The World's Future, Aldous Huxley

The World's Future

Before beginning on any series of forecasts, I think it is worthwhile to say a few words about man's different conceptions of the future. Most of us do not realize that our view of the future is a fairly recent phenomenon or that the ways the future has been looked at by people both within and outside our tradition are very different from the way in which we look at it. The Indians have a cyclical idea of time—the notion that there is an eternal recurrence and that time repeats the same pattern over and over again. According to the Indian idea, we are now at the last phase of one of the great cycles, in the Kali Yuga, the Age of Iron. We have been in it for about two thousand years, and apparently there are about thirty-five thousand years more to go, during which things will get worse and worse all the time—we 'ain't seen nothing yet', according to the Indians. After that, there will be a general explosion, and we may then, after several million years, start again on an Age of Gold. A similar view of time was taken by the ancient Greeks: there was a great year which repeated itself continuously.

Our present view of the future is entirely different. The notion of an eternal recurrence, which as late as Nietzsche was preached by some philosophers, has really gone out of the picture altogether. We think of time not as going round and round, but as moving irreversibly in one direction. The whole idea is expressed in the scientific notion of increasing entropy: we are continually moving in one direction, and life is a temporary reversal of entropy within the larger system.

In the Christian tradition, instead of eternal recurrence there was the idea of a definite creation in time (according to Bishop Usher, in 4004 b.c.) and a definite ending, which would take place probably very soon—and hence, a complete lack of interest in the future. This is how Professor J. B. Bury, who has written perhaps the most interesting book on the subject, sums up the Christian idea: 'According to the Christian theory, which was worked out by the Church Fathers, and especially by St Augustine, the whole movement of history has the purpose of assuring the happiness of a small portion of the human race in another world. It does not postulate a further development of human history on earth.'

We have also changed very much in relation to this Christian tradition. One can say that the early Christian notion of the future, in so far as it was a happier and progressive future, was a notion of what is vulgarly called 'pie in the sky'. This changed profoundly during the eighteenth and nineteenth centuries to a new conception of what might be called 'pie on the earth'—the idea of a world improving through indefinite periods of time. This idea of a progress, which some thinkers regarded as absolutely inevitable while others regarded it as conditional, but which in any case goes forward and may be expected to reach a pitch of perfection in a distant time, replaces the ancient idea of an Age of Gold in the past with either a sudden fall (as within the Christian tradition) or a gradual deterioration (as within the Oriental traditions).

Just as in the past the old conception of 'pie in the sky' justified both resignation to an intolerable lot upon earth and persecution, so in exactly the same way this idea of 'pie on the earth' has fostered both resignation and persecution. Under the old dispensation, it was right, in St Augustine's delicious phrase, to use 'benignant asperity' towards heretics in order to safeguard their eternal bliss in the next world. To

destroy them in this world was as nothing compared to the good you were doing them by saving them in eternal life. In the same way, we see in the modern world the most appalling persecutions and liquidations going on, not in the name of Heaven, but in the name of the extraordinarily good time which our great-grandchildren will have in the twenty-second century. The idea is that if we liquidate enough people now, then there will be this magnificent time two hundred years from now which will go on forever, getting better and better. People used to compensate themselves for the miseries of life in this world by reflecting on life in the world to come; this same resignation to present misery is found today among people who reflect about the much better times that are coming in the future upon earth.

The compensatory idea of a better life in heaven has played an enormous part in the social life of the world. Historians agree that the Wesleyan movement in the eighteenth century was instrumental in guaranteeing England against a violent revolution. The intolerable conditions created in the first generations of the industrial revolution were made tolerable to the labouring masses, who were living in conditions of indescribable wretchedness, by this ardent preaching of the happiness which was going to be theirs after death. In the same way there seems to have been a real feeling during the nineteenth century, among the oppressed and the miserable, that this wonderful good time which was going to come on earth in two or three centuries was in some way a compensation for the miseries being suffered in the present. We have some very interesting literary expressions of this idea from the nineteenth century. One of the first is to be found in Tennyson's poem 'Locksley Hall', which was published in 1842. This is a very curious poem. The hero is a young man who has been bitterly disappointed in love and who consoles himself not with philosophy, and not with religion, but by reflecting on the march of progress and on the wonderful things which will happen in the future. He talks about the increase of knowledge and of virtue and finally about the parliament of man, the federation of the world.

A few years later, in the same year as the publication of the Origin of Species, you find Victor Hugo, in France, talking even more lyrically about progress and what it means to man. He has the most fantastic passage where he speaks of man sailing in a kind of magic ship through the ether. The ship is the calculus of Newton mounted upon the odes of Pindar—a mixture of inspiration and science—and man is sailing clothed in light into the pure and divine future, into virtue, into shining knowledge, into the end of plague and disaster, into abundance, into calm and laughter and happiness, into union with heaven. This goes on for hundreds of lines. It clearly was Victor Hugo's brand of religion, and perhaps a majority of the great literary figures of the nineteenth century felt rather the same way.

There are, however, a few exceptions. You will find in Alfred de Vigny, for example, an extremely sceptical reaction to the first railroads. He was by no means convinced, as Victor Hugo and the French historian Jules Michelet were, that railroads were going to transport the human race into universal peace and universal virtue. On the contrary, he spoke of the potential danger of new machinery to man, the danger that the machinery might actually enslave its creator. It is interesting to see this dark picture appearing just at the time when there was the most unbounded optimism in regard to technical progress.

Outside the world of literature, you find these same ideas very strongly expressed at the time of the first of the universal exhibitions, the Great Exhibition of 1851 in London. This was opened by the prince consort

on 1 May 1851; he spoke of it as the realization of the unity of mankind. In the staid columns of the London Times there were equally enthusiastic editorials which said the Exhibition foreshadowed universal peace, that this 1 May was the first morning since the Creation in which all the peoples had assembled from all parts of the world to perform a common act.

This tremendous enthusiasm did infect almost everybody, but it is interesting to find that the new religion of progress was regarded at the time by the guardians of Christian orthodoxy as extremely dangerous and heretical. In the Syllabus of Errors, published in 1864, Pope Pius IX lists as one of the grave errors (which must be pointed out and condemned) the idea that the Roman Pontiff should come to terms with, and reconcile himself to, progress, liberalism, and modern civilization. This was definitely a heresy which must not be accepted. Thus we see the incompatibility between the new view of time and of human development on earth, and the traditional Augustinian view of time on earth as quite unimportant, with future betterment existing only for a few and in another world.

In 1859 we come to the crucial year of the publication of the Origin of Species, which introduced the new scientific conception of the world as an evolutionary world which began in the immensely distant past and, without any breach of continuity at all between the lower forms and the highest human forms, will go on indefinitely into the future. The evolutionary theory as such is neither optimistic nor pessimistic, but it can be interpreted either way. There have been progressive movements within evolution—it is absurd to say that a human being is not superior to an amoeba. He clearly is superior. At the same time, however, it is quite clear that the evolutionary process has not been progressive along all lines; many have become extinct or completely stagnant, and the world today is full of what might be called living fossils.

Therefore, although there has been quite clearly a line of progress within the line of evolution, it cannot be said that the theory of evolution, when applied specifically to human beings, justifies neither pessimism nor optimism.

The prevailing interpretation in the latter half of the nineteenth century was optimistic. There were pessimists, such as Eduard von Hartmann, but they were much less influential than someone like Herbert Spencer, who developed a most elaborate and essentially optimistic evolutionary philosophy. The inevitability of progress seemed almost self-evident to Spencer; he regarded it as a law of equal validity with Newton’s law of gravitation. (Unfortunately, his whole theory assumed as its basis the inheritance of acquired characteristics, which we now have every reason for believing to be untrue.) There is no question that Herbert Spencer did exercise a prodigious influence in the second half of the nineteenth century, and that there was generally an extremely optimistic view of the future, a belief that progress was happening all the time and would almost certainly go on happening. I remember the golden glow of this optimistic theory when I was a child, the notion that we, who were fortunate enough to live in the more civilized parts of the world, were really incapable of doing the sorts of things that people had done in the remote past or that people were doing in the uncivilized parts of the world.

If somebody had asked me as a child, or my parents, if they thought that within my lifetime we should see large-scale revival of slavery, of torture, of persecution for heretical opinions, of mass deportations, we

would have said, ‘It is absolutely impossible!’ Nevertheless, we have seen these dreadful things, and our hope in regard to the inevitability of progress has been very much shaken. We are convinced that we live in a world of incessant change, but we are not at all convinced now that this change must necessarily be in the direction which our system of values would regard as excellent. If we use enough intelligence and goodwill, we probably can achieve a high degree of progress, but it is up to us to see that this happens, and there is nothing in the processes of change themselves which is going to compel it to happen.

This tempered optimism is the most prominent view of the future, but another interesting fact is that with the coming of the hydrogen bomb human technology has reintroduced into the thinking of the West the old eschatological idea of the end of the world. The sudden and catastrophic ending of the world about which the Apocalyptic literature talks—a notion we had come to regard as untenable and absurd—has become once more a real possibility. Again, whether there shall be an indefinite future or whether there shall not is up to us.

Let us now consider, from our present viewpoint, what is likely to happen in the future. We begin with the very long-range view taken about four or five years ago by Sir Charles Darwin, the grandson of the naturalist, who is himself a physicist, in an interesting little book called The Next Million Years. It would seem at first glance that it is quite impossible to foresee what is likely to happen within a million years; and yet, in a certain paradoxical way, it is easier to make prophecies about very long spans of time than about shorter ones. The reason is quite obvious. When we deal with great spans of time we deal with huge numbers, and the average behaviour of great numbers of things or persons or events is more predictable than the behaviour of small numbers or of individual events. We see evidence for this everywhere around us.

No fortune teller of our acquaintance has ever made a fortune by telling fortunes, but no insurance company has ever gone bankrupt. The reason is that the insurance company foretells the future for millions, and therefore can always be sure of making a profit, whereas the fortune teller tells a fortune for only one person and is likely to be much more often wrong than right. The same is true in regard to forecasts over great periods of time. The ups and downs tend to level themselves out and a general line may perhaps be projected into the future.

Sir Charles Darwin’s view is simply that man is a wild species—he has not been domesticated. A domestic animal is one which has a master who teaches it tricks and controls its breeding, either by sterilizing it or crossing it with certain definite types, and therefore makes sure that future generations follow a particular pattern. But man has no master, and even his attempts at self-domestication are doomed to frustration inasmuch as the ruling minority which does the domestication itself remains a wild species. For this reason, in Darwin’s opinion, man will never transcend the limitations imposed upon a wild species.

Whatever may happen in short periods of history, in the long run the human species, like all other wild species, will live up to the very limits of its food supply with a large proportion in a state of semi-starvation all the time. This will go on, with ups and downs, Golden Ages and Iron Ages, during the ten thousand centuries he is envisaging. After a million years we may expect the species either to be extinct or to have evolved into quite a different species.

This is rather a gloomy point of view, and I don't think it is entirely justified. Sir Charles Darwin does not give credit to the human race for the extraordinary amount of ingenuity it has and its ability to get out of the extremely tight corners which it gets itself into, and perhaps he does not give credit to the human race for its exceptional toughness. The human species is probably the toughest species of all animals. It can exist in every conceivable kind of environment, and it can stand the most appalling strains and stresses, apparently better than almost any other species. Therefore, it may be that this long-range view, which has certain philosophical justifications, may prove to be wrong, owing to the remarkable capacity of man to spring surprises.

Meanwhile, we have to consider the short range, which is more interesting to us. What are our short-range prospects? Let us begin with the military and political prospects immediately confronting us. These were discussed a few years ago by Bertrand Russell, and it seems to me that his conclusions are extremely realistic and sensible. He says that there are three possibilities. First of all, if we get into a nuclear war, there is the possibility of the complete extinction of the species—and perhaps of all life upon earth if the nuclear war is sufficiently prolonged and waged with sufficiently deadly weapons. This is improbable, however, in the present state of technology.

The second possibility is that the nuclear war would result in a return to barbarism. Under present circumstances, this second alternative seems to have a good deal of probability, for the reason that a complex industrial system such as we depend upon now has very close analogies to an ecological system in nature. In nature, if we disturb one element in an ecological system, we throw the entire system out of gear. Analogously, if we were to destroy pretty thoroughly even one or a few elements in the complex industrial system, and if there were to be, for any reason, high mortality among the specially trained personnel on whom we depend for the functioning of the system, then it seems extremely probable that the whole industrial system would break down—it would be virtually impossible to run without one or another part of it—and the result would probably be a return of barbarism.

For what we must remember is that the present enormous populations of the world are enabled to live solely in virtue of possessing this very complicated industrial and communications system. If it were to break down, enormous numbers of people would probably die of starvation and the survivors would naturally indulge in civil wars in order to get the few resources remaining. The very great number of deaths immediately following the explosion of the H-bomb would thus be followed by an even greater number of deaths and an immense chaos.

It would also be extremely difficult ever to rebuild the system because, after a serious atomic war, mankind would not start from scratch, it would start several hundred years behind scratch. When the system was originally built, with rather primitive machinery and tools, resources were plentiful. Metallic ores were extremely rich and quite easy to get at. Today, after one hundred and fifty years of exploitation, this is not at all true. It would be very difficult for any people which had been reduced to a primitive level to rebuild a complex civilization on the basis of the rather impoverished resources left, particularly in those countries which have been highly developed up to now. You would have the paradox that it would be easier to rebuild an industrial civilization in those parts of the world which had not been previously industrialized and more difficult to rebuild it in those parts of the world which had been

previously industrialized and which had greatly reduced their resources of ores.

The third alternative which Lord Russell looks forward to is the creation of a single world state, which could occur in one of two ways: by force, as the result of one power being victorious in a nuclear war—that is to say, if one power could ever be victorious—which in fact is the way that previous empires have always been built up; or under the threat of force, under the fear of what might happen, and as the result of reason and considered enlightened self-interest and humane ideals. This, naturally, would be the desirable way of creating what Wendell Willkie called 'one world'; but it must be confessed that the historical precedents are not very encouraging. Take the case of Italy. From the time of Dante onward, every intelligent Italian saw that it was absolutely essential to have a united Italy, but Italy was not in fact united until 1870, and then it was united only by military force, by the Piedmontese.

And to this day you can meet Italians in Southern Italy or Sicilians who will speak rather bitterly of the time when the Piedmontese descended upon Italy and forcibly drew it together into a single country. The same thing is true of Germany. The final unification of Germany came after the Franco-Prussian war and was essentially an act of force. One sees the same thing in the building up of a unified France through the use of force and cunning by Richelieu in the seventeenth century. If there is a unification by conquest in the future I would say that, should the West win, we should see a kind of very superior, up-to-date Roman Empire as it was at the time of the Antonines; if the East should win, we would see a very much more unpleasant kind of empire, in which Western people would find themselves living on the wrong side of the tracks and thoroughly discriminated against.

Can we expect the coming together of the nations into a single world government, which is obviously infinitely desirable? And can we expect it to happen by democratic means? Can one expect a course of action which is manifestly good for everybody in the long run, but which in the short run causes discomfort or even suffering to a good many people, to be taken by a democratic society in time of peace? It seems to me rather dubious that this should be the case because there are enormous vested interests involved—and not merely the vested interests of the rulers, although rulers of a sovereign state do not wish to become merely officials in a province.

Similarly, the owners of factories do not want to subordinate the interests which flourish under a tariff system or to subordinate themselves to the interests of a much larger unit outside the present borders of the country, where there will be more efficient factories which will throw their own out of business. There are the vested interests of many workers, who might be displaced from their work or thrown out of employment altogether and forced to migrate to other parts of the country. There are also the vested interests of intellectuals, who don't wish to change their ideas, and indeed the vested interests of everybody—no one wants to alter the conditioning which he has had in childhood.

In general, one can say that it is only when human beings are threatened by somebody else that they are ready to unite and to accept short-range privations for long-range goods; they are ready to unite under the threat of war and catastrophe. Undoubtedly, the best thing for world government under law would be an invasion from Mars. Unfortunately, this is rather unlikely to take place. But is it possible to persuade ourselves that

after all human beings are their own Martians, that with over-population and over-organization and over-technicalization, we are committing immense aggressions against ourselves? Can we unite against ourselves for our own higher interest? It might be possible, by suitable education and propaganda, to put this view across, that what we regard as a piping time of peace is not, in fact, a piping time of peace, but that there is a real threat overhanging us all the time against which it is enormously in our interest to unite. This is rather remote speculation, but it is possible that some such argument might finally persuade people to take the step of getting together and forming a government in which all should live together under law.

These seem to be the immediate military and political possibilities in front of us. Now we have briefly to consider the technical and industrial prospects. Here the problem is one of resources. For those who wish to know more about this, I would advise them to read Harrison Brown's Challenge of Man's Future and Brown, Weir, and Bonner's book, The Next Hundred Years, where all the figures are given. When one considers that the amount of planetary capital consumed by the United States since the end of the First World War is greater than the entire amount of metals, fuels, and minerals consumed by the entire human race before that, one realizes what a fantastic drain upon resources is now going on. In order to carry on our present civilization, we require 1000 pounds of steel per head per annum, 23 pounds of copper, 26 pounds of lead, 3.5 tons of stone, gravel, and sand, 500 pounds of cement, 400 pounds of clay, 200 pounds of salt, 100 pounds of phosphate rock—in all, about 20 tons; and then, added to this, each member of the population requires the equivalent of 8 tons of coal to provide energy for him per year.

One sees that the amount of resources which is being used in the modern technical civilization is incredibly great. One of the consequences, as I hinted before, is that the easily accessible rich ores have to a large extent been exhausted. Fifty years ago a good copper ore contained 5 per cent of copper; today, ores are being worked with hardly more than 0.5 per cent of copper. And this is certainly going to continue. We are going to have to work poorer and poorer ores until finally we are exploiting granite and sea water to get the metals and minerals that we require. Theoretically this can perfectly well be done, and even in practice one can see how it could be done, but it will undoubtedly require far more work to get our raw materials than we put into it now, and it will entail an immense mechanization far beyond anything that we envisage today.

How long will our planetary resources last? The estimates vary greatly, from a few hundred years to a few thousand, but it is quite clear that sooner or later the richer ores will be exhausted.

Here Dr Harrison Brown has posed a question: What likelihood is there of man's being able to make the transition from an industrial life based upon rich ores to an industrial life based upon the poorest ores, a transition that will require an incredible amount of ingenuity and skill? Dr Brown, like Bertrand Russell, offers three alternatives. One is that we will succeed in making the transition, but that we shall then have a world-wide industrial civilization completely controlled by a totalitarian authority. The second possibility is that the transition will be made and that we shall then have a world-wide free industrial society devoted to the full development of human beings; but this alternative, while obviously the most desirable, is extremely difficult both to achieve and to maintain. The third possibility, which Dr Brown thinks the most probable of the three, is that within the next thousand

years or so, provided we escape war, we shall find ourselves gradually reverting to the agrarian state.

Let us consider now some of the more immediate possibilities and prospects in front of us. We begin with biochemistry, where such great authorities as Albert Szent-Györgyi are convinced that means will be found for controlling population, thus stabilizing world conditions and making some kind of reasonable development possible. He leaves out of account that the problem is not merely biochemical but sociological, psychological, philosophical, and religious, though on the biochemical level at least, I think we can look forward to such developments. In regard to food production, there seems to be no doubt that this can be enormously increased by the development of new varieties of plants through directed mutation, by the creation and domestication of various types of bacteria and fungi for producing different kinds of edible substances, and by new methods of finding water. Stephen Riess is working on methods of finding what has been called 'juvenile water', thus making possible the irrigation of vast areas which at present are completely barren. It seems fairly clear that if we can stabilize the population, it should be possible to feed it at an adequate level—although, inasmuch as the meat diet is extremely wasteful, probably with a vegetarian diet.

There will also certainly be advances in chemistry. I expect one of the most important will spring from basic research in photosynthesis, in the field of what may be called radiation chemistry. It will certainly be found that an enormous number of chemical processes can take place in controlled radiation—not merely in sunlight, but in the harder radiations possible now that we have large atomic piles. Quite unprecedented kinds of chemical synthesis will become possible.

Incidentally, all this will happen entirely as a result of basic research, not ad hoc research. We still tend to be obsessed with doing research to solve a particular problem, but the basic discoveries come only as a result of basic research. I read the other day a very amusing remark by Dr Szent-Györgyi about the nature of basic research. He said,

When I first came to this country ten years ago, I had the greatest difficulty to find means for my basic research. People asked me, what are you doing, what is it good for? I had to say, it is no good at all. Then they asked, then exactly what are you going to do? I had to answer, I don't know, that is why it is research. So the next question was, how do you expect us to waste money on you when you don't know what you do or why you do it? This question I could not answer.

Such questions are not asked as often any more. All the same, there is plenty of room for improvement.

From the biological and chemical worlds, let us pass to the human world. In the field of psychopharmacology we shall probably see extraordinary developments as the result of research in basic metabolism, with the creation of a better environment for the central nervous system and the consequent elimination of a great many mental disorders and psychophysical diseases. We may also see the kind of scientific application which the eminent geneticist Professor Hermann Muller speaks about—the application of eugenic methods to the improvement of the human stock. Muller speculates about what he calls 'foster parenthood' and the possibility of the creation of a new kind of morality, by which people would think it more important to bear children who were the best possible in the field of nature rather than children who exactly reproduce their parents' idiosyncrasies and weaknesses.

This would be possible through foster parenthood of children conceived by the union of reproductive cells derived from stocks representing the parents' highest ideal. Sooner or later eugenics will be practised, although it is certainly going to take a tremendous revolution in our present ethical ideas on the subject. It may be added that the first nation that does practise such eugenic methods as Professor Muller advocates will in a few decades be enormously superior to all its rivals—which seems to me yet another reason why we should, as quickly as possible, by hook or by crook, achieve the 'one world' ideal; in the context of nationalism eugenics could become an instrument of extraordinary power and extraordinary danger.

Then we come to purely psychological processes. Psychology is, quite obviously, still in its infancy, and we can foresee remarkable developments. It may become possible within two or three generations to understand the processes of creative thinking, to find out how these processes can be systematized, how they can be taught, how human beings can be educated so as to live to the height of their potential instead of using only a small part of their capacity. Such purely psychological advances, added to those in the field of psychopharmacology, will probably greatly improve the performance of human beings. If these are conjoined with eugenic procedures, we can foresee with considerable confidence a remarkable improvement in the human creature. What Emerson said long ago, that all men plume themselves on the improvement of society but no man improves, will cease to be true. It may even be possible now to get men to improve and thus to improve society. Though no one knows whether this will be accomplished or not, we are perfectly justified in saying that it can be accomplished now.

Let us very briefly talk about mechanical advances. Probably the most important of these will be connected with the great electronic computing machines, which will enable us to perform feats of thinking and problem-solving of which we were never capable before, and which will, therefore, open up to rational action areas in which it was quite impossible in the past. It may be possible even to conceive of making rational policy decisions—knowing what all the possibilities in a field are and choosing the best. Such decisions have been left entirely to the intuition of politicians in the past, but they now may come under the control of fact and of reason based upon fact.

I was reading just the other day in a recent number of Harper's magazine about a fascinating new electronic device used for doing research in the back numbers of scientific periodicals. This is an appalling job at present; there are many thousands of papers published every year, there is a backlog of literally millions of them, and it is incredibly difficult to discover what has, in fact, been done in this jungle of material. Now a machine has been developed into which you can put magnetic tape to which the subject matter of the papers has been transferred, and in a very short time the machine will tell you where you can find out what you wish.

And we mustn't forget our friends the Sputniks and satellites. These will be exceedingly useful, not so much in regard to outer space as in regard to the earth. They will give us extremely good information about weather. (I was appalled to read a statement from Dr Werner von Braun the other day saying that satellites will be sent up and a number of them connected together by radio into a kind of electric relay which will permit TV programmes to be globally transmitted at any moment. This is a grave menace, but there it is!)

In conclusion, it seems quite clear that enormous possibilities lie open to us, that we are on the threshold of profound discoveries within our own nature and in external nature. If we can solve the basic political and demographic problems, we could produce a world of the most incalculably superior nature. Whether we shall do so or not, I don't know, but it is very important to realize that the immediate future is probably immensely important in regard to these possibilities. Harrison Brown has summed it up by saying that the next hundred years will undoubtedly prove to be more critical than any that mankind as a whole has been called upon to face. This is a very sobering prospect, but I think it is perfectly true.

More than fifty years ago Tolstoy said that in a society which is badly organized, as ours is, where a small minority rules over the majority, every scientific advance and conquest of nature strengthens the hand of the minority against the majority. It is up to us to decide now whether these conquests of nature and accessions of knowledge are to be used for frightful and inhuman ends, or whether they are to be used to create the kind of progress of which we have dreamed—and, indeed, the kind of progress of which nobody has ever dreamed, because the potentialities which are now opening up before us have never been present in the history of the world before.

The End