

Charles Condert (discussed in the text) demonstrated this type of apparatus in 1832. There are many other examples.

The clarity of Phillips's thinking is also occasionally called into question. For example, in a discussion of how the present atmosphere evolved, he says: "Nitrogen levels gradually rose during this time but, because nitrogen was non-toxic, it tended to higher and higher partial pressures"; and "Only after the physiology of the lungs at sea-level and the laws governing the atmosphere itself could be understood, could the lungs function successfully using compressed air below

sea level." He states that the history of DCS can serve as a model for understanding other occupational or engineering-induced diseases that may arise in the future, but there is no evidence for this.

A more fundamental defect is the author's obvious lack of training or experience in the field and his poor grasp of basic knowledge of the pathophysiology of DCS or air embolism; when he attempts to interpret what he has gleaned the picture is very muddled. In the last chapter, he gives 10 major statements regarding DCS: these are very naive and in some cases are not accepted by

those in the field.

*The Bends* will be interesting to those who are not familiar with the topic and want a short introduction to the history of diving and caisson work. It is not recommended for anyone who has a knowledge in the area, who would find the mistakes, omissions and misinterpretations irritating. The list of references is reasonably complete except for the glaring omission of R.H. Davis's classic *Deep Diving and Submarine Operations* which contains most of the historical material in this text and would be useful to those who want to learn more. □

## In retrospect chosen by Roger Short

### An Essay on the Principle of Population

by Thomas Robert Malthus (1798)

Edited with an Introduction by Antony Flew (Penguin, 1982)

The Revd Thomas Robert Malthus is surely one of the most maligned and misunderstood of men. It is exactly 200 years since the publication of his first, anonymous edition of *An Essay on the Principle of Population, As It Affects the Future Improvement of Society*. The stimulus for writing this polemic was his concern about the unwarranted euphoria of his colleagues, who in the aftermath of the French Revolution saw mankind progressing ever upwards to a world of universal abundance, peace and prosperity, where all would be equal in health, wealth and happiness. He wished to de-bunk this utopian fantasy, and used his numeracy (he had graduated from Cambridge with the equivalent of a First in Mathematics) to point out a simple truth:

*The power of population is indefinitely greater than the power in the earth to produce subsistence for man. Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical ratio. A slight acquaintance with numbers will shew the immensity of the first power in comparison to the second. By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal. This implies a strong and constantly operating check on population from the difficulty of subsistence. This difficulty must fall somewhere and must necessarily be severely felt by a large portion of mankind.*

This "Dismal Theorem", published when Malthus was only 32, was viciously attacked by Karl Marx, Frederick Engels and other like-minded social reformers of the day, who could not accept the idea that the poor would always be with us. But at the same time it was welcomed by Charles Darwin and Alfred Russell Wallace, as it showed them how survival of the fittest might ultimately result in the evolution of new species.

Alas, Malthus's pessimistic forebodings



about the difficulty of subsistence have been verified by subsequent events. Today, according to the World Bank, over one billion people are living in absolute poverty, and 600 million are on the borders of starvation. But contrary to Malthus's predictions, there has been an exponential growth in population. He was writing at a time when the world's population was a mere one billion; he would never have guessed that today it would have increased to around six billion, and is projected to reach 9-10 billion by the year 2050. Whatever happened to Malthus's "strong and constantly operating check on population"?

Summarizing his views on "The Principle of Population" in 1830, Malthus concluded that the checks could be of two kinds. They were either voluntary and "preventive", through late marriage and sexual restraint (Malthus was an exponent of both), or they were "positive", as exemplified by "promiscuous concubinage" (contraception), "improper arts to conceal the consequences of irregular connections" (abortion), and "wars, infanticide, plague and

famine" — in short, a catalogue of misery and vice. Malthus's condemnation of contraception within marriage was only reversed by the Anglican Church in 1930.

Malthus, who was still a bachelor in 1798, was understandably unaware of the fact that lactational amenorrhoea, the inhibitory effects of suckling on ovulation, is nature's most important check on human fertility. The erosion of traditional breastfeeding practices by urbanization, and by the premature introduction of animal milk or infant milk, has been one of the major factors that has stimulated human fertility; this, coupled with the conquest of infectious diseases in infancy and childhood, has fuelled the exponential growth of the human population.

I have often wondered why Malthus chose to publish the first edition of his essay anonymously. Was it all just too embarrassing for the shy young bachelor don of Jesus College, Cambridge, who had only recently taken Holy Orders? Was his discussion of the essential nature of "the passion between the sexes" too strong meat for his celibate colleagues at High Table? How were Malthus's views on population received by the young gentlemen of the East India Company, attending its college at Haileybury where Malthus held the Professorship in Political Economy (the first in Britain) from 1805 until his death in 1834? Did it ever dawn on them that increasing human numbers would eventually make India ungovernable by a small colonial power such as Britain?

At the end of the day, we should remember Malthus for posing the unanswerable question to all the world's political economists — how far can we afford to go to alleviate poverty? His "Dismal Theorem" will haunt us in the coming century, as the gulf between developed and developing nations continues to widen, and the poor struggle to scrape a living from the surface of our increasingly denuded planet. The help we are prepared to give to those less fortunate than ourselves will be the ultimate measure of our humanity.

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