

THE EVOLUTION OF THE IDEA OF EVOLUTION

In fifteen years, one could well say tomorrow, we will enter into the twenty-first century and at the same time cross into a new millennium: the third since the birth of Christ. So the calendar is composed, dates are imposed on us to which we often attach a symbolic value. We celebrate the new year as a happy occasion, full of promises. We exchange wishes of prosperity, health and happiness with our relations and friends. Yet an anniversary is also the opportunity to turn back, to stop for a moment at the roadside and consider the journey so far accomplished.

From the year 1000 to the 19th century nothing, or almost nothing, changed. Europe seemed to be in an endless sleep that even the Renaissance hardly disturbed. Few things except ridicule and pedantry divide the doctors of Molière from those of the School of Cos inspired by Hippocrates.

Everything begins to stir at the end of the 18th century with the

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industrial revolution which brings into general use the steam engine. Man henceforth knows he possesses an energy incomparable to that supplied until then by his muscles, his domestic animals and, in addition, his mills. After a difficult phase, which will see the growth of a wretched proletariat—former farmers chased from the countryside and coming to the urban factories in search of a wage—, hygiene, food, health and the standard of living will slowly but surely improve. Statistically speaking the mortality rate drops.

A liberal wave initiated in France by the Encyclopedists and which will result in the French Revolution, shakes the entire old absolutist Europe. The American Constitution which desires to be a model of rationality and humanism will be based on the principle of the Enlightenment. It is therefore in this favourable climate, eager for innovations and progress and possessing an absolute faith in mankind that this extraordinary explosion of life sciences arrives in the second half of the 19th century. Indeed in less than thirty years, christened "*les trente glorieuses*" by Jean Fourastié, Charles Darwin shows the reality of the evolution of the species and offers a coherent schema in order to explain it, thereby destroying the myth of creation. Man is no longer the son of God but of time and selection. Henceforth in the family photo, we find ourselves at the head of the primates, right beside our first cousins the chimpanzee and the gorilla... Not long after Louis Pasteur proves the existence of micro-organisms responsible for many illnesses. He will draw from this two applications of major importance: vaccinotherapy (which immunises the subject in advance against its aggressive agent) and serotherapy (which, by producing antibodies, helps the patient to fight against the pathogenic agent). The myth of the spontaneous generation is definitively abandoned. Asepsis and antisepsis allow spectacular progress in surgery by avoiding post-operative infections, often fatal.

Meanwhile an unknown Morave monk, Gregor Mendel, working alone in his small garden in the monastery of Brnő, discovers the laws of heredity. But this fundamental demonstration will not become known until the beginning of our century. Sixteen years after Mendel's death his posthumous fame will be immense. Finally Claude Bernard leads the way for modern physiology by proving the constancy (physics, chemistry) of the "interior milieu" of man (essentially the blood), constancy obtained at the price of multiple

The Evolution of the Idea of Evolution

regulatory phenomena which tend to re-establish all variations within the limits of the normal. And one will see that this is the case for all superior vertebrates (the only ones really studied at this time). Thus, at the close of the 19th century, there has been a profound upheaval in medicine and biology. The future offers great hopes. There is no telling where science may lead.

THE NEW CONVERGENCE OF LIFE SCIENCES AND THE SCIENCES OF MAN

These upheavals not only affected the volume of learning which in thirty years overtakes all that had been accumulated in 2000 but they bring into question beliefs until then firmly anchored in European nations, certain inalienable values concerning revelation and faith, which nothing seemed to be able to uproot. It is Darwin who is mainly responsible for this conceptual revolution.

For centuries, human beings had been considered as God's creatures. According to Genesis, every species, both animal and plant, came into being by divine will as we recognize them today. Only a supreme intelligence could explain the astonishing adaptations of the living being to its environment. Are fish not remarkable swimming machines and birds "objects" made to fly? And what can be said about the adjustments observed in both vertebrate and invertebrate and which bestow on the animal a highly efficient working tool. (For example, the digging paws of the moles among the mammals and those of the mole cricket among the insects). Nothing, it seemed, could call into question this fixed theory of nature and of society.

Linné himself, the Swedish scientist who, in the middle of the 18th century, compiled a comprehensive list of all the groups, both animal and plant, and defined them, giving each a Latin second name (mouse becomes *mus musculus*, man, *Homo sapiens* etc.), avoids confronting the question of fixism. Indeed he classifies and finds undeniable relationships between neighbouring species, but at no time, not even in his letters, does he suggest even an ordinary evolutionary process. Did he perhaps consider this possibility? Having learnt by the unfortunate experience of Galileo, he was prudent.

Everyone still remembers how, by taking up the heliocentric theory of Copernicus (the earth revolves around the sun which is immobile, contrary to what is written in the Scriptures) and by showing the error of *geocentrism* (the earth, inhabited by man, would be the centre of the universe and its fixed point), the unfortunate Italian scientist attracted the wrath of the Inquisition and ended his days, after endless persecution, in a somewhat limited freedom. On the other hand the French Encyclopedists, and in particular Diderot, proclaim the the evolutionary phenomenon, due to which species descended one from the other through a certain number of transformations. The *Directoire* which regrouped the “Royal Gardens of Pharmaceutical Plants” into “The National Museum of Natural History” set up in this establishment a number of new chairs. One would be dedicated to vertebrates and occupied by Geoffroy Saint-Hilaire, the other to animals without vertebra (later known as invertebrates) and dedicated to Jean-Baptiste de Monnet, *chevalier de Lamarck*. A committed evolutionist, Lamarck, in 1809, publishes his *Philosophie zoologique*. According to him the development of certain organs depends on their intensive use and their atrophy on their lack of use. It is because the mole leads an underground life and digs tunnels that it develops digging paws and almost loses its eyesight, more or less unnecessary for an underground animal. As for the giraffe, forced to search always higher for leaves on the trees (as the lower levels are consumed), his neck had to lengthen gradually to the very limit permitted by the laws of physics (gravity exerting on the highly placed skull).

Thus Lamarck acknowledges the heredity of acquired characteristics. Now no proof exists in this field; in fact the evidence proving the contrary is considerable. One can, for example, cut the tail off a couple of mice before letting them reproduce and repeat the process for generations. The baby mice will persist in being born with a normal tail. Thus Lamarckism will not be remembered by the scientific community. This principle of the non-heredity of acquired characteristics has never been reviewed: except, in the middle of our century, by a former station master, Trofime Lyssenko, paranoid pseudo-scientist and friend of Stalin, who brought about a reign of terror on Soviet biology for thirty years. But let us leave this less than glorious parenthesis and return to the 19th century.

The Evolution of the Idea of Evolution

Only 50 years after Lamarck's work, Darwin publishes, on 24th November 1859, his famous work on the origin of the species. This had been developed over a quarter of a century following minute observations collected mainly during his world voyage in the *Beagle* between 1831 and 1836.

According to Darwin spontaneous variations appear occasionally inside every population, even the most homogeneous. If a variation bestows on its bearer the slightest advantage over the "normal" individuals, he and his lineage tend to slowly overrun the territory, taking over the resources and eliminating the ancestral line. On the other hand if the variant is disadvantageous, he and his lineage quickly die out. Besides his own observations, Darwin is struck by the results obtained by the breeders during the selection of domestic species. Here, however, there is no mystery. It is man who deliberately chooses the offspring at birth, keeping only those conforming to the desired model. The others are ruthlessly eliminated. Thus the most productive milk cows, the sheep with the thickest fleece and the most fertile laying hens are obtained in the shortest time. The question that remains is who, in the primitive state, plays the role of the breeder: in other words, guarantees the selection of the best. Darwin finds the answer in Robert Malthus, demographer and minister who lived at the turn of the 19th century. According to Malthus the effective force of a population develops quicker than its resources. Thus, under the effect of demographic pressure, all the groups tend towards a state of want which leads to fierce competition between generations. In order that the resources of each man are sufficient, it is necessary that the number of subjects remains the same. This is obtained by a rivalry in the heart of each group, rivalry which leads to the elimination of the weak to the benefit of the strongest, of the less apt to the benefit of the best adapted.

Darwin sees in this "fight for life" the very driving force of evolution and therefore of progress.¹ Darwin's theory, well received by the scientific community as a whole, will give rise to violent controversies. In a society still profoundly religious, it calls into

¹ For further details see: J. Ruffié, *Le traité du vivant*, Collection "Le temps des sciences", Fayard 1982.

question the direct creation of man by God. For Darwin, the appearance of our most distant ancestors, offspring of a group of monkeys, is only the result of a long series of rivalries allowing on each occasion the survival of the fittest. We are therefore closely related to the apeman. One can easily imagine the scandal from such a declaration, that no longer makes man the son of God but the product of a happy evolution from a common ancestor to both our species and the great African monkeys. And if Queen Victoria, unanimously revered, will soon be the grand-mother of all the crowned heads of Europe, she is also the first cousin of the chimpanzees at London zoo!

THE DARWINIAN SCHEMA, SOCIOLOGY AND POLITICS

But Darwin's theory also meets with a remarkable success. It is based on the inequality of individuals and their fight, which bestows on man the place he merits. So the Darwinian schema seems to justify scientifically the social and political state prevalent in this period of the 19th century and offends many people. We have already mentioned the wretched situation of the sub-proletariat created by the Industrial Revolution. It is explained by a social Darwinism, above all developed by Charles Darwin's cousin Galton, and at the end of which the poor live in that state because they are incapable of attaining the slightest riches. Socially they are unsuitable. They find themselves in the position that natural competition has allowed them to reach. Their status, despite its wretchedness, is written in the law of evolution. It constitutes the ransom to be paid for progress. The same reasoning is transposed to the level of commercial factors. The beginnings of the industrial age are characterised by fierce competition. It is the age of free enterprise. Only one rule: that the strongest wins and crushes the others. This occurs on a day-to-day basis and international relations follow the same principles. If the great European powers have dominated the coloured races on all the continents, it is because they are biologically suitable to do so. Therefore, we see here the justification of the great colonial adventure, with its indisputable achievements and its none the less indisputable abuses. At the very worst it is here that the slave trade finds its justification. The wars

The Evolution of the Idea of Evolution

between nations are considered inevitable and even necessary since they constitute, at the human level, a biological necessity indispensable to the growth of our species without which we would still be at the height of the stone age. Darwin's schema reassures the ruling classes of Old Europe and her daughter, the young America. His theory also eases the conscience of those tormented by numerous sins, the most striking historical example being, without doubt, the opium war.

Strangely enough, Darwin's theory will also be of use at the other end of the political spectrum, to bring back under discussion the liberal and capitalist society. From the first half of the 19th century, evolutionary ideas spread into sociology, above all through the medium of Marx and Engels. Considerably before the publication of *The Origin of the Species* Marx believes in the biological evolution and announces his conviction that the laws of biology will update those of a "social transformism". It is thus with enthusiasm that the two companions become aware of Darwin's theory. They have finally acquired the scientific foundations previously missing in their world vision. They simply transpose the fight between individuals or nations to that between the classes. For them, while its effective force will increase by the impoverishment of the small owners, "hammered" by the big capital, the world of work, under the effect of ruthless competition is called on to become more and more proletarian.

On the other hand, the richest families will become richer, but less numerous. Finally, when the proletariat has reached a sufficient number, the social balance will swing in its favour. It will become capable of imposing its own dictatorship, it will take over all means of production and will establish a new distribution of wealth. The collectivist society, classless and nationless, will suppress all the causes of conflict...And man will know a new earthly paradise.

On 12th December 1859, barely a few days after the publication of Darwin's book, Engels writes Marx an enthusiastic letter: "this man Darwin, whose book I am reading, is quite sensational...never before has an endeavour of such scope been made to demonstrate that there is an historical development in nature".

Marx immediately shares his enthusiasm. Praise and approbation follow. On 19th December 1860 he writes to Engels that he

sees in Darwin's work: "the foundation provided by natural history to our way of thinking", and to Lassalle, a few weeks later, that he found there "the basis provided by the science of nature for the class struggle".

In consequence Marx will try endlessly to approach Darwin. He writes to him on several occasions, sends him the first tome of *Das Kapital* illustrated with a complimentary dedication. Darwin will not read it. The book is still in his house, now a museum: only the first few pages have been cut. Later Marx tells Darwin how much he would like to dedicate to him the second volume of *Das Kapital*, still in preparation (it will only be published after the author's death thanks to the perseverance of Engels). Darwin replies with a polite but definitive refusal: "I should prefer that the tome or volume not be dedicated to me... as this would imply my approval of the entire work, of which I know nothing."²

The 19th century reaches its conclusion. It had begun with the Napoleonic wars which led Europe into a bloody turmoil. It closes in enthusiasm and euphoria; humanity is overwhelmed by all it has discovered. Physics, chemistry and medicine have progressed immensely. In France and in the majority of European countries education has become compulsory. Illiteracy declines, culture begins to enter into even the most modest households. Travel, previously the preserve of a small privileged elite, increases thanks to railways and steam boats which bring men and continents together. Raw materials are exchanged for manufactured products. News travels quickly and far due to the invention of the telegram. In a few minutes, a dispatch sent from Paris arrives at St. Petersburg (today Leningrad; at that time the capital of the Tsars) whilst the same journey previously took weeks, even months. The English lay the first underwater cables linking Europe with America and later with Australia and New Zealand.

Many wonder how far progress can go. Is it perhaps limitless?

A scientific wave breaks on old industrialised Europe barely emerging from the mist of the Middle Ages, even if the Renaissance had opened some horizons. Perhaps science will resolve everything and end by making man immortal...

² For further information about the relations between Darwin and Marx (and particularly their correspondence, the authenticity of which is doubted by certain people) see Bernard Naccache *Marx, Critique de Darwin*, Paris, Vrin, 1980.

The Evolution of the Idea of Evolution

Confronted with this new idol the traditional Church shows the greatest reserve. Soon “modernism” (covering pell mell both scientific and social theories) will be outrightly and ruthlessly condemned. Yet at the same time the standard of living will improve. Contrary to the prophecies of Marx, the workers in industrial countries did not form a solid proletariat. Quite the contrary: many yield to a certain comfort and will form the middle classes which quickly compose the majority of citizens, they monopolise power and set up liberal regimes everywhere. The only country which, aided by the 1914-1918 war, will swing into collectivity, is Tsarist Russia, barely industrialised at that time and still prisoner of feudal structures. Finally, none of Marx’s prophecies will be realised. No prophet has ever given a more fallacious vision of the future.

THE 20TH CENTURY AND THE POPULATION REVOLUTION

George Mendel died in 1884 in almost complete obscurity. His work will only become known in the years 1900-1901. It will come to bring a revival of interest in Darwinism by bestowing on it, in some way, a new scientific justification. According to Mendel, each hereditary characteristic is controlled by *two* material particles, later known as genes, one coming from the father via the spermatozoid the other from the mother via the ovule, and which are connected at the moment of fertilisation (fusion of the spermatozoid bringing one series of genes and of the ovule bringing another series which gives the fertilized egg all the genes in duplicate). Resulting from this egg through multiplication, all the cells from an individual will bear the same patrimony.

The visible end result which appears in the subject (called its *phenotype*) is therefore the fruit of the simultaneous action of the maternal and the paternal genes interacting. In the majority of cases, the two genes are identical, their action going in the one direction. But occasionally it happens that one of them shows a structural difference. It then forms a *mutation* of the “normal” gene called *wild*. Its action can be different and the subject bearing it is called *mutant*. Here one finds the origin of the variations observed by Darwin on occasion in all groups: they correspond to mutations on which the selective force is brought to

bear. Between the mutant gene and the normal gene (which form a couple of alleles) the selection keeps the one which bestows the most advantageous characteristic. The other is eliminated. That is to say that those possessing it are destined to die out slowly but surely. The competition takes place in reality at the level of the gene through the medium of the carrier organism which is associated with natural selection.

Thus all subjects living at the same time, in the same conditions and subject to the same selective forces will have the same genetic patrimony: the one capable of best responding to the constraints of the environment. Between a gene A and the mutation A', selection will have to choose and conserve either A or A': the more advantageous. This conception, typological and standardising, prevailed until the middle of our century.

From 1960, by studying the *direct* product of genes in both animal and plant life (in particular: the enzymes and other substances), it was noted that no population was genetically homogeneous, but rather offered a great variety. This phenomenon, known as *genetic polymorphism*, forms a constant principle found in all living groups. In other words, having the choice of the gene A and its mutation A', selection nearly always decides to keep A and A'. One now knows the origin of this phenomenon, at first sight paradoxical. The ecological niche occupied by each species is never constant but always heterogeneous. It varies in time (seasons: summer/winter; days: sun/shade) and in space (altitude, exposure of the site etc.) Often one has only to go from one side of a rock to the other in order to find completely different atmospheric conditions.

A population composed of individuals with the same hereditary patrimony (that is to say all possessing the same potential) will shut themselves within restricted limits. All individuals who compose this group will be active at the same time, will look for the same food and seek the same environment, in other words will all want to settle in the same place, they will desire the same sexual partner. A fierce rivalry will prevail between individuals all aiming at the same goal and living this way in a confined territory. The quantity of natural resources to share between them will be very limited.

Let us consider on the other hand a population with the same

The Evolution of the Idea of Evolution

effective force but composed of genetically varied individuals (A, A', A'', etc.). In other words, possessing very different abilities. Some will be active in the morning, others at midday or in the evening and some even at night. Some will prefer a vegetarian diet, others a mixed or meat diet. There will be those who like blonds and those brunettes. Some will look for cool spots, others hot places. Thus the limits of the niche will be notably extended. The resources which are offered to its visitors will be much superior in quantity. There will be little rivalry as each man looks for that which suits him best without disturbing his neighbour. How can one not see the enormous selective advantage bestowed by such a structure? It is not surprising that between pure races made up of people all subject to the same behaviour, trapped in a narrow niche, and between polymorphic populations capable of working at any time, of exploring and exploiting in every way their environment, natural selection chose the second formula, considerably more advantageous on both the individual and collective level. Excluding harmful mutations quickly eliminated, every new, original mutation is favourably received.

Man is not exempt from this rule. We know, since the discovery of blood groups, that these are found in every traditional race. Only their frequency varies. But the types A, B or O, for example, are seen among Blacks as well as Whites and Yellows. The same can be said for all groups studied to date (Rhesus factor, HLA groups etc.). The most advanced studies now show that we are faced with a constant and really colossal genetic polymorphism. The number of possible combinations between the genes and mutations is such that whatever the effective force of a population, it is practically impossible to find two individuals with exactly the same hereditary patrimony, except in the very particular case of identical twins, born from the same egg and therefore corresponding to one model, produced in more than one copy.

Genetic polymorphism characterising every population constitutes a fundamental principle of nature. Furthermore, we now know that the *unity of the living* on which natural selection works, is not the gene itself or the individual bearing it but *the population as a whole*, with all its genetic inheritance, composed of varied and complementary elements. The greater the diversity, the more efficient and capable the population of confronting innumerable de-

mands. By himself, the isolated individual is of little significance. Everything depends on his contribution to the ensemble to which he belongs. It is the population that forms the target of selection. This populationary vision of the present day world shows without doubt the greatest conceptual revolution known by the life sciences since Darwin demonstrated the reality of the biological evolution.

SOCIO-BIOLOGY OR BIO-SOCIOLOGY?

We have seen the influence that the Darwinian schema, selective and standardizing, had had on the sociological and political thought of his time. Both fierce capitalism and unbridled Marxism believed that they had found there their justification. Now this schema, in its primary explanation, is false. No biologist or genetician would dream today of reviewing the populationary vision to the advantage of the former typological theory. The problem which now arises is the following: can one still accept sociological systems which are based on mistaken foundations? Systems which have shown, before our very eyes, their ineffectiveness, even their absurdity? But in philosophical and political matters, whatever standpoint is adopted, we are incorrigible conservatives. It is always difficult for the human mind to abandon the soft comfort of "certainties" passed down through tradition and believed to be unquestionable, and again question them. And yet with the constant progress of knowledge, this questioning cannot be avoided. Who, nowadays, would dare to claim that wars have allowed mankind to progress? And would Marx recognize in the immense Soviet "Imperium" the classless ideal State whose future he foresaw? Today's reality is far from the dream of yesterday.

Despite this patent failure, the typological theory rises occasionally from the ashes. Its last avatar is *sociobiology*, sustained by E. Wilson, a brilliant entomologist from Harvard University.

According to Wilson, each individual only obeys an innate tendency: to spread to the absolute limit his own genes. It is to sow one's wild oats on the planetary scale. This "genetic egoism" inevitably involves rivalry. And so one returns to the triumph of the best, which is incompatible with the principle of generalised polymorphism observed everywhere. Wilson's theory, which met

with a certain amount of favour in milieus pervaded by racist ideology, has never been seriously considered by geneticists and, generally speaking, all those working in the field of human biology. Furthermore it is scarcely mentioned nowadays, its author having had to acknowledge that his theory, albeit valid for social insects who act according to innate behaviour, was hardly applicable to our societies where the role of upbringing becomes primordial and dictates to us, much more than our genes, our way of living.

About forty years ago, Claude Lévi-Strauss brilliantly elucidated that the “principles of marriage” observed in all civilisations, even the most modest, corresponded not to biological but cultural imperatives. Furthermore a famous Japanese geneticist, Motoo Kimura, has just, from mathematical models corresponding exactly to what is observed in nature, provided further food for thought for the populationists. Kimura has demonstrated that the majority of mutations were selectively neutral and that their distribution only obeyed the laws of chance. This theory, known as neutralist, places great importance on the aleatory phenomena. Thus, alongside natural selection which imposes on living beings a minimal adaptation to the environment, chance continually comes to modify the tendencies of the evolutive process.

Chance is also then a variation factor for the living being. We therefore find ourselves confronted with a fundamental revision of biological and thus sociological conceptions. So that the gradual evolution can advance, it will be necessary for the next millennium to adopt a new kind of civilisation inspired not by the false certainties of the 19th century but by the experiences of the end of the 20th century. Genetic polymorphism, complementariness and coordination constitute, as previously mentioned, the value of a population. Not its uniformity and aggressivity as Darwin believed.

Aggressivity can be an advantageous factor when one is certain of winning. Yet one can never be certain of not meeting a more aggressive, stronger and more destructive group some day. For the attacker the attempt then turns not to extension but catastrophe. Natural selection does not destroy, it creates. It does not demolish: it continually seeks out new uninhabited niches. Running the risk, for this, of “imposing” new structures on the living being, the fruit of spontaneous mutations, selected by a rigorous choice.

Whence comes the extreme diversity of the animals and plants surrounding us and also the constant inclination of life to invade everything. Today mankind can only progress if it renounces strife between nations, those scars of history, as Charles de Gaulle wrote of frontiers. It must also abandon this fiction of the class struggle, whose boundaries are in reality ever less distinguishable.

The symbol of Yalta, now forty years old, shows mankind the path not to be followed. By cutting the world into two blocks devoted to opposing ideologies (but inherited, as we have seen, from the same pseudo-scientific schemas), this historic meeting created a conflictual and perilous situation. In its very essence it is anti-evolutive, blocking mankind in an endless wait for a now possible auto-destruction. The display of power must be replaced by negotiation: tutelage of peoples through the freedom to govern themselves. Mutual help between men and nations must replace the rivalry which, along with the nuclear arms potential accumulated to date, could bring about the end of life form on earth. In a few minutes, even seconds, the prodigious adventure begun over 4 billion years ago, and which, through many obstacles, finished by engendering man and at the same time taking account of itself, would be brought to an end. Finally we must abandon our last animal instincts of egoism, domination and exclusive possession to submit to the complete control of the human condition. To understand that each individual is unique both biologically and culturally and, as such, must bring his contribution, however modest, to man's common inheritance, thus enriching each generation. But this contribution is only possible if the individual is free to think and act. Human polymorphism only takes on its full significance in freedom. No matter what uniforming constraint, from outside, takes us back hundreds of thousands of years. What would be the use of being freed from our genetic programmes if we were to fall under the blow of equally tyrannical ideological programmes? Being different, we each have a singular value. We are equal because we are not identical.

Technical progress must help us to seek this transformation. The next century will see another revolution, that of telecommunications and "robotics", already under way. It will liberate man from the most tedious chores (conveyor belt work) and will provide riches at low prices. The problem which will confront our

The Evolution of the Idea of Evolution

successors will no longer be to produce but to distribute the production fairly among both individuals and nations. Life expectancy will continue to increase, lengthening the retirement period, while progress in medicine will guarantee a healthier old age. It would indeed be useless to hope for immortality. The programme of life characterising every species ends inevitably in death. For the sequoia it is 2 to 3000 years. For the sea-turtle 200 years and for man even as far as a 100 years. Progress in hygiene and diet will delay terminal illnesses, destined to become shorter. The "age pyramid" which visualizes the composition of a population will become an "age obelisk". Invalidating old age will be shortened. Our successors, mainly freed from the constraints of physical labour and the burden of age, will be able to apply themselves more than we can to the creative activities, specifically human: research, plastic arts, literature, history, music... It will be appropriate to define these singular values, unknown until our time and which we call justice, dignity, freedom and love. They alone can allow us to attain the fullness of life; in other words, happiness. But they will only flourish in a world built finally in our image, released from the last fetters which tie us to animality from which our race, a latecomer, is barely on the point of leaving. Henceforth it is a consciousness that is imposed on men of good will. It exists in every nation and every milieu. Our contemporaries must consider the possibilities and opportunities offered to them as well as the dangers which threaten them. Furthermore we can no longer choose. The future is in our hands. That the awareness of life and perhaps of the universe, born with man, is not merely a flash of lightning illuminating an eternal night depends on us. But we can also keep this light and attain this "humanitarianism" which the sages of all times have experienced and called for in their prayers, from Buddha to Jesus, from Abraham to Mohammed.

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