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## Health and civilisation

### Biological background

One of the natural outcomes of the processes of evolution is the fact that animals become well adapted in their biological characteristics to the habitat in which they are evolving. This is because evolution selects for characteristics – structural, physiological and behavioural – which tend to increase the likelihood that individual specimens will perform optimally in that environment, will overcome its hazards and will survive long enough to reproduce. In other words, the biological characteristics of any species are such that the individual animals are likely to experience good health in their natural environment.

If an animal is removed from its natural environment, or if its environment changes significantly, then it is likely to be less well adapted to the new conditions, and consequently some signs of physiological or behavioural maladjustment can be expected. This is a fundamental biological principle, here called the *evolutionary health principle*.

It follows from this principle that if we want to identify the health needs of any particular kind of animal, the first thing to do is to study the conditions to which it is exposed in its natural habitat, because we can be sure that these conditions are capable of providing all the essential ingredients for maintaining and promoting health in that species.

In the case of humankind, our basic biologically determined health needs are the same now as they were many thousands of years ago. Biologically, we are the same animal as our pre-farming forebears of, say, 10 000-20 000 years ago – that is, an animal adapted genetically, through evolution, to the hunter-gatherer conditions of life. There have certainly not been a sufficient number of generations of people living in cities to produce a new breed of humanity better adapted genetically than our hunter-gatherer ancestors to urban life.

There are countless examples of ill-health in humans resulting from exposure to conditions deviating significantly from those prevailing in the natural habitat of the species.

### *Universal health needs – physical*

The evolutionary health principle clearly applies to a wide range of physical aspects of life conditions in humans. There is no diet better for us than that which was typical for hunter-gatherers, and noise levels much higher or much lower than those typical of the primeval environment are likely to be deleterious for health. It is also clear that the principle is applicable to some aspects of behaviour. For example, health is likely to be impaired if levels and patterns of physical exercise deviate significantly from those of humans in the natural habitat.

Applying the evolutionary health principle and taking our knowledge of the conditions of life of hunter-gatherers as a starting point, we can put together a working list of the physical conditions likely to promote health and well-being in our species (Box 1). We refer to them as universal health needs, because they apply to all members of the human species wherever or whenever they may be living.

## Box 1

**Universal health needs of the human species – physical**

Clean air (not contaminated with hydrocarbons, sulphur oxides, lead etc.)

A natural diet (that is, calorie intake neither less than nor in excess of metabolic requirements; foods providing the full range of the nutritional requirements of the human organism, as provided, for example, by a diverse range of different foods of plant origin and a little cooked lean meat; a diet that does not contain an excess of any particular kind of chemical constituent or class of food; foods with a physical consistency of that of natural foods and containing fibre; foodstuffs devoid of potentially noxious contaminants or additives)

Clean water (free of contamination with chemicals or pathogenic micro-organisms)

Absence of harmful levels of electromagnetic radiation (e.g. alpha, beta, gamma, ultraviolet, microwaves and x-rays)

Minimal contact with parasites and pathogens, but contact with natural environmental micro-organisms

Protection from extremes of climate (temperature, wetness)

Levels of sensory stimulation which are neither much lower, nor much higher, than those of the natural habitat and noise levels within the natural range

A pattern of physical activity which involves some short periods of vigorous muscular activity and longer periods of medium (and varied) muscular activity, but also frequent periods of rest.

*Psychosocial health needs of the human species*

There are good reasons for supposing that the evolutionary health principle also applies to relatively intangible aspects of life experience. The life conditions of hunter-gatherers are usually characterised, for example, by incentives and opportunities for creative behaviour, a sense of personal involvement in daily activities and a good deal of convivial social interaction. Most of us would agree that such conditions are all likely to promote health and well-being in our own society. It is important that we take them into account in assessing the quality of life in our own society today and in considering options for the future.<sup>1</sup>

A list of postulated psychosocial determinants of health based on this evolutionary approach is presented in Box 2.

Box 2

This list is not definitive, and other people would use different terms to describe these aspects of experience, or they might add further items that they consider important. But all the items listed here were characteristic of the life conditions of our ancestors in the natural habitat of the human species, and are therefore at least compatible with optimum performance.

A case in point is a sense of personal involvement and purpose in daily activities, linked with a sense of belonging to a community. Certainly, this kind of experience was built into the hunter-gatherer life style and was shared by all adults. It was also experienced by adolescents, who felt personally involved as they learned the skills of adults and attempted to prove their worth in the daily affairs of the band to which they belonged.

It is true that not every item listed is absolutely essential for health. Lack of satisfaction of one psychosocial health need may be offset to some extent by the satisfaction of others. Nevertheless, it is suggested that every item on the list will, if satisfied, make a positive contribution to health and well-being.

Brief comment is called for on the concept of stressors and meliors. Stressors – that is, experiences which cause anxiety and distress – are a normal aspect of life. If they are short-lived and not too severe, they can contribute positively to the quality of life and well-being. But if they are excessive, and if they persist, they may interfere with both mental and physical health.

Equally important as influences on human well-being are experiences that have the opposite effect to stressors and that give rise to a sense of enjoyment. Such experiences have been called meliors. Meliors may include, for example, the experience of creativity, fun, aesthetic enjoyment, affection or conviviality.

Every person can be considered, at any given time, to be at some point on a hypothetical continuum between a state of distress and a state of enjoyment. An individual's position on this continuum is largely a function of the balance between meliors and stressors his or her recent experience. Social changes that result in the erosion of meliors are therefore just as undesirable as those that result in an increase in stressors.

The cultural environment has an immense influence both on the levels of meliors and stressors in an individual's daily experience as well as on the nature of the factors that cause them. It also affects the energy and pollution costs of attempts to avoid stressors or to experience meliors.

**Box 2****Universal psychosocial health needs of the human species**

An emotional support network, providing a framework for care-giving and care-receiving behaviour, and for exchange of information on matters of mutual interest and concern

The experience of conviviality

Opportunities and incentives for co-operative small-group interaction

Opportunities and incentives for creative behaviour

Opportunities and incentives for learning and practising manual skills

Opportunities and incentives for active involvement in recreational activities

Opportunities for spontaneity in human behaviour

Variety in daily experience

Short goal-achievement cycles and aspirations of a kind likely to be fulfilled

An environment and lifestyle conducive to a sense of personal involvement, purpose, belonging, responsibility, challenge, comradeship and love

An environment and lifestyle which do not promote a sense of alienation, anomie, deprivation, boredom, loneliness, or chronic frustration.

### **Impacts of civilisation – past and present**

Over the ages, human culture, through its effects on the biophysical environment and on people's behaviour, has had major impacts on human health. Some of these impacts can be regarded as positive. For instance, the farming way of life offered protection from predators and less chance of serious injury in hunting.

On the other hand, civilisation resulted in humans being exposed to new conditions which differed significantly from those to which the species was adapted through evolution. In accord with the evolutionary health principle, some of these changes gave rise to serious forms of maladjustment. The most notable of these diseases of early civilisation were malnutrition due to specific dietary deficiencies, like rickets, scurvy, beri beri and pellagra, and a range of contagious diseases including typhus, typhoid, plague, cholera and smallpox.<sup>2</sup>

Sometimes cultural developments have resulted in interference with the universal health need for clean air. A good example is provided by the history of air pollution in London resulting mainly from the burning of coal. Serious concern had been expressed about this problem from the beginning of the fourteenth century. It is only in the last half century that cultural reforms have brought about a significant improvement in the situation, with major benefits for the health of Londoners. Air pollution is still a very serious problem in many cities, especially in the developing world.

Thus civilisation, while affording some protection against primeval causes of ill health and death, introduced new diseases which were responsible for very high death rates in many early urban environments. The populations of these societies were probably maintained by continuing immigration from rural areas, where by far the greater part of the total human population lived and where death rates are likely to have been lower. The end result was an overall increase in the total human population from around 5 to 10 million when farming was first introduced to about 600 million in 1700 AD. This is a doubling time, on average, of between 1500 and 2000 years.

The spectacular drop in the incidence of the serious infectious diseases and malnutrition in the past century or so, especially in the developed countries, has been due to extraordinarily effective cultural reform directed at these causes of ill health. The following factors have been especially important: improved sanitation; improved nutrition following improved understanding of human dietary requirements; immunisation programs; and the introduction of antibiotics.

As a consequence of the protection that modern civilisation now provides against both the hazards of the primeval lifestyle and the diseases of early civilisation, death rates have been drastically lowered, especially in the developed countries, and life expectancy at birth is higher than ever before. As a result, the doubling time of the total human population in the last part of the 20<sup>th</sup> century was around 35 years.<sup>3</sup>

Although there has been a spectacular drop in the incidence of serious bacterial disease, modern populations are exposed to an ever-increasing number of pathogenic viruses that cause relatively mild diseases like the common cold, influenza and various gastro-intestinal disturbances. Although these infections are seldom fatal, they nonetheless interfere with people's enjoyment of life. These are relatively new diseases, because they can only exist if there is a large contiguous human population to keep them going. They could not have survived in hunter-gatherer times, nor probably throughout most of early civilisation.

Much more serious has been the advent of Acquired Immune Deficiency Syndrome (AIDS) due to infection with HIV. While this disease is not a major cause of death in Australia, over three million died of AIDS world-wide in 2003.

With respect to bacterial disease, a serious cause for concern at the present time is the emergence of antibiotic resistant strains of disease-causing bacteria (e.g. certain strains of *Staphylococcus aureus*).

A conspicuous deviation from natural conditions in today's society is the deliberate inhalation of smoke from burning leaves of the tobacco plant. Since Europeans first picked up this habit from native Americans in the 16th century, the practice has spread to all parts of the world.

Tobacco smoking causes cancers of the lung, lip, nasal cavities, pharynx, larynx, pancreas and bladder. About a third of all cancer deaths and 80 per cent of cases of lung cancer are due to smoking. Smoking also doubles the risk of heart attack, and is responsible for around 40 per cent of strokes in people under forty. Almost all smokers develop some form of emphysema, the severity of which is proportional to the number of cigarettes smoked each day and the number of years a person has smoked. Three quarters of cases of chronic bronchitis are due to smoking; and smoking increases, by about ten times, the risk of gangrene due to narrowing of the leg arteries. On average, smokers die 6 years younger than non-smokers. Between a third and a half of all smokers end up dying from cancer or heart disease caused by their addiction.

Whereas in most countries in the developed world the majority of adults do not smoke, cigarette sales are at present booming throughout Asia and the former Soviet bloc. In Japan, for example, 60 per cent of the men are smokers. Globally, cigarette smoking is increasing by 1 per cent a year. There are now about 1.1 billion smokers in the world, and the number is expected to increase to 1.6 billion by 2025. It is estimated that by 2020 more people will be killed by tobacco than by any other cause of death.

Although the psychological effect of nicotine is less dramatic than drugs like heroin and cocaine, its addictive power is at least as great.

#### *Cardiovascular disease and cancer*

The two leading causes of death in our society today are cancer and cardiovascular disease, and many cases involve are preventable.

Cardiovascular disease is largely a response to unnatural lifestyle factors. The main detrimental influences are tobacco smoking, lack of physical activity, overeating, a high intake of certain saturated fats and a low intake of certain polyunsaturated fats in the diet.

Many cases of cancer are also the result of people's behaviour patterns, including, of course, tobacco smoking. Lack of plant fibre in the diet contributes to cancer of the colon, and high intake of certain fats in the diet increase the likelihood of breast cancer. Overeating is also believed to contribute to the incidence of cancer. Environmental pollutants are another important cause.<sup>4</sup>

#### *Quality of life and mental health issues*

According to the World Health Organisation, mental illness now accounts for almost eleven per cent of the total 'disease burden' world-wide.

It is difficult to pinpoint the causes of mental illness, although it seems very likely that it is often a response to lack of satisfaction of the universal psychosocial health needs of the human species. Certainly, there have been major changes in the quality of life in Western countries, including Australia, over the past half century. If the number of hours sitting in front of a television screen is taken as a measure of well-being, then undoubtedly the population is vastly better off than it was, say, half a century ago. We would come to a similar conclusion if we took the *per capita* rate of use of material resources as our measure of the good life, or the number of kilometres travelled in fast-moving vehicles.

On the other hand, what would our answer to this question be if we took the indicators of well-being to be such aspects of life experience as creativity, sense of personal involvement and purpose, experience of conviviality, warm relationships with members of the extended family, contemplation of the natural beauty of the wilderness, and absence of fear of robbery or violence?

Certainly, cultural changes since the urban transition, and especially in the high-consumption societies, have had a profound effect on people's psychosocial life experience. Especially important is the fact that many adolescents in the modern setting experience little sense of personal involvement and purpose in their daily lives, sometimes with serious consequences for themselves or for other members of society.

One of the outstanding characteristics of contemporary urban civilisation, as contrasted with primeval society, is the enormous variation within populations in these psychosocial aspects of life experience. Some occupations are associated with hour after hour of repetitive, tedious and boring activity, while others provide plenty of variety, challenge and enjoyment. The experience of conviviality is also much more evident in some subcultures than in others. Similarly, some people are part of rich mutual support networks, while others are very much out on their own. Sheer soul-destroying loneliness is commonplace in modern urban society.

Because these less tangible aspects of life experience, unlike diet, air quality, noise levels and income, cannot be easily measured or assessed in a scientifically satisfactory way, and because we are not practised at talking about them, there is a real risk that cultural changes might bring about their progressive erosion without eliciting any social response aimed at preserving or restoring them. They are not taken into account in our society's conventional measures of social well-being, and they do not feature on the platforms of the major political parties.

#### *A note on consumerism and human well-being*

Consumerism is an outstanding characteristic of life in the developed countries of the modern world. The current economic arrangements mean that high levels of employment are dependent on high rates of consumer spending, and the economy is judged to be healthy when consumer spending is high. This fact has important ecological implications, because most consumer spending is on goods or services that involve the use of material resources and energy and the production of technological waste products. In fact, present patterns of consumerism in the affluent countries are simply not ecologically sustainable in the long term.

Whereas humans can, of course, experience health and a high quality of life without high levels of acquisition of material goods, it seems that in our present cultural setting most people have become dependant on consumerism for their well-being. Over the past couple of generations selecting and purchasing manufactured goods has become an important source of enjoyment, countering the undesirable effects of boredom and other environmental stressors. A common and often effective response to a feeling of depression is a shopping spree; and the human tendencies to seek approval, attention, status and novelty all lead to active consumer behaviour.

Perhaps consumer behaviour is now compensating for the decline of various meliors that were characteristic of earlier societies and that cost little energy and material resources – such as creative behaviour, the experience of conviviality, a sense of personal involvement and singing and dancing. The forthcoming inevitable collapse of consumerism will need to be accompanied by the re-introduction of these ancient sources of enjoyment.

According to recent studies in the United States, per capita consumption has increased by 45 per cent over the past twenty years. However, during the same period of time the quality of life, as measured by the 'Index of Social Health', decreased by 51 per cent. Our material standard of living here in Australia, as reflected in figures for energy use, is now more than twice what it was in 1965: but is there any evidence that people are enjoying life any more now than they were 41 years ago?

From the ecological standpoint, it is significant that in the modern cultural setting the following basic behaviours usually cost significantly more energy, and create more pollution, than they did at other times

in history: seeking in-group approval; seeking to conform; seeking attention; seeking novelty, excitement and variety; seeking comfort; visiting relatives; being selfish; being greedy; and being generous.

### *Disparities*

One of the outstanding features of modern civilisation is the fact that, unlike primeval and early farming societies, there are gross disparities in the health status of different parts of the human population. To mention just one example, the rate of mortality in childbirth in Somalia is 1 in 7, compared with 1 in 5100 in the United Kingdom.

Disparities also exist within nations. In Australia in the period 1991 to 1996, for example, there were about three times as many deaths among indigenous people as there would have been if this population had the same death rates as the total Australian population. Life expectancy at birth for indigenous Australians was estimated to be 56.9 years for males and 61.7 years for females, as compared with the all-Australian estimate of 75.2 years for men and 81.1 years for females.<sup>5</sup>

### **The future**

Looking to the future, three points need emphasis.

First, people's conditions of life and lifestyles must be in tune with human nature. That is, they must satisfy the innate biologically determined health needs of the human species. They must satisfy not only physical health needs, such as good, uncontaminated food, clean air, clean water and adequate shelter, but also psychosocial needs, like opportunities and incentives for creative behaviour, an aesthetically pleasing environment, the experience of conviviality and a sense of personal involvement in daily activities. It is likely, and certainly desirable, that the new biosensitive society will, in scaling down consumption of resources and use of energy, put a great deal more emphasis than it does at present on these psychosocial health needs, including the need for a sense of meaningful challenge to be built into people's life experience, especially in the younger generation.

Second, unlike the situation today, the physical and psychosocial health needs must be satisfied in all sections of society, and in all ethnic and racial groups.

The third point is that these health needs of the human population must be met in ways that are consistent with the satisfaction of the health needs of the biosphere. This means that lifestyles must be in keeping with major reductions in the use of energy and material resources across society, and they must not involve activities that directly or indirectly cause significant chemical pollution, land degradation or loss of biodiversity. Fortunately, we know that humans are perfectly capable of living healthy and enjoyable lives in communities with vastly lower rates of material consumption than those of our current society.

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<sup>1</sup> For further discussion on psychosocial health needs see PAN Paper B.2.3

<sup>2</sup> For further discussion on infectious disease see PAN Paper B.2.4.

<sup>3</sup> For further discussion on population changes in the human population see PAN Paper B.3.8.

<sup>4</sup> For a more detailed discussion of the causes of ill health in present-day society see PAN Papers B.2.2 and B.2.3.

<sup>5</sup> For further discussion on disparities in human conditions of life see PAN Paper B.2.1.