Man and His Planet, Aldous Huxley

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What is our relationship with the planet? What are we doing with the world on which we are living and how are we treating it? How is it likely to treat us if we go on treating it as we are now?

I shall begin to answer these questions with two quotations from the Bible. The first comes from the Psalms: 'The trees of the Lord are full of sap: the cedars of Lebanon, which he hath planted' (Psalms 104: 16). The second comes from the Song of Solomon, where the face of the beloved is compared to the cedars: 'His countenance is as Lebanon, excellent as the cedars' (Song of Solomon 5: 15). These great trees have a kind of mythical quality. We have all heard of them from our earliest years; hospitals are named after them, and they have become a sort of household word. I remember when for the first time I went to the Middle East, one of the things I was most interested in seeing was precisely the cedars of Lebanon.

Lebanon is a very small country which consists of a coastal strip not more than a few miles wide at the foot of towering mountains which go up to about ten thousand feet. The mountain range is a hundred to a hundred and fifty miles long, twenty-five or thirty miles wide, and I expected, when I drove up into it, to find the cedars of Lebanon in profusion, as undoubtedly they once were. We drove and drove for hours up enormous hills and finally, after mile upon mile of absolutely barren country, came upon an enclosed space in which there were approximately four hundred cedars. Flying over the range later on, I saw two or three other such groves, and I believe there are in all perhaps fifteen hundred or two thousand cedars left. This is all that remains of the gigantic forest that supplied King Solomon with the timbers for his temple—if you remember, Solomon made a treaty with Heiram, King of Tyre, in which Heiram agreed that the timbers should be brought down to the coast, towed in floats to whatever port was appointed by Solomon, and then dragged to Jerusalem—and that for centuries supplied Egypt, which grows no trees of its own except palm trees, with all the timber it required.

This illustrates in a very striking way what man has been doing to his planet over the course of the centuries. He has found profusion in nature and in all too many cases he has completely devastated what he has found. Here we had a magnificent forest: these trees are very fine. You must have seen them in botanical gardens—the specimens grow all over Europe now, where they have been imported, and do very well in temperate climates. But, as Chateaubriand pointed out, 'les forêts précèdent les peuples, et les déserts les suivent' (forests precede civilizations and deserts follow them). During the time he has been on earth—which is anything from a half million to perhaps a million years—man has been increasingly a profound geological force. He has changed the face of the planet upon which he lives, sometimes for the better, but in all too many cases for the worse.

In the nineteenth century, the environmentalist school spoke of environment as conditioning and creating cultures but left out of account altogether the fact that cultures condition the environment—that man has certainly done almost as much to change the environment as the environment has done to mould the course of history.

In general, we may say that the realization that man is a changer of nature did not begin until the late eighteenth century. The first great

classical work on the subject was written in 1865 by George Perkins Marsh, who was the first American Ambassador to the new Kingdom of Italy. In this book Marsh collected all of the European material to date on the subject of man and nature and set it forth in a kind of philosophical context. One of the precursors in the field, it remains an extremely valuable book.

Let us begin by talking about the positive contributions which man has made to changing the planet. For example, most ecologists will now agree that the tropical grasslands, and quite possibly the grasslands of the temperate zone, were actually created by man and have been maintained by him in their open grassy state for hundreds of thousands of years. I suppose the most important of man's contributions are those he has made in bringing valuable plants or animals from one part of the world to another. In classical times such trees as the peach, the plum, the walnut, and the almond were brought from the Near East, the Middle East, and even the Far East to the Mediterranean; such valuable fodder plants as alfalfa and certain types of clover were brought from the Mediterranean and domesticated throughout Europe and later on in the New World; and such plants as peas and vines were carried from the West to China. The introduction of potatoes into the Old World from the New was revolutionary, as was the importation into Africa, Asia, and Southern Europe of Indian corn, from South and Central America.

What is true of plants is also true of animals. The most obvious case is the importation of the horse into the New World. The American Indians did all their hunting on foot before the Spaniards and the first English settlers introduced the horse. The North American Indians then rapidly took to this new quadruped, and you will see the same thing in South America. The only domesticated animal which the Incas, for example, possessed was the llama—the alpaca and the vicuna—which, in a pinch, can carry about twenty or thirty pounds on its back. But this was all they had, except for human beasts of burden, for transporting goods up and down those extraordinary mountain trails in the Andes. They have also adopted the sheep, which has entered into the Indian folklore of the Andes, and has become a kind of native animal there.

An interesting importation, from the East to Europe, was that of the cat. It came from Egypt (the local wild cat of Western Europe was never tamed) and didn't make itself much at home in Western Europe until the early Middle Ages. We can see, in the old fairy story of Dick Whittington, for example, how extremely valuable cats were and how remarkable they seemed. In the Saxon law preceding the Conquest of England a cat was so valuable that anybody who killed someone else's cat was expected to pay for it by pouring enough wheat to make a pile high enough to cover the cat suspended by its tail.

Another animal import from the East to Europe was the invaluable domestic chicken. It was brought from India into the classical world and has been with us ever since, laying eggs. It is a strange thing to realize that in the early classical period people had no eggs.

These are some of the immensely important changes for the good that man has brought to his planet. Now we have to consider the reverse of the medal. Man has lived only too frequently on his planet almost like a parasite living upon the host it infests. And whereas many parasites are sensible enough not to destroy their host, because after all if they destroy their host they destroy themselves, man is not one of the sensible parasites. Instead he has very often lived upon his host in such a way as absolutely to ruin it.

What are some of the ways in which man has proved most destructive? We will begin with the animals—a very depressing story, for we are wiping out creatures of extraordinary beauty and interest at rapidly increasing rates. If one looks at the statistics compiled by the International Society for the Protection of Nature, one learns that fifty species of mammals only were wiped out during the nineteenth century, forty more have been lost since 1900, and six hundred species are probably doomed to extinction at the present time. There is the case of the traveller pigeon, which existed at one time in such fantastic numbers that its flights used to darken the sun.

In the colonial and early post-Independence days one of the amusements of the inhabitants was to drive out to the woods where the pigeons nested, knock down the nests with the young squabs in them, fill entire wagons with these creatures, and drive home. Obviously, they couldn't eat most of them, and many were just thrown away to rot by the roadside. The same thing happened with the bison, which once counted fifty to sixty million head on the plains. Now the traveller pigeon is completely extinct and there are only a few thousand bison left.

Another very odd case is that of the Indian rhinoceros, which is now practically extinct owing to the fact of human—above all, Chinese—superstition: the rhinoceros horn was regarded as a kind of love philtre or amulet, and enormous prices used to be paid for it. I remember years ago going to visit the great warehouse in the docks of London where ivory, horn, and tortoise and pearl shell were brought in and auctioned off. I was very surprised to find that rhinoceros horn was selling at a considerably higher price than ivory, entirely because of the huge Chinese market for what was supposed to be an aphrodisiac; which clearly it was not. To satisfy a human superstition these interesting creatures now have been butchered off, and the kindred species is rapidly disappearing in Africa.

In many parts of the world the crocodile is disappearing. We shall miss this highly unsympathetic animal because he performs a very valuable function, as is now being discovered: crocodiles kill off the enemies of fish as well as the weak and diseased in the fish population. Where they have disappeared the fishing is much worse.

The great wild species of Africa survive at all solely because there are national parks in various parts of Africa where these animals are carefully protected. Presumably they will continue to survive, for the benefit of science and for the delight of people who wish to go outside the all too human world and see what the rest of the creation looks like.

Let us now consider the plant world. We will begin with the forests. I have already talked about the cedars of Lebanon, an immense forest of magnificent trees which have virtually disappeared, leaving the mountains to be eroded. In many places all the topsoil has been washed away and nothing remains except the naked rock; such places, it is quite clear, can never be reforested, and this same situation occurs again and again in every part of the world.

Man has been deliberately destroying forests since the hunting period: to clear forests—to increase visibility—the hunting tribes tended to burn off the underbrush, permitting the game to be hunted much more easily than it could be in a very dense forest. And, since agriculture began, probably about 8000 b.c., men have been cutting (and burning) forests in order to create new places where they could plant food crops. The whole

process was greatly speeded up after the beginning of the iron age, when it became possible, with the use of iron ploughshares, to break soils much too heavy for the wooden ones which had been used in the past. Another invention important to the greater spread of agriculture came towards the eighth century, when what appears to be an extraordinarily simple device, namely the horse collar, permitted horses to pull a much greater weight and to put much more strength into their pulling than they had been able to do with the previous forms of harness. Such technological advances, plus a slow but steady increase of population, have naturally led to the clearing of enormous forests.

Equally important in more recent times, especially in the destruction of forests which surround urban centres, has been the use of timber as a fuel. If you read Diderot's Encyclopaedia, you will find a very, very interesting account of the provisioning of Paris with wood for space heating. All the forests around Paris had been largely exhausted and the wood came in from hundreds of miles away, being floated on great rafts down the Seine and its tributaries. The rafts were then moored off the quays of Paris and the wood distributed. Diderot, one of the few intellectuals of the eighteenth century who was deeply interested in the technological progress of his time, stated that this could not go on and that the only hope was to use coal for space heating; in fact, at about this time coal did begin to be used on a considerable scale, which helped to save the forests from total destruction.

Besides space heating, wood was used in industry. All ores were smelted with charcoal until steel was made with coke for the first time at the beginning of the eighteenth century, so that there was a prodigious destruction of forests wherever there was a metallurgical industry. The same happened wherever there was a glass industry. Although glass was a very early invention—it goes back to about 3000 b.c.—it was very expensive and difficult to make until the art of blowing glass was perfected in the first century a.d. This invention very rapidly led to the formation of glass industries all around the Mediterranean and as far north as Cologne and England, with the consequence of an enormous massacre of the forests.

Another very important reason for the destruction of forests was the building of houses and, even more significant, of ships. It is interesting to find how early the timbers suitable for building ships were exhausted in Western Europe. The French navy couldn't find suitable timber in its own territory from about the end of the seventeenth century and had to be supplied largely by timber coming from as far afield as Albania. The Spaniards, at the time of their great naval expansion during the sixteenth century, were depending not upon wood from Spain, but upon wood coming from the Baltic.

You will find a reference in Pepys' Diary saying, 'God knows where our oak is to come from.' And in fact the oak was running out. By the eighteenth century, the period of Britain's naval supremacy, the oak for its ships was coming predominantly from the New World—from New England and the Eastern seaboard of this country. As for the rest, it was teak from the Indian Empire. Fortunately, perhaps, the Battle of Hampton Roads in 1862 proved that the iron ship was definitely superior to the wooden, and consequently shipbuilding ceased to be a reason for massacring forests of slow-growing trees.

The area where one sees the deforestation most clearly is in the Old World, most visibly in the ancient civilized world around the Mediterranean. You see it also terribly clearly in the Northwest here and

around the Great Lakes. There are, of course, great forests remaining in the United States, but the annual cutting of timber exceeds annual growth by about 50 per cent. It is quite obvious that you can't go on with this kind of thing for very long and hope to have many forests.

The forests in Europe used to come right down from the northern part to the Mediterranean coast. Today there are very few areas on the Mediterranean coast where you can still see traces of the ancient forests. In the south of France, east of Hyères, there is about a hundred square miles of forest called the Forêt des Morts; it is all that remains of the great primeval forest, which had already largely disappeared even in classical times, and which just vanished during the Middle Ages, largely because of the glass and soap industries of Marseilles and the shipbuilding industry of Toulon and Marseilles.

For those who are interested in landscape painting, it is a curious thing to realize that what we consider the typical landscape of Provence, such as we see in the paintings of Cézanne, is a relatively modern landscape. It represents hills which have now been weathered down, practically to their bare bones. Probably many of them are hopeless cases and can never be reforested. They are extremely picturesque, but we must remember that they are thoroughly a product of degeneration and destruction. The same thing is true of other parts of the Mediterranean. If you go to Tunisia and drive inland from Sousse, you will see a gigantic Roman amphitheatre, El Djem, which is second in size only to the Coliseum, standing in the middle of the desert.

El Jem was situated in a province which in Roman times was called Frugifera, the fruit-bearing province. Today it is almost completely deserted, with a few Arab huts scattered about at the foot of the great buildings. This same picture occurs again and again. Homer speaks about the tall oaks and pines of Sicily. Now you can cross Sicily from one side to the other and hardly see a single tree. There are a few places where attempts at reforestation have been made, but this once extremely well-forested, well-wooded country is now almost completely naked. The same is true of Greece, of Palestine and Syria, of Spain, and of Southern Italy.

Now we have to pass to another area of destruction at least as important as the destruction of forests—and resulting in some measure from it: the destruction of the soil.

The soil is a living organism. It owes its fertility to the existence within itself of great numbers of ecological communities of microscopic and macroscopic organisms of every kind. The topsoil, however, which contains almost all the soil's fertility, is not deep. The 2.8 billion people who are now inhabitants of the planet depend upon a layer of soil rarely more than about ten inches thick—and it takes three hundred to one thousand years to create an inch of it, so one sees the extreme danger of any process causing soil destruction.

Soil erosion, of course, happens all the time; it is one of the regular processes of geological change. But there is an immense difference between the slow erosion of nature left to itself and the rapid and destructive erosion which takes place when man wantonly strips the land of its vegetable cover, cuts down the forests, tears up the grass, or uses bad agricultural methods which leave the land vulnerable to the wind and the rain. Unfortunately, as we have seen, man has been committing such crimes against nature for a very long time.

One of the best descriptions of erosion was written, curiously enough, by Plato in his dialogue, the Critias, where he speaks of his own native country of Attica. It is worth reading because it is remarkable how accurate the description is. He says:

In comparison of what then was, there are remaining only the bones of the wasted body, as they may be called, as in the case of small islands, all the richer and softer parts of the soil having fallen away, and the mere skeleton of the land being left. But in the primitive state of the country, its mountains were high hills covered with soil, and the plains, as they were termed by us, of Phelleus, were full of rich earth, and there was abundance of wood in the mountains. Of this last the traces still remain, for although some of the mountains now only afford sustenance to bees, not so very long ago there were still to be seen roofs of timber cut from trees growing there, which were of a size sufficient to cover the largest houses; and there were many other high trees, cultivated by man and bearing abundance of food for cattle.

Moreover, the land reaped the benefit of the annual rainfall, not as now losing the water which flows off the bare earth into the sea, but, having an abundant supply in all places, and receiving it into herself and treasuring it up in the close clay soil, it let off into the hollows the streams which it absorbed from the heights, providing everywhere abundant fountains and rivers, of which there may still be observed sacred memorials in places where fountains once existed; and this proves the truth of what I am saying.

Such was the natural state of the country, which was cultivated, as we may well believe, by true husbandmen, who made husbandry their business, and were lovers of honour.

Plato gives this description of the frightful erosion already taking place in the fifth century b.c.—but he ascribes almost divine qualities to the husbandmen who obviously caused it. Rather as Ellsworth Huntington did forty years ago, Plato attributed all the trouble not to man but to a change in climate. He thought that what had happened to Attica had been caused by a series of deluges. But I think that if he hadn’t been so interested in platonic ideas and had been a little more concerned with what the husbandmen were actually doing, he probably would have seen that it was precisely these divine husbandmen who had done things to the soil which had left it in the ruined and impoverished state in which the Greeks of his own time found it—and Heaven knows it was relatively fertile then compared to what it is now. One may say that perhaps Plato would have done better to devote more attention to these dreadfully practical problems of nature than to the rather abstract metaphysical problems which engaged him.

And one can say something of the same kind about Socrates, who said that he saw no object in going outside the city walls because everything of interest was within them, and that his business was solely with men. But men do have to live on the soil and live in community with nature, and one wonders whether Socrates wouldn’t have done more good to his fellows if he had paid a little more attention to what went on outside the city walls.

Those of you who are acquainted with the literature of the conservationists will know what an immense amount of land has been destroyed here in an extraordinarily short space of time by wantonness. The same thing is true in many other areas of the world; there are vast areas of erosion in China, in Africa, in South America, and in Southern

Europe. And the dreadful process goes on and on, becoming progressively more and more dangerous as more and more people are born into the world and have to be supported and the increasing pressure drives peasants and farmers to attempt to get more and more out of the soil.

The combination of human destructiveness and population increase is an enormous and frightening fact. It is clearly one of the major problems confronting human beings at the present time. But it mustn't be thought that all people have been destructive all the time and everywhere. On the contrary, in many parts of the world, quite primitive people have shown remarkable understanding of preserving and conserving the soil. I had the opportunity of visiting the Inca regions of the Andes this summer. To see the Inca terraces rising from the floor of the Urubamba River two or three thousand feet up the side of a mountain is an exceptional sight.

Some of this wonderfully cared-for terracing is made with dressed stone, and some of the terraces are used to this day—they permit quite intensive agriculture on incredibly steep slopes (often thirty-five degrees). You go to a place like Machu Picchu, a fantastic city built on a sugarloaf hill, and you discover that its population, which was quite small—probably not more than two or three thousand—was able to survive for two or three centuries at least on its elaborate system of terracing. You will also find extraordinary examples of terracing in Indonesia and the Philippines: among the Igorots in the Philippines there is a wonderful rice cultivation. You will see the same thing in Java, and there is good reason to suppose that many of these rice-growing terraces have been used for a thousand, perhaps even two thousand years.

These are remarkable achievements, but one of the saddest things is to realize that the good examples which some people have set in some parts of the world have certainly not been followed in others. You will find the remains of the ancient pre-Spanish Inca terraces within thirty miles of Cusco, where the worst kind of farming practices have been used in barley cultivation and where the most fearful gullying and erosion is seen. One wonders why on earth modern farmers couldn't have taken the hint; evidently, as someone said, the greatest lesson of history is that nobody ever learns the lessons of history. Similarly, it is extraordinary that the methods of contour ploughing which are now being applied more and more to agriculture in this country were really not developed until thirty years ago, although a hundred and fifty years ago the process was already apparent to Thomas Jefferson, who talked about soil erosion and soil exhaustion. These facts are all the more disturbing when one realizes that, owing to the increasing pressure of population upon resources, there is extraordinarily little time.

There are several most powerful instruments of soil destruction which man has employed during the ages, but the most disastrous has probably been over-grazing, which has been going on at least since the domestication of sheep and goats—probably seven or eight thousand years. There is a very ironical point here: We generally feel a great sympathy for Abel and a great dislike for Cain, but let us never forget that Abel was the man who had sheep and goats and Cain was the agriculturist. Actually, if there was ever a justified homicide, it was probably Cain's destruction of Abel, because the followers of Abel in fact have performed incredible feats of destruction all over the world. Both the goat and the sheep are highly destructive; they are thin-lipped animals which pull up the grass by the roots and leave nothing. The sheep has accomplished frightful destruction in Spain. One of the oddest chapters of Spanish history is the history of Mesta, the great co-operative of the shepherds, who were in perpetual conflict with the agriculturists and who, in the course of

about three hundred years, succeeded in turning Spain almost into a desert.

Here it is worth mentioning something which has only been discovered within the last few years. It had been supposed that Southern Italy assumed its present barren aspect towards the end of the Roman Empire, the breakdown of agriculture at that time having led to deforestation and loss of fertility. But a recent discovery has shown that this is not true. During the war the Royal Air Force made an almost complete air map of Italy, photographing it very carefully with slanting light, which permits one to see the archaeological traces. It was found, to everyone's surprise, that what had previously been supposed to be barren since the time of the Roman Empire was in fact quite fertile at that time and even during the Dark Ages. You can see the traces of the fields and of the terracing and of the foundations of peasant houses. It is now realized that the destruction of this fertile and forested area in Southern Italy was a consequence of the introduction during the twelfth and thirteenth centuries of the Spanish methods of shepherding, which were completely ruinous to the country, and which left it in its present desolate state.

The goat is much more active than the sheep and can even climb trees to eat its food. It is quite fantastic what the goat has succeeded in destroying; it includes the whole Mediterranean basin. One of the worst things goats do is to prevent forests from reproducing themselves: they attack the young shoots as they come up and bite them down to the ground.

One of the few really good things that can be said for the British and their occupation of Cyprus is that they did persuade the inhabitants of the forested west end of the island to give up their goats in favour of forests. It was all done quite democratically. The administrators went from village to village and talked about the relative advantages of goats and forests: goats have considerable advantages here and now, but the advantages of forests later on are very much greater. A great many villagers were persuaded to tether their goats and to give up a certain proportion of them, with the result that there has been a remarkable revival of forests on the mountains of western Cyprus. Similarly, in Lebanon there is absolutely no prospect of reforestation (where it is still possible) until the goats are kept under control. Lebanon is divided politically along religious lines—the Moslems, the Druses, the Maronites, the Armenians, the Greek Orthodox. I was told the story of the Maronite bishop who came into the ministry of agriculture and said, 'You will be glad to hear, Your Excellency, that we are doing very well with our goats in the mountains, but I regret to say the Orthodox goats are still creating an immense havoc.'

Goats go on creating awful havocs in spite of all legal restraints. Great efforts have been made in Algeria and Tunisia to control the goats by law, but it is almost impossible to enforce the law, and the destruction goes on. And in Madagascar the government, which should have known better, introduced a valuable kind of goat which produces some useful hair, with the result that now, after some twenty-five years, only 20 per cent of the forest remains.

If over-grazing is of enormous importance in the creation of conditions for erosion, equally important, and possibly more important because it has been going on longer, is fire. We have already seen that man has used fire deliberately since earliest times to clear land for hunting and agriculture. The forests of Western Europe were largely cleared by fire—one sees traces of this even in the place names in England: 'Brentwood' means just burnt wood; 'Brindly' means burned lee or burned clearing. But

far more destructive than man's deliberate efforts have been the accidental fires resulting from his carelessness.

Geologists find a notable increase in fossil ashes from the beginning of Pleistocene time, about a million years ago, which would seem to indicate that even at that very remote period man or his near human ancestors had discovered fire. We know in any case that Peking man, who dates undoubtedly from 250,000 years ago (and possibly from half a million), had fire, and accidental fires have been occurring ever since.

One of the great tragedies in this country has been the fabulous amount of forest destroyed by accidental fires. The record is incredible: on this coast, in Washington, there were fires in 1865 and in 1868, one of which destroyed a million acres, the other six hundred thousand. There were very few fires in the area before the settlers arrived in 1847; after this date, they were absolutely incessant. There was the great Idaho and Montana fire of 1910, which destroyed eight and a half billion feet of lumber, and, one of the worst, the Tillamook fire of 1933, which destroyed twelve and a half billion feet. This is what the United States would have consumed in one year, and it was wiped out in a single fire in a week. It has been calculated that in Oregon, from the first settlements to about 1908, when fire protection was installed, about thirty-two billion feet of lumber had been cut and used while about forty billion feet had been destroyed accidentally by fire. Now elaborate firefighting organizations have been created, but anyone who sees the difficulty of controlling even a brush fire in California—we have had them recently—can realize that it is still profoundly difficult to control this engine of destruction. When one reflects that in countries like Chile forest fires are completely without control and rage for weeks, blackening immense areas, one sees the enormous importance of this human geological force.

What man is doing to his world unfortunately makes a gloomy picture. There is very little way to make it non-gloomy. In one of the next lectures I shall try to make a bridge from these facts to the problem of morality, the problem of what our philosophical views of nature should be. For we should think of these brute facts not only in a purely practical way, but also in a kind of metaphysical and ethical and aesthetic way. It is terribly important, I feel, that we should be able to think of these things with our whole nature, not merely as technologists, not merely as people who want to eat and to have timber products, but as total human beings with a moral nature, with an aesthetic nature, with a philosophical trend in our mind.

The end