APPENDIX 6

ADAPTATION AND MALADAPTATION

In biology, adaptation has been defined as ‘the process of change by which an organism or species becomes better suited to its environment’. There are several different kinds of adaptation in biological systems. Particularly important are genetic, or evolutionary, adaptation and physiological adaptation.

Genetic adaptation is the kind of adaptation that has given rise to all the species of animals and plants on Earth today, including humankind. It is transgenerational and the main influence on its direction is natural selection.

Physiological adaptation consists of physiological changes in living organisms that render them better able to cope with an existing situation or threat. The heart will beat faster in a threatening situation – so that muscles are provided with more oxygen and so will perform better if needed (e.g. in running away or fighting). Another example is the immune response that enables organisms to fight off invading microorganisms.

In humankind there is another dimension to adaptation: cultural adaptation. Cultural adaptation can be defined as cultural changes which result in humans become better suited to their environment. The deliberate use of fire for cooking and as a source of warmth is an early example, as is the later introduction of farming.

However, there is another side to the picture. Not all changes in genetic material are beneficial. In fact the great majority of mutations are harmful. Such instances are referred to as genetic maladaptations.

Similarly, physiological responses can sometime be harmful. Autoimmune disease is a clear example of physiological maladaptation.

So, too, with culture. As cultures have evolved they have often come to embrace not only factual information of good practical value, but also assumptions that are sheer nonsense, leading to behaviours that are equally nonsensical. That is, cultures often get things wrong. Sometimes these cultural delusions have resulted in activities that have caused unnecessary distress in humans or unnecessary damage to local ecosystems. Such cases are examples of cultural maladaptation.

There are countless examples of cultural maladaptation in human history. A particularly tragic case was the ancient Chinese custom of foot-binding, which prevented the normal growth of the feet of young girls and caused them excruciating pain. This practice well illustrates the propensity of culture to influence people’s mind-sets in ways that result in activities that are not only nonsensical in the extreme, but also sometimes very cruel and destructive and contrary to nature. This particular cultural maladaptation was mutely accepted by the mass of the Chinese population for forty or more generations.

In Europe the long, drawn-out and often bloody conflicts between Protestants and Catholics, provide another example of absurd, unnecessary cultural maladaptation that caused an immense amount of human suffering.

Cultural maladaptations in ecological Phase 4 are manifold. Some affect humans directly, while others cause damage to the living in the environment on which we depend. At present some even pose a threat to the survival of civilisation, perhaps of the human species.

Fortunately, humans have the ability, through their capacity for culture itself, to bring culture back on track when it goes off the rails. Nowadays, when societies come to perceive the biological or social consequences of culturally inspired activities as undesirable, a period
of discussion and debate ensues about the causes of the problem and possible remedies. Eventually new understanding can bring about modifications in cultural assumptions and priorities, leading to appropriate changes in human activities. This societal process is referred to as cultural reform.

Cultural reform is often quite complicated, involving prolonged interactions between different interest groups in society. A key role is often played initially by minority groups, occasionally by single individuals, who start the ball rolling by drawing attention to an unsatisfactory state of affairs. A good example is Rachel Carson who, in her ground breaking book *Silent Spring*, drew attention to the insidious and destructive ecological impacts of certain synthetic pesticides.

Almost invariably these expressions of concern coming from reformers are promptly contradicted by others, the counter-reformers, who set out to block the reform process. This predictable backlash often involves, but is not restricted to, representatives of vested interests who believe that the proposed reforms will be to their disadvantage.\(^1\) They are likely to argue that the problem does not exist or that it has been grossly exaggerated, and they try to ridicule the reformers by calling them alarmists, fanatics, scaremongers and prophets of doom. Nowadays some of the counter-reform forces are extraordinarily powerful.

Eventually, if the reformers are successful, a change comes about in the dominant culture and members of governmental bureaucracies and other organisations set about working out ways and means of achieving the necessary changes. Their efforts may still be hindered by the stalling tactics of counter-reformers.

Cultural reform may be corrective or antidotal. Corrective reform occurs when the adaptive process involves correcting the underlying cause of maladjustment or disharmony. An example is provided by the restoration of vitamin C to the diet of a population suffering from scurvy. In antidotal reform the unsatisfactory conditions which are the underlying cause of disturbance are not modified, and the adaptive response is aimed at alleviating the symptoms or at an intermediate factor. Most, but not all of the work of the medical profession is antidotal rather than corrective.

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