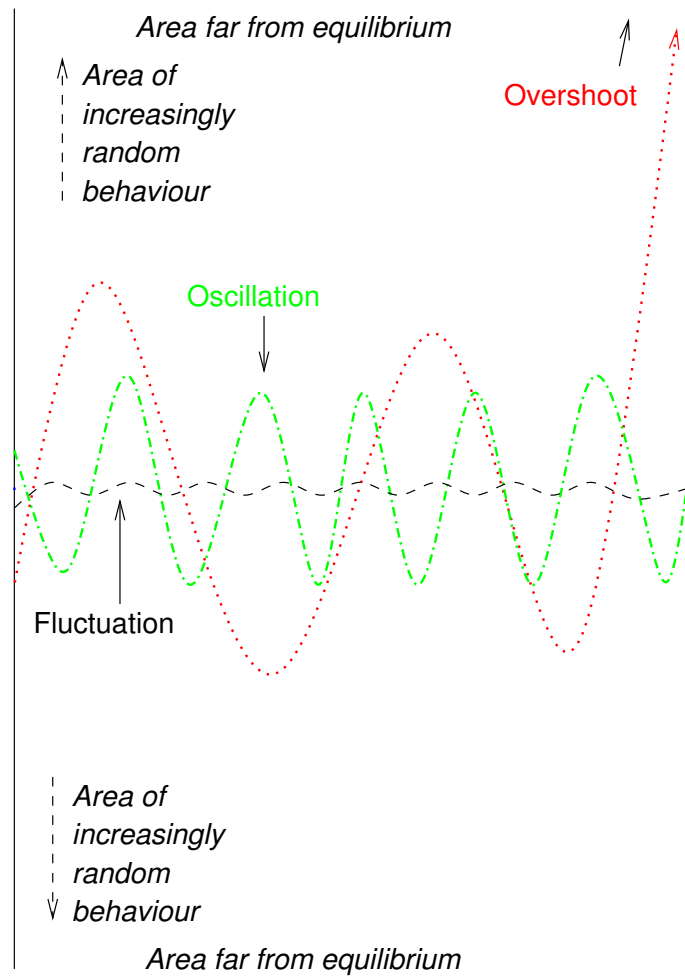


Figure 1: System behaviour

systems. Every system fluctuates (figure 1) — some so fast that you cannot see the fluctuations and some so slow that it takes millions of years to complete a cycle. A system that does not fluctuate has no connections and is dead.

As a system fluctuates it may move from one state to another. Sometimes, as in climate change, these changes are relatively smooth; other times, as in earthquakes and volcanoes, they are not. So, it is inevitable that, from time to time, those fluctuations will cause the destruction of various systems and the organisms that rely on them. In fact, it is estimated that the ‘mass extinctions’ resulted in around 98% of all known species dying out; but these ‘mass extinctions’ took thousands of years and Margulis and Sagan (1995) argue that many of the organisms that survived these ‘mass extinctions’ did so because they had chosen to co-operate with other organisms.

It had been thought that, because the connections within and between systems tend to fall apart over time in a process that scientists call ‘entropy,’ the entire universe would gradually fall apart and die. However, it is now clear that, when some systems go into ‘overshoot’ (figure 1) and destroy themselves as a result of the forces that affect their fluctuations, they can create completely new and unpredictable systems, thereby bringing new order into the

universe (Prigogine and Stengers, 1984).

4.3 Human mismanagement

In harvesting both organic and inorganic materials for their food, clothing and shelter, human beings have frequently destroyed entire landscapes. In what are now the deserts of southern Iraq, there were prosperous cities in the time of Abram which, as they grew, over-cultivated the surrounding land until it became desert and the cities retreated back into being small villages or were abandoned.

Paul could have sailed to Ephesus (Ac 20:16) but, as all the trees around Ephesus were cut down, the river silted up and visitors today find it miles inland. The Romans imported grain from North Africa long before they conquered southern Britain to obtain an alternative source of grain but you won't find grain fields in most of North Africa any longer. Even as recently as the 1930s and 1960s over-cultivation of the North American prairies and the Western African deserts led to destruction of the landscape.

The impact of sun and rain, wind and snow, heat and cold on systems varies according to the situation and most organisms have evolved systems to deal with variations in the amount of sun or rain, wind or snow, heat or cold falling on them. Migration and hibernation are both ways in which organisms have evolved to cope with seasonal fluctuations in temperature and/or the availability of food. In some ecosystems, organisms have found ways of surviving bush fires and regenerating the whole area after the bush fire which converts organic material into inorganic fertiliser for the soil. Thus new life arises out of the destruction of the old.

Landscapes and the ecosystems that support them will always adapt to the impact of the weather. But, as in the case of over-cultivation of the soil, human activity can influence the ways in which nature adapts. Building on flood plains, cutting down trees and burning off peat have all removed natural mechanisms for dealing with sudden rainfall which has then resulted in flooding. Human beings can take measures to deal with such situations in much the same way that the Dutch have increased the land area of their country by creating and then nurturing polders behind great sea walls. But they have also had to create an effective canal system to ensure that they can prevent water submerging their low lying land.

5 How should we respond to destruction

Since destruction is not only built into the structure of the earth but also part of the survival mechanisms of some organisms, including human beings, questions about destruction are often asked in these terms:

- why did God choose to build destruction into His creation?
- how should we respond to destruction?
- how far should we destroy any part of creation?

5.1 Why did God choose to build destruction into His creation?

1. Without some destructive processes, without death and rebirth, it would not be possible to create a relatively self-sustaining universe. As Jesus says, 'I tell you the truth, unless a kernel of wheat falls to the ground and dies, it remains only a single seed. But if it dies,

it produces many seeds' (Jn 12:24). In other words, God could have chosen to create a different type of universe but it would not have lasted as long or been as capable of such productivity.

2. To counteract the natural tendency of systems to lose the connections they have within themselves and with systems outside them and thus to move towards 'death,' God provided a way of creating new, unpredictable, systems out of systems that had become so unstable that their behaviour had 'overshot' (Prigogine and Stengers, 1984) (figure 1).

How novel an idea this is can be seen in Albert Einstein's rejection of quantum theory; he did not believe that God would 'play dice with the universe.' God does not play dice with the universe as a whole but allows a very small number of situations to occur in which there are purely random outcomes because that is the only way of creating some types of new order.

3. Some types of destruction, by combustion, by bacteria and by fungi, enable energy to be transformed and resources to be reused. We have used the energy stored in fossil fuels, themselves the by-products of organic processes and laid down in the earth many millions of years ago, to heat ourselves and manufacture a wide range of goods. Most people enjoy products that have been recycled by bacteria such as yeast and yoghurt and many enjoy mushrooms and other edible fungi.

5.2 How should we respond to destruction?

Like pain, where we need to distinguish between pain that is a gift from God and pain that is deliberately, negligently or unnecessarily inflicted, we need to distinguish between those destructive processes that God built into the universe for its and our benefit from those which involve negligent or unnecessary destruction. Naturalists have observed that many animals do not kill unless they are hungry; after all, there is no use raiding the pantry when you are not hungry and then seeing the food 'go off' because you are not ready to eat it. Moses tried to teach this lesson to the Israelites when he warned them about stockpiling manna (Ex 16:14–31).

Human beings in many societies have learned to use destructive events positively; for example, the Egyptians learned thousands of years ago how to harness the Nile floods to irrigate their fields while Indians learned how to manage their livestock and their crops in ways which meant that they benefited from the monsoon rains. Australian Aborigines learned the value of bush fires as a way of re-invigorating their soil. We have learned how to create millions of little fires inside our cars to make them move us and the things we want to move. We use electricity — which can potentially kill us — every day.

We should try to avoid destruction that ignores the ways in which the natural systems God has provided work — what in earlier generations would have been called 'ignoring God's natural laws.' Building on flood plains, burning off sphagnum moss on peat moors and living near active volcanoes are all choices that human beings in the Western world have made as a result of which they have experienced destruction. Unlike many peoples in the third world whose choices are constrained and who have to live near potentially destructive environments, those in the West do not — and yet many choose to. One reason is that people believe that they have the technology, or the 'mastery,' to 'fix' any potential destruction and, as the experiences of the Dutch have shown, it is possible to develop technological solutions to potential destruction if one pays proper attention to the ways in which the systems God has provided work.

If it is not obvious that some destruction is part of the natural order of recycling and renewing the resources that God has given us or a result of human failures to respect God's 'natural laws,' we may have to accept that there is some destruction that is as yet inexplicable to us (section 6) — for example, the destruction through cancer cells or Alzheimer's disease; in neither case is it clear that there is any wider benefit from the processes which underlie them.

5.3 How far should we destroy any part of creation?

Because we cannot synthesise the sun's energy, we have to destroy other living things in order to survive; some of them, like the grasses, allow us to do that as long as we look after enough of them to enable them as a species to survive; some of them give us fruit in exchange for looking after them. Some of them give us fruit regardless of whether or not we look after them.

As human beings have moved from being a largely nomadic species to a largely settled species — though a significant minority of human beings in all societies remain nomadic, whether moving through countries in the service of a multi-national company or following the available forage in an equatorial country — so they have used a wide range of organic and inorganic materials to clothe and house themselves and to keep them warm. Some of the things human beings do bring new order to the universe, even though they may involve the destruction of other things. For example, making 'paper' out of the papyrus enabled people to give order to their thoughts and to set down some of the first mathematics; similarly, making tablets of clay and scratching marks of them enabled the *magi* to bring order to their understanding of the skies. Since God gave us a mathematical ability that does not appear to exist in any other species, it would be strange if He never wanted us to put down what we had learnt to pass on to others. Similarly, without papyrus and later vellum, the Gospel would have had to be transmitted solely by word of mouth.

In the end, the answer may lie in the command to love our neighbour as ourselves: does our destruction of any part of God's creation harm ourselves or our neighbour, whether directly or because it harms a system on which we or our neighbour depends, and, if it does not harm ourselves or our neighbour, does it bring us or him/her any benefit? Christians over the centuries have been involved in many forms of destruction but how many of them have advanced the kingdom of God or the lives of themselves or their neighbours? Sometimes they have been damaging to themselves as well as to others.

6 But what about cancer, AIDS and birth defects?

Scientists have found explanations for some types of cancer — notably cervical and stomach cancer which are transmitted by a virus and a bacterium respectively — but no explanations for most of them. Cervical and bowel cancer share with leprosy and AIDS the characteristic that they do not cause significant, if any, pain in the early stages. So they evade our body's natural defence systems sometimes until it is too late to treat them. Also, unlike many viral infections which simply remain in the body until the virus has got what it needs from the human host, some make their homes in the human body.

While pain and destruction are both necessary for our survival as human beings and so can be seen as part of God's design even though we human beings often misuse them for our own ends, it is difficult to see where certain types of cancer, AIDS or certain birth defects can be part of God's design.

Here are some possible explanations:

- our misuse of drugs — God has given us many gifts, including the gift of understanding many natural processes so that we can develop ways of protecting ourselves against invasions by organisms that threaten us, but we have sometimes misused that knowledge so that a number of strains of virus and bacteria have developed resistance because of our misuse of drugs
- some birth defects may occur because of a chance coming together of several factors; if so, it may be very difficult to identify these factors because they happen relatively rarely
- some birth defects are less likely to happen in populations that have evolved in a particular way; perhaps God has given us the means to avoid some birth defects but we do not yet understand how to do so.

7 Responding to inexplicable destruction

Science has helped us, particularly in the last half century, to understand the causes of a lot of pain and destruction in the world. However, there are still many situations in which we may be unable to see any point in a particular destructive event. Perhaps the ways in which we respond to them may be more important than what caused them.

For example, the parents of a disabled child sometimes respond by seeking to change the situation which caused or has arisen out of their child's disability; in 1706 a disastrous shipwreck in the Scilly Isles arising from a miscalculation of longitude led to the offer of a prize for solving the problem of finding longitude at sea (Sobel, 1996); even when destruction creates harm, good can come out of it.

The ancient Greek playwrights often addressed this problem 2,500 years ago; they explained the events as caused by the gods or by fate but they focused on the responses of people to those events, not why they had happened. A Catholic priest made this point rather starkly in the aftermath of the destruction of the twin towers in 2001.

Today secular science cannot give us answers to inexplicable destruction; at best, science suggests that we can rephrase the traditional Christian discussion about the 'problem of pain' by saying that pain itself is not the problem; the problem is that there are some experiences of pain and destruction which appear to contribute nothing to the universe, which are not a result of human sin, about which we appear to be able to do nothing and which bring no longer term benefit to us, whether by warning us about harm or helping us to learn how to deal with it in future — something addressed in the story of Job and possibly by Jesus in His response to the question whether the blind man or his parents had sinned (Jn 9:3).

Perhaps the real difficulty is that we can find rational explanations for all sorts of pain and destruction that are present in the world but there are a few situations, like certain forms of cancer, AIDS and certain birth defects, where we cannot find any rational explanations and that leaves us dissatisfied and unsure. And not everyone finds the Christian answer to trust in God satisfying.

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