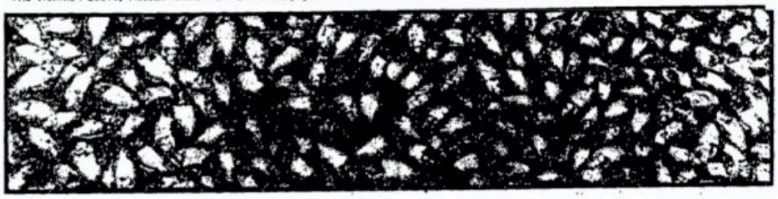
The prophets, and doom
The Guardian (1959-2003); Jan 28, 1972;
ProQuest Historical Newspapers: The Guardian and The Observer
pg. 12

The prophets, and doom

Professor Barry Commoner and Dr Paul Ehrlich are leading American scientists on world pollution problems. Yesterday, Commoner's latest book was published here and Ehrlich was among its first critics. ANTHONY TUCKER, our science correspondent, analyses these two important views of the future.

The victims . above, viscous waste from a French paper mill ; below , dead fish in a sterile lake in Florida.



"WHATEVER HIS personal aims, values, and prejudices, when a scientist speaks and publishes openly—presenting facts, interpretations, and conclusions—he has done his service to the truth. For science gets at the truth not so much by avoiding mistakes or personal bias as by displaying them in public where they can be corrected."

Professor Barry Commoner in "The Closing Circle."

THE GREAT Debate of 1972 is not about the Common Market: it is about overpopulation, environmental deterioration, and the chances of human survival. Influential individuals and groups have now drawn out their positions for battle, and a new dimension of power is expanding the thrust and purpose of arguments that have been growing steadily since the global rain of strontium-90 in the fifties. Since then the voice of Professor Barry Commoner has been distinct and authoritative in the leading echelon of the environmental movement, arguing vehemently and persuasively for the establishment of technological systems which, instead of being hostile and destructive, are ecologically sound like life systems themselves.

Over the years the arguments have become more subtle, more bitter, and more complete, and into the rising wave of concern Barry Commoner has now distilled his views in a book (The Closing Circle: Cape, £2.50) which is both a primer in ecology and a credo for the foundation of a new society. It is a sign of the times and of growing awareness that it has already run into harsh criticism, not at the hands of those seeking to preserve the status quo, but at the hands of others no less deeply concerned than Commoner about the future of mankind. The attack has a solid base and has been circulated in the form of a high-powered document "One Dimensional Ecology" by Professor Paul Ehrlich and John P. Holdren. More of that later: first the book.

With an implicit apology for the inadequacies of science, it defines ecology and goes on to draw in some details of the incredibly complicated interrelationships in the environment, pointing to hard examples of the poisoning of air, earth, and water. It exposes the "technological flaw" of existing systems and moves on to social and economic implications of ecology, the question of survival and the desperate need to close our open-ended throw-away systems so that they harmonise with those of Nature. Life is a very powerful form of chemistry, says Commoner, immensely complicated and highly vulnerable.

"Every living thing is dependent on many others, either indirectly through the physical and chemical features of the environment or directly for food or a sheltering place. Within every living thing on the earth, indeed within each of its cells, is contained another network—on its own scale as complex as the environmental system—made up of numerous, intri-

'We have so long neglected the task of understanding natural complex processes, such as those of the environment, that our methods are still crude and uncertain' . . . Commoner.

cate molecules elaborately interconnected by chemical reactions, on which the life properties of the whole organism depend. Few of us in the scientific community are well prepared to deal with this degree of complexity. . . ."

Such a confession might be regarded nowadays as a truism, for it is recognised that the arbitrary simplifications required in scientific training and experiment have little bearing on the realities of the environment or of biological processes. But Commoner goes farther. "We have so long neglected the task of understanding natural complex processes, such as those of the environment, that our methods are still crude and uncertain." This, from an eminent biologist, should be read as a warning by those who would pretend any assurance about the interaction of technologies and natural processes.

When politicians and others claim blandly that "we are all ecologists now" they reveal their own gross ignorance. Ecological understanding is fragmentary and uncertain and, in that most important sense, there are as yet no ecologists. And, as Aldo Leopold pointed out with great sensitivity 25 years ago, those with some understanding of ecology live in a private world of wounds. Since then the wounds have festered and gaped. Even blind men are beginning to sense them.

Commoner looks at the air of Los Angeles, the nitrate sodden soil of Illinois, and the filth of Lake Erie and concludes that "something went wrong after the Second World War for most of our serious pollution problems either began in the postwar years or have greatly worsened since then." Having already pointed out that the increasing affluence of US society has been accompanied by a decline in the quality of diet, he searches for an explanation of why in the years since the war, pollution levels have risen by 2,000 per cent. It cannot be explained by population growth, he claims, nor affluence, for the growth of both has been too small.

Commoner is, in fact, on very shaky ground here, for as Paul Ehrlich points out, environmental impact is calculated by the multiplication of separate factors such as population and "affluence," and it is wrong to search for a single dominant cause such as "pollution." Yet this is the route of Commoner's argument. "There are good theoretical grounds why economic growth can lead to pollution. The rate of exploitation of the ecosystem, which generates economic growth, cannot increase indefinitely without overdriving the system and pushing it to the point of collapse," he writes, and few would disagree with him. Yet he goes on to decouple economic growth, affluence, and population growth from the environmental crisis, and to assume that it is mainly a matter of how we go about things, how well we conserve, and how well we control pollution, that will determine the survival or failure of technological societies.

But he does not decouple the underlying economic pressures which lead to environmental abuse. In Illinois in 1949, he points out, about 20,000 tons of fertiliser nitrogen were used to produce a corn yield of 50 bushels per acre, while in 1968 the same area used 600,000 tons of fertiliser to produce a yield of 93 bushels per acre. The law of diminishing returns, which is crucial in relation to problems of population growth and "affluence" is so clearly expressed in these figures that it is surprising that it passes unnoticed in the text. Commoner apparently sees only the problem of nitrate pollution and concludes that "since the cost of fertiliser, relative to the resultant gain in crops, is lower than that of any other economic input, the new technology pays him (the farmer) well."

The cost, and apparently to Commoner this is the only cost, "is borne by his neighbours in town who find their water polluted. The new technology is an economic success, but only because it is an ecological failure." This implies that the system is wrong only because the additional nitrogen is, in large measure, reaching the wrong target. Yet there are good biological reasons, quite apart from losses through leaching, for recognising that the upward spiral of demand for higher yields, and disproportionately higher loads of fertiliser, is itself a road of rapidly diminishing returns that is ecologically unsound. Nitrate pollution may be an indicator of intrinsic inefficiency, but it does not unmask the underlying driving forces, rising demand through population growth, and economic pressures toward ultra-high yields that take no account whatever of ecological impacts like soil deterioration, biological limits, and the inherent dangers of monoculture.

True, Barry Commoner states the pesticide situation with greater penetration, and comes back to bite harder at the fertiliser problem. Pesticide use in the US increased 168 per cent per unit of agricultural production between 1950 and 1967. "By killing off natural predators of the target pest, which itself tends to become resistant, the new insecticides become increasingly inefficient. Increasing amounts must be used simply to maintain crop yield. For example, in Arizona insecticide use on cotton tripled between 1965 and 1967 with an appreciable drop in yield—an agricultural treadmill which forces us to move ever faster to keep in place. Again, the decreasing efficiency means an increasing release of pesticides into the environment where they become a threat to wildlife and man," says Commoner.

There is hardly a hint here of the incredible long-term risks implicit in low-level contamination of the entire biosphere through massive use of persistent pesticides, nor of the total absence at the outset of any attempt to evaluate risk or to question whether risk was justified. The "treadmills" of pesticides and fertilisers bring from Commoner grudging admiration for the business acumen of those who purvey them. It is as though, from time to time, Professor Commoner forgets the ecology he tries to teach us.

Yet he points firmly to the growing evidence that the heavy use of fertilisers reduces the natural populations of nitrogen-fixing bacteria and induces mutation to non-nitrogen fixing forms. Since these bacteria are fundamental to the process of growth their elimination destroys the natural process while leading to a higher demand for the synthetic substitute. As in the case of pesticides, which wipe out the natural insect populations needed for control, the user becomes hooked and the whole system degrades. Commoner points out that these products are, from the salesman's point of view, perfect. They wipe out natural competition and increase their own demand. He does not point out that they both are absurdly blunt instruments which, through the elimination of species, threaten the stability of ecosystems and can lead only to a reduced natural productivity.

But he gives great weight to the transition that has taken place during the past 40 years from the use of naturally produced materials to artificial materials. From an environmental point of view the difference of impact is striking. Natural fibres, including those manufactured from cellulose, belong to growth and decay cycles which are enclosed and complete. Man-made fibres, like detergents, do not. Quite apart from the high energy demands of the synthetics during manufacture, which has environmental impact of its own, the synthetics have no decay routes. "Every bit of synthetic fibre or polymer that has been produced on the earth is either destroyed by burning—and thereby pollutes the air—or accumulates as rubbish."

Pointing to the accumulation of plastic debris, not only on land and shore but in the bottom sediments of rivers and seas, Commoner sees their environmental impact as enormous and unpredictable. "It is sobering to contemplate the fate of the billions of pounds of plastic already produced" he comments bleakly, pointing out that the property which makes the man-made materials "superior" to the natural materials, is precisely the property which increases their environmental impact.

What Professor Commoner suggests is that by sorting technologies into ecologically "good" or "bad" categories, we might have a basis on which to make judgments, for social necessity can be weighed against environmental impact. "What is needed is a kind of 'ecological impact inventory' for each productive activity" he argues, for this would enable us to put a "pollution price tag" on each product. Then we would know, for example, in the case of a pound of detergent, just how much air pollution, fuel consumption, mercury pollution through chloride manufacture, water pollution, ecological effects of fluoride and arsenic (phosphate contaminants), and

It is not economic growth, nor affluence, nor increased population, causing the crisis, it is simply the nature of technological development.

again of mercury (as an alkali contaminant) were involved. Such an inventory would enable us to judge the relative *social value* of different products, and the implication here is that, for most cleaning purposes, we should return to vegetable-oil based soaps. The lack of such an inventory reveals "how blind we are about the environmental effects of modern technology."

In his search for flawed technology Commoner looks at the multiplicative relationship of population, affluence and technology in the prooduction of pollution and concludes that the technology factor—that is the increased output of pollutants per unit of production resulting from the introduction of new technologies since the 1940s—accounts for about 95 per cent of the massive rise in pollution in the US during the past three decades. The overall evidence seems clear, he says. "The economy has grown enough to give the United States population about the same amount of basic goods, per *capita*, as it did in 1946. However, productive technologies with intense impacts on the environment have displaced less destructive ones. The environmental crisis is the inevitable result of this counter-ecological pattern of growth."

In other words, it is not economic growth, nor affluence, nor increased population causing the crisis, it is simply the nature of technological development. This is a comforting conclusion for it implies that, with more thought and better social management, all can be put right. As an argument this has been voiced in Britain many times, most recently by Nature. Sadly, the argument is not only flawed but dangerously misleading.

Nobody will disagree with Barry Commoner's analysis of the general ecological situation. "What saved life from extinction," he says, "was the invention in the course of evolution of a new life form which reconverted the waste of the primitive organisms into fresh organic matter." The first photosynthetic organisms transformed the rapacious linear course of life into the earth's first great ecological cycle. By closing the circle, they achieved what no living organism alone can accomplish—survival. Human beings have broken out of the circle of life, driven not by biological need but by the social organisation which they have devised to "conquer" nature: means of gaining wealth that are governed by requirements conflicting with those of nature. The end result . . . is a crisis of survival. To survive we must once more close the circle. We must learn how to restore to nature the wealth that we borrow from it."

But it is one thing to argue that "if we are to survive, ecological considerations must guide economic and political ones" and quite another to reach the conclusion that 95 per cent of our ills stem simply from technological change. Commoner finds a cause for optimism in the complexity of the issues raised by the environmental crisis for, when we find the links between cause and effect, we can achieve essential changes. "Confronted separately, the need of developing nations for new productive enterprises, and the need of industrialised countries to reorganise theirs along ecologically sound lines, may seem hopelessly difficult." But, he argues, when the links between the two can be seen (the ecological significance of the massive introduction of synthetic for natural products) ways of solving the problems of both kinds of nations can be seen.

No one will disagree that the social organisation of man must be brought into harmony with natural systems, but it is quite wrong-headed to imply that by technological change alone a solution can be found for global problems. Indeed, to conclude that "affluence" and population increases account for only 5 per cent of the increase in pollution, or that by controlling pollution we can solve the crises, is desperately misleading.

In support of his notion that environmental deterioration is technological and recent, Professor Commoner says that all the while "human beings held their place in the terrestrial ecosystem—consuming food produced by the soil and oxygen released by plants, returning organic wastes to the soil and carbon dioxide to the plants—they could do no serious ecological harm." Yet, as Paul Ehrlich and John Holdren point out in their critical paper, only a few lines later Commoner cites erosion, deforestation, and destruction of fisheries as serious ecological problems "apparently unaware that he is contradicting himself." Far from starting in the 1940s, serious ecological damage has accompanied human activities since the development of agriculture, 10,000 years ago.

The lush granary of the Tigris and Euphrates valleys was converted to desert by salination through irrigation "a process that started more than two millennia before Christ, and was completed before Columbus sailed" say Ehrlich and Holdren. When water is distilled in the rain cycle there is no problem, but irrigation brings with it the destructive build up of salts in soil. The battle was lost in Mesopotamia, and *salinisation* is a growing problem today as more and more land is brought under irrigation to meet the demands of growing populations.

The technology may be flawed, but not in the sense employed by Barry Commoner, and not through recent substitution. Nor is the problem confined to developing countries where population pressures are highest. With the no less devastating fingerprint of mining—an indelible facet of "affluence"—it is evident in the US, Africa and every other region of the world exploited by man.

Even the most primitive soil-based form of agriculture, slash and burn, which depends on clearance, use, and abandonment for a period of recovery, winds down a spiral of decay as population pressure reduces the time available for land recovery, or as the areas cleared become large and therefore liable to erosion. These problems are basic, ecological, pre-industrial and geared to population growth. They are largely ignored by Barry Commoner.

Ehrlich and Holdren pull no punches, and it is perhaps a good thing that Barry Commoner subscribes so clearly to the precept contained in the quotation used at the beginning of this review. They say that in "The Closing Circle" Barry Commoner resorts to "biased selection of data, unconventional definitions, numerical sleight of hand, and bad ecology: only thus can he explain away the contributions of population growth and "increased affluence" to environmental deterioration. They also assert that Commoner has "misconceptions" about demography which lead him to draw erroneous conclusions about the self-regulation of human populations and about viable strategies for population limitations.

'Biased selection of data, unconventional definitions, numerical sleight of hand, and bad ecology' . . . Ehrlich.

The basic point that Ehrlich and Holdren are making is that in his book Barry Commoner looks at only the most superficial aspect of the environmental crisis and argues, almost optimistically, that on this basis a new technological revolution will be a cure-all. They show with straightforward algebra that Commoner's calculations of environmental impact falsely understate the components of affluence and population growth and that, in any case, the criteria used by Commoner to measure "affluence" falsely minimise the extent of environmental impact.

Although the arguments against Commoner are straightforward, they are both more sophisticated and more fundamental than any used by Commoner himself. It is convenient and comfortable to shift the blame for the human situation on to faulty technology and thus avoid the now desperate need to face the harsh problems of population control and redistribution of wealth. That is what Commoner has done. In doing so he distorts the real structure of the crisis in much the same way as those who, concerned about pollution, give great emphasis to an accidental spillage of a few tons of pesticide but somehow forget the thousands of tons which are annually poured into the environment, but whose effects are the real basis of crisis. Barry Commoner always deserves to be read and read carefully. But always remember that he is concerned with only a fragment of the problem, the fragment that is easiest to understand and perhaps also the easiest to deal with.