

**Aldous Huxley**

Between 1800 and 1900 the doctrine of Pie in the Sky gave place, in a majority of Western minds, to the doctrine of Pie on the Earth. The motivating and compensatory Future came to be regarded, not as a state of disembodied happiness, to be enjoyed by me and my friends after death, but as a condition of terrestrial well-being for my children or (if that seemed a bit too optimistic) my grandchildren, or maybe my great-grandchildren. The believers in Pie in the Sky consoled themselves for all their present miseries by the thought of posthumous bliss, and whenever they felt inclined to make other people more miserable than themselves (which was most of the time), they justified their crusades and persecutions by proclaiming, in St. Augustine's delicious phrase, that they were practicing a "benignant asperity," which would ensure the eternal welfare of souls through the destruction or torture of mere bodies in the inferior dimensions of space and time. In our days, the revolutionary believers in Pie on the Earth console themselves for their miseries by thinking of the wonderful time people will be having a hundred years from now, and then go on to justify wholesale liquidations and enslavements by pointing to the nobler, humane world which these atrocities will somehow or other call into existence. Not all the believers in Pie on the Earth are revolutionaries, just as not all believers in Pie in the Sky were persecutors. Those who think mainly of other people's future life tend to become proselytisers, crusaders and heresy hunters. Those who think mainly of their own future life become resigned. The preaching of Wesley and his followers had the effect of reconciling the first generations of industrial workers to their intolerable lot and helped to preserve England from the horrors of a full-blown political revolution.

Today the thought of their great-grandchildren's happiness in the twenty-first century consoles the disillusioned beneficiaries of progress and immunizes them against Communist propaganda. The writers of advertising copy are doing for this generation what the Methodists did for the victims of the first Industrial Revolution.

The literature of the Future and of that equivalent of the Future, the Remote, is enormous. By now the bibliography of Utopia must run into thousands of items. Moralists and political reformers, satirists and science fictioneers – all have contributed their quota to the stock of imaginary worlds. Less picturesque, but more enlightening, than these products of phantasy and idealistic zeal are the forecasts made by sober and well-informed men of science. Three very important prophetic works of this kind have appeared within the last two or three years—The Challenge of Man's Future by Harrison Brown, The Foreseeable Future by Sir George Thomson, and The Next Million Years by Sir Charles Darwin. Sir George and Sir Charles are physicists and Mr. Brown is a distinguished chemist. Still more important, each of the three is something more and better than a specialist.

Let us begin with the longest look into the future—The Next Million Years. Paradoxically enough, it is easier, in some ways, to guess what is going to happen in the course of ten

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thousand centuries than to guess what is going to happen in the course of one century. Why is it that no fortune tellers are millionaires and that no insurance companies go bankrupt? Their business is the same – foreseeing the future. But whereas the members of one group succeed all the time, the members of the other group succeed, if at all, only occasionally. The reason is simple. Insurance companies deal with statistical averages. Fortune tellers are concerned with particular cases. One can predict with a high degree of precision what is going to happen in regard to very large numbers of things or people. To predict what is going to happen to any particular thing or person is for most of us quite impossible and even for the specially gifted minority, exceedingly difficult. The history of the next century involves very large numbers; consequently it is possible to make certain predictions about it with a fairly high degree of certainty. But though we can pretty confidently say that there will be revolutions, battles, massacres, hurricanes, droughts, floods, bumper crops and bad harvests, we cannot specify the dates of these events nor the exact locations, nor their immediate, short-range consequences. But when we take the longer view and consider the much greater numbers involved in the history of the next ten thousand centuries, we find that these ups and downs of human and natural happenings tend to cancel out, so that it becomes possible to plot a curve representing the average of future history, the mean between ages of creativity and ages of decadence, between propitious and unpropitious circumstances, between fluctuating triumph and disaster. This is the actuarial approach to prophecy – sound on the large scale and reliable on the average. It is the kind of approach which permits the prophet to say that there will be dark handsome men in the lives of x per cent of women, but not which particular woman will succumb.

A domesticated animal is an animal which has a master who is in a position to teach it tricks, to sterilize it or compel it to breed as he sees fit. Human beings have no masters. Even in his most highly civilized state, Man is a wild species, breeding at random and always propagating his kind to the limit of available food supplies. The amount of available food may be increased by the opening up of new land, by the sudden disappearance, owing to famine, disease or war, of a considerable fraction of the population, or by improvements in agriculture. At any given period of history there is a practical limit to the food supply currently available. Moreover, natural processes and the size of the planet being what they are, there is an absolute limit, which can never be passed. Being a wild species, Man will always tend to breed up to the limits of the moment. Consequently very many members of the species must always live on the verge of starvation. This has happened in the past, is happening at the present time, when about sixteen hundred millions of men, women and children are more or less seriously undernourished, and will go on happening for the next million years – by which time we may expect that the species Homo sapiens will have turned into some other species, unpredictably unlike ourselves but still, of course, subject to the laws governing the lives of wild animals.

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We may not appreciate the fact; but a fact nevertheless it remains: we are living in a Golden Age, the most gilded Golden Age of human history – not only of past history, but of future history. For, as Sir Charles Darwin and many others before him have pointed out, we are living like drunken sailors, like the irresponsible heirs of a millionaire uncle. At an ever accelerating rate we are now squandering the capital of metallic ores and fossil fuels accumulated in the earth's crust during hundreds of millions of years. How long can this spending spree go on? Estimates vary. But all are agreed that within a few centuries or at most a few millennia, Man will have run through his capital and will be compelled to live, for the remaining nine thousand nine hundred and seventy or eighty centuries of his career as Homo sapiens, strictly on income. Sir Charles is of the opinion that Man will successfully make the transition from rich ores to poor ores and even sea water, from coal, oil, uranium and thorium to solar energy and alcohol derived from plants. About as much energy as is now available can be derived from the new sources – but with a far greater expense in man hours, a much larger capital investment in machinery. And the same holds true of the raw materials on which industrial civilization depends. By doing a great deal more work than they are doing now, men will contrive to extract the diluted dregs of the planet's metallic wealth or will fabricate non-metallic substitutes for the elements they have completely used up. In such an event, some human beings will still live fairly well, but not in the style to which we, the squanderers of planetary capital, are accustomed.

Mr. Harrison Brown has his doubts about the ability of the human race to make the transition to new and less concentrated sources of energy and raw materials. As he sees it, there are three possibilities. "The first and by far the most likely pattern is a return to agrarian existence." This return, says Mr. Brown, will almost certainly take place unless Man is able not only to make the technological transition to new energy sources and new raw materials, but also to abolish war and at the same time stabilize his population. Sir Charles, incidentally, is convinced that Man will never succeed in stabilizing his population. Birth control may be practiced here and there for brief periods. But any nation which limits its population will ultimately be crowded out by nations which have not limited theirs. Moreover, by reducing cut-throat competition within the society which practices it, birth control restricts the action of natural selection. But wherever natural selection is not allowed free play, biological degeneration rapidly sets in. And then there are the short-range, practical difficulties. The rulers of sovereign states have never been able to agree on a common policy in relation to economics, to disarmament, to civil liberties. Is it likely, is it even conceivable, that they will agree on a common policy in relation to the much more ticklish matter of birth control? The answer would seem to be in the negative. And if, by a miracle, they should agree, or if a world government should someday come into existence, how could a policy of birth control be enforced? Answer: only by totalitarian methods and, even so, pretty ineffectively.

Let us return to Mr. Brown and the second of his alternative futures. "There is a possibility," he writes, "that stabilization of population can be achieved, that war can be

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avoided, and that the resource transition can be successfully negotiated. In that event mankind will be confronted with a pattern which looms on the horizon of events as the second most likely possibility – the completely controlled, collectivized industrial society.” (Such a future society was described in my own fictional essay in Utopianism, Brave New World.)

The third possibility confronting mankind is that of a world-wide free industrial society, in which human beings can live in reasonable harmony with their environment.” This is a cheering prospect; but Mr. Brown quickly chills our optimism by adding that “it is unlikely that such a pattern can exist for long. It certainly will be difficult to achieve, and it clearly will be difficult to maintain once it is established.”

From these rather dismal speculations about the remoter future it is a relief to turn to Sir George Thomson’s prophetic view of what remains of the present Golden Age. So far as easily available power and raw materials are concerned, Western man never had it so good as he has it now and, unless he should choose in the interval to wipe himself out, as he will go on having it for the next three, or five, or perhaps even ten generations. Between the present and the year 2050, when the population of the planet will be at least five billions and perhaps as much as eight billions, atomic power will be added to the power derived from coal, oil and falling water, and Man will dispose of more mechanical slaves than ever before. He will fly at three times the speed of sound, he will travel at seventy knots in submarine liners, he will solve hitherto insoluble problems by means of electronic thinking machines. High-grade metallic ores will still be plentiful, and research in physics and chemistry will teach men how to use them more effectively and will provide at the same time a host of new synthetic materials. Meanwhile the biologists will not be idle. Various algae, bacteria and fungi will be domesticated, selectively bred and set to work to produce various kinds of food and to perform feats of chemical synthesis, which would otherwise be prohibitively expensive. More picturesquely (for Sir George is a man of imagination), new breeds of monkeys will be developed, capable of performing the more troublesome kinds of agricultural work, such as picking fruit, cotton and coffee. Electron beams will be directed onto particular areas of plant and animal chromosomes and, in this way, it may become possible to produce controlled mutations. In the field of medicine, cancer may finally be prevented, while senility (“the whole business of old age is odd and little understood”) may be postponed, perhaps almost indefinitely. “Success,” adds Sir George, “will come, when it does, from some quite unexpected directions; some discovery in physiology will alter present ideas as to how and why cells grow and divide in the healthy body, and with the right fundamental knowledge, enlightenment will come. It is only the rather easy superficial problems that can be solved by working on them directly; others depend on still undiscovered fundamental knowledge and are hopeless till this has been acquired.”

All in all, the prospects for the industrialized minority of mankind are, in the short run, remarkably bright. provided we refrain from the suicide of war, we can look forward to very good times indeed. That we shall be discontented with our good time goes without

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saying. Every gain made by individuals or societies is almost instantly taken for granted. The luminous ceiling toward which we raise our longing eyes becomes, when we have climbed to the next floor, a stretch of disregarded linoleum beneath our feet. But the right to disillusionment is as fundamental as any other in the catalogue. (Actually the right to the pursuit of happiness is nothing else than the right to disillusionment phrased in another way.)

Turning now from the industrialized minority to that vast majority inhabiting the underdeveloped countries, the immediate prospects are much less reassuring. Population in these countries is increasing by more than twenty millions a year and in Asia at least, according to the best recent estimates, the production of food per head is now ten per cent less than it used to be in 1938. In India the average diet provides about two thousand calories a day -far below the optimum figure. If the country's food production could be raised by forty per cent – and the experts believe that, given much effort and a very large capital investment, it could be increased to this extent within fifteen or twenty years – the available food would provide the present population with twenty-eight hundred calories a day, a figure still below the optimum level. But twenty years from now the population of India will have increased by something like one hundred millions, and the additional food, produced with so much effort and at such great expense, will add little more than a hundred calories to the present woefully inadequate diet. And meanwhile it is not at all probable that a forty per cent increase in food production will in fact be achieved within the next twenty years.

The task of industrializing the underdeveloped countries, and of making them capable of producing enough food for their peoples, is difficult in the extreme. The industrialization of the West was made possible by a series of historical accidents. The inventions which launched the Industrial Revolution were made at precisely the right moment. Huge areas of empty land in America and Australia were being opened up by European colonists or their descendants. A great surplus of cheap food became available, and it was upon this surplus that the peasants and farm laborers, who migrated to the towns and became factory hands, were enabled to live and multiply their kind. Today there are no empty lands – at any rate none that lend themselves to easy cultivation – and the over-all surplus of food is small in relation to present populations. If a million Asiatic peasants are taken off the land and set to work in factories, who will produce the food which their labor once provided? The obvious answer is: machines. But how can the million new factory workers make the necessary machines if, in the meanwhile, they are not fed? Until they make the machines, they cannot be fed from the land they once cultivated; and there are no surpluses of cheap food from other, emptier countries to support them in the interval.

And then there is the question of capital. "Science," you often hear it said, "will solve all our problems." Perhaps it will, perhaps it won't. But before science can start solving any practical problems, it must be applied in the form of usable technology. But to apply science on any large scale is extremely expensive. An underdeveloped country cannot



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be industrialized, or given an efficient agriculture, except by the investment of a very large amount of capital. And what is capital? It is what is left over when the primary needs of a society have been satisfied. In most of Asia the primary needs of most of the population are never satisfied; consequently almost nothing is left over. Indians can save about one hundredth of their per capita income. Americans can save between one tenth and one sixth of what they make. Since the income of Americans is much higher than that of Indians, the amount of available capital in the United States is about seventy times as great as the amount of available capital in India. To those who have shall be given and from those who have not shall be taken away even that which they have. If the underdeveloped countries are to be industrialized, even partially, and made self-supporting in the matter of food, it will be necessary to establish a vast international Marshall Plan providing subsidies in grain, money, machinery, and trained manpower. But all these will be of no avail, if the population in the various underdeveloped areas is permitted to increase at anything like the present rate. Unless the population of Asia can be stabilized, all attempts at industrialization will be doomed to failure and the last state of all concerned will be far worse than the first – for there will be many more people for famine and pestilence to destroy, together with much more political discontent, bloodier revolutions and more abominable tyrannies. (From Tomorrow and Tomorrow and Tomorrow)

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