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The Malthusian Trap

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The Reverend Thomas Robert Malthus was born in 1766 and died in 1834. He was the son of a clergyman and one of eight children. He was educated at Jesus College, Cambridge and later became Professor of History and Political Economy at the East India Company's College at Haileybury in Hertfordshire. His most famous work, the *Essay on the Principles of Population*, was published in 1798 when he was 32. It has been seen partly as a reaction to the Utopian thought of William Godwin and others, as well as that of Malthus' own father. It is as an extension and formalization the classical economist Adam Smith and others who had laid down some of the basic ideas concerning the tendency of population to outstrip resources.

Malthus' theory in brief was that humankind is permanently trapped by the intersection of two 'laws'. The first concerned the rate at which populations can grow. He took the 'passion between the sexes' to be constant and investigations showed that under conditions of 'natural' fertility (with early marriage and no contraception, abortion or infanticide), this would lead to an average of about fifteen livebirths per woman. This figure is confirmed by modern demography. Given normal mortality at the time, and taking a less than maximum fertility, this will lead to what Malthus called geometrical growth, namely 1,2,4,8,16. It only needs 32 doublings like this to lead from an original couple to the present world population of over six billion persons.

The second premise was that food and other resource production will grow much more slowly. It might double for a generation or two, but could not keep on doubling within an agrarian economy. Thus there could, in the long run, only be an arithmetic or linear growth of the order of 1,2,3,4. Incorporated in this later theory was the law of diminishing marginal returns on the further input of resources, especially labour. Underpinning the scheme was the assumption that there was a finite amount of energy available for humans through the conversion of the sun's energy by living plants and animals. The conclusion was that humankind was trapped, a particular application in the field of demography of the more general pessimism of Adam Smith. Populations would grow rapidly for a few generations, and then be savagely cut back. A crisis would occur, manifesting itself in one (or a combination) of what he called the three 'positive' checks acting on the death rate, war, famine and disease.

After the publication of this theoretical account of the 'laws' of the trap, Malthus undertook a great deal of empirical research, travelling through Europe and reading widely in history and anthropology. On the basis of this he published what is termed the Second Edition of *The Principles* but is, in effect, a very different book. Basically he turned his laws of population into tendencies, likelihoods or probabilities, to which there were exceptions. The trap became avoidable. For he had discovered in England itself, as well as Switzerland and Norway, that there were what he called 'preventive checks' which could act to keep down the fertility to a level which would be in line with resource growth. He divided these into 'moral restraint' (celibacy and delayed

marriage) and 'vice' (contraception of all kinds, abortion and infanticide), of which he disapproved.

Malthus believed that the only force strong enough to overcome the biological drive to mate was a set of desires created in a society and culture where people were affluent, unequal and ambitious for social status. They would forgo the delights of large families for other goals. A mixture of human avarice and human reason could lead people to avoid the trap.

Malthus' work was hugely influential at the practical level. He contributed significantly to the discussion of the reform of the Poor Law and to the ideas of how to run the British Empire, many of whose administrators he taught at the East India Company's College. He is also the only social scientist who has had a revolutionary effect in the biological sciences. His idea that humans normally suffer from very high mortality rates, that war, famine and disease periodically cut swathes through historical populations, was seminal. Entirely independently, both Charles Darwin and A.R. Wallace described how reading Malthus' Principles provided them with the key to unlock the secret of human evolution, that is the principle of the survival of the fittest, of random variation and selective retention.

Malthus wrote before the huge resources of energy for humankind locked up in coal and then oil became widely available. For a while, from the middle of the nineteenth century, it looked as if the Malthusian trap was no longer operative. A combination of science (in particular chemistry) and of new resources had made it possible to more than double production in each generation. First England, then parts of Europe, Japan and elsewhere escaped from the trap. His laws could be inverted. Population grew slowly, resources exponentially.

Yet now in the early twenty-first century, as the resources reach their limits and the external costs of the massive use of carbon energy become apparent in pollution and global warming, it appears that the ghost of Malthus has arisen again. Likewise, as we realize the ability of micro-organisms to outpace human medicine, our overcoming of disease in an increasingly crowded world seems at risk. Finally, the tensions that lead to war are further aggravated by shortages and crowding.

Malthus' realistic message that we can postpone the crises of war, famine and disease, but that they will almost certainly strike again in a much more serious way within an increased total population, again makes sense. His advice, that only by stabilizing and probably reducing total population levels through the rational control of fertility, seems ever more salutary. Like all traps, the Malthusian one can be avoided. Yet it can only be circumvented if we are constantly aware of its nature as specified by the lucid first theoretical exponent of the biological limits imposed by human nature and the physical world.

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