

GROTHENDIECK CERN SPEECH

LADIES AND GENTLEMEN, GOOD EVENING.

— In our cycles of lectures, for the ten years that we have organize, we have periodically asked scientists to come and reflect on science, on the responsibility of the scientist and I believe it is particularly necessary to do so because we have a tendency at CERN to take ourselves for people extraordinary people who do theoretical things that are not dangerous at all, within an exceptional European collaboration. So always taken by these beautiful ideas, we are perhaps a little too inclined to be satisfied with them and not to ask deeper questions. It is precisely to go one little further that it is useful to have speakers like Mr. Grothendieck that we have this evening and to which I immediately yield the word.

Alexander Grothendieck.

— I am very happy to have the opportunity to speak at CERN. For many people, including myself, CERN is one of the few citadels, so to speak, of a certain science, namely advanced nuclear research. I have been corrected, however, as it seems that CERN, the European Organization for Nuclear Research, does not actually conduct nuclear research. Nevertheless, I believe that this is the prevailing impression among many people.

For many, nuclear research is closely associated with military research, A and H bombs, and also with a growing problem: the proliferation of nuclear power plants. In fact, since the end of the Second World War, concerns about nuclear research have been somewhat alleviated as the memory of the atomic bombing of Hiroshima and Nagasaki faded. Of course, the accumulation of destructive weapons such as A and H bombs kept many people worried. More recently, the

proliferation of nuclear power plants, which aims to meet the growing energy needs of industrial society, has been shown to have serious drawbacks, to put it euphemistically, and poses very serious problems. It is not exceptional for advanced research to be associated with a real threat to the survival of humanity, even to life on the planet. Since I started asking questions about this topic a year or two ago, I have realized that in each of the major issues currently threatening the survival of the human species, these questions would not arise in their current form, and the threat to survival would not arise, if our scientific state was the same as it was in 1900, for example. I do not mean to say that science is the only cause of all these ills and dangers. There is, of course, a conjunction of several things; but science, the current state of scientific research, certainly plays an important role.

First of all, I could perhaps say a few personal words. I am a mathematician. I have devoted most of my life to mathematical research. As far as mathematical research is concerned, the research I have done and the research done by colleagues with whom I have been in contact seem to me to be very far removed from any kind of practical application. For this reason, I felt particularly uninterested in asking questions about the ins and outs, especially the social impact, of this scientific research for a long time. It is only recently, in the past two years, that I have gradually started asking questions about this topic. I have reached a position where, in fact, I have abandoned any kind of scientific research for the last year and a half. In the future, I will only do the minimum necessary to support myself since, until proven otherwise, I have no other profession than mathematician. I know very well that I am not the only one to ask this kind of question. For a year or two, and even in the last few months, more and more people have been asking key questions about this topic. I am completely convinced that many scientists and technicians at CERN are also starting to ask themselves these questions. In fact, I have met some of them. In addition, myself and others know people at CERN, for example, who have "extremely serious" ideas about the so-called peaceful applications of nuclear energy; but who are afraid to express them publicly for fear of losing their jobs. Of course, this is not an atmosphere that is specific to CERN. I believe that it is an atmosphere that prevails in most academic or research organizations in France, Europe, and even to some extent in the United States where people who take the risk of openly expressing their reservations, even on strictly scientific grounds, about certain scientific developments, are still a tiny minority.

For the past year or two, I've been asking myself questions. And I haven't just been asking them to myself. I've been asking colleagues as well. Particularly in the last several months, maybe six months, I've taken every opportunity to meet with scientists, whether in public discussions like this or in private, to raise these questions. In particular, "Why do we do scientific research?" A question that is practically the same, at least in the long term, as the question, "Will we continue scientific research?" The extraordinary thing is how my colleagues are unable to answer this question. In fact, for most of them, this question is simply so strange, so extraordinary, that they refuse to even consider it. At any rate, they hesitate enormously to give any kind of response. When we manage to get a response in public or private discussions, what we usually hear, in order

of frequency of responses, is: "Scientific research? I do it because it gives me pleasure, because I find certain intellectual satisfactions in it." Sometimes people say: "I do scientific research because I need to make a living, because I'm paid to do it."

Regarding the first motivation, I can say that it was my main motivation during my life as a researcher. Indeed, scientific research gave me great pleasure and I didn't question it much further. In fact, if it gave me pleasure, it was largely because social consensus told me that it was a noble and worthwhile activity, without really explaining why it was positive, noble, etc. Of course, direct experience told me that, with my colleagues, we were building something, a certain structure. There was a sense of progress that gave a certain feeling of achievement... of fulfillment, one could say, and at the same time, a certain fascination in the problems that arose.

But all this, ultimately, does not answer the question: "what is the social purpose of scientific research?" Because if its only purpose was to provide pleasure, let's say, to a handful of mathematicians or other scientists, society would undoubtedly hesitate to invest significant funds in it - in mathematics, they are not very significant; but in other sciences, they can be. Society would also undoubtedly hesitate to pay tribute to this type of activity, while remaining relatively silent on activities that may require just as much effort, but of a different kind, such as playing marbles or similar things. One can develop to an extreme certain abilities, certain technical faculties, whether intellectual, manual or other, but why is there this valorization of scientific research? It's a question that deserves to be asked.

In speaking with many of my colleagues over the past year, I have realized that the satisfaction that scientists are supposed to derive from their beloved profession is actually a pleasure... that is not pleasurable for everyone! To my surprise, I have discovered that for most scientists, scientific research is felt as a constraint, as a servitude. Conducting scientific research is a matter of life or death as a member of the scientific community. Scientific research is imperative for obtaining a job, when one has committed to this path without really knowing what it entails. Once one has their job, it is imperative for advancing in rank. Once one has advanced in rank, even if they have reached the highest rank, it is imperative for being considered as being in the race. They expect you to produce. Scientific production, like any other type of production in the current civilization, is considered an imperative in itself. In all of this, the remarkable thing is that the content of the research is entirely secondary. It is about producing a certain number of "papers." In extreme cases, scientists' productivity is even measured by the number of pages published. Under these conditions, for a large number of scientists, certainly for the overwhelming majority, except for truly exceptional ones who have the chance to have a remarkable talent or to be in a social position and mindset that allows them to free themselves from these feelings of constraint, for most, scientific research is a true constraint that kills the pleasure that one can have in conducting it.

This is something I discovered with astonishment because it's not talked about. Between my students and me, I thought there were spontaneous and equal relationships. In fact, it's an illusion in which I was trapped; without even realizing it, there was a real hierarchical relationship. The mathematicians who were my students or who considered themselves less well-off than me and who felt, let's say, alienated in their work, would never have thought to talk to me about it before, of my own accord, I left the scientific ghetto in which I was trapped and tried to speak with people who were not from my environment; this environment of esoteric scholars who were doing advanced mathematics.

To illustrate this point, I would like to give a very concrete example here. Two weeks ago, I went to Brittany for a visit. Among other things, I had the opportunity to go to Nantes where I saw friends and spoke at a Youth and Culture Center (MJC) about the kinds of problems we are addressing today. I was there on Monday. Since the colleagues from the University of Nantes were informed of my visit, they had asked at the last minute if I could come the next afternoon to talk about mathematical topics with them. However, on the day of my visit, one of the mathematicians from Nantes, Mr. Molinaro, committed suicide. Therefore, due to this unfortunate incident, the planned mathematical talk was canceled. Instead of this, I then contacted a number of colleagues to ask if it was possible to meet to talk a little about mathematical life within the mathematics department at the university and also to talk a little about this suicide. There was an extremely revealing session of the general malaise that afternoon in Nantes, where clearly everyone present — with one exception, I would say — felt very clearly that this suicide was very, very closely linked to the kind of things we were discussing the night before at the MJC.

In fact, I will give maybe one or two details. It turned out that Molinaro had two doctoral students whom he had done third-cycle theses — I don't think they were state theses. However, these theses were considered not to have sufficient scientific value. They were judged very severely by Dieudonné, who is a good colleague of mine and with whom I have written a large treatise on algebraic geometry. So, while these theses were being discussed by the Commission for admission to higher education functions, he rejected them and admission was refused. This, of course, was felt as a kind of personal affront by Molinaro, who had already had difficulties before and he committed suicide under these circumstances. In fact, I had a mathematician friend, Terenhôfel, who also committed suicide. I know a number of mathematicians — I am mainly talking about mathematicians here since it is the milieu I have known best — who have gone insane.

I don't think this is something unique to mathematics. I think the kind of atmosphere that prevails in the scientific world, whether it is mathematical or not, a kind of atmosphere that seems extremely rarefied, and the pressure that is exerted on researchers are a lot of what is behind the evolution of these unfortunate cases.

This concerns the pleasure we take in scientific research. I believe there can be pleasure, but I have come to the conclusion that the pleasure of some, the pleasure of those in high places, the pleasure of the brilliant, is at the expense of a true repression of the average scientist.

Another aspect of this problem that goes beyond the limits of the scientific community, of all scientists, is the fact that these high flights of human thought are at the expense of the entire population, which is dispossessed of all knowledge. In this sense, in the dominant ideology of our society, the only true knowledge is scientific knowledge, which is the preserve of a few million people on the planet, perhaps one person in a thousand. All others are supposed to "not know" and, in fact, when you talk to them, they have the impression of "not knowing." Those who know are those who are up there, in the high sciences: mathematicians, scientists, the highly knowledgeable, etc.

So, I think there are quite a few critical comments to be made about this pleasure that science gives us and its offshoots. This pleasure is a kind of ideological justification for a certain course that human society is taking and, as such, I even think that the most disinterested science being done in the current context, even the furthest from practical application, has an extremely negative impact.

This is why, personally, I currently abstain from participating in this kind of activity as much as possible. I would like to explain why I initially interrupted my research activity: it was because I realized that there were urgent problems to be solved concerning the survival crisis that it seemed crazy to waste resources on pure scientific research. At the time I made this decision, I thought I would spend several years doing research, acquiring some basic knowledge in biology, with the idea of applying and developing mathematical techniques and methods to address biological problems. It is absolutely fascinating to me and yet, from the moment friends and I started a group called "Survive", precisely to deal with survival issues, from that moment on, my interest in disinterested scientific research completely disappeared for me and I have never regretted it since.

There remains the second motivation: science, scientific activity, allows us to have a salary, allows us to live. This is actually the main motivation for most scientists, according to conversations I have had with a large number of them. There would also be a lot to say on this subject. In particular, for young people who are currently entering the scientific career, those who study science imagining that they will find a ready-made job that will provide them with security. I believe it is generally well known that there is a great illusion there, as a result of producing highly qualified people, we have really produced too many since the big boom in the production of young scientists, since Sputnik about fifteen years ago, and there is increasing unemployment in scientific careers. This is a problem that is becoming increasingly acute for a growing number of young people, especially young scientists. In the United States, something like 1,000 or 1,500 theses in

mathematics alone must be produced every year and the number of job opportunities is roughly one-third of that *.

On the other hand, it remains that when science allows us to have a salary and provide for our needs, the links between our work and the satisfaction of our needs are practically severed, these are extremely abstract links. The link is practically formed by the salary, but our needs are not directly related to the activity we carry out. In fact, that is the remarkable thing, when we ask the question: "what is the social purpose of science?", practically no one is able to answer. The scientific activities we do do not directly serve to fulfill any of our needs, nor the needs of people we may know. There is perfect alienation between ourselves and our work.

This is not a phenomenon that is unique to scientific activity, I think it is a situation that is specific to almost all professional activities within industrial civilization. It is one of the great vices of this industrial civilization.

As far as mathematics are concerned, I have been trying for some months now to discover a way in which mathematical research, that which has been done for centuries - not necessarily the most recent mathematical research, in which I was still involved myself until fairly recently - could serve the satisfaction of our needs. I have spoken to all sorts of mathematicians for three months. Nobody has been able to give me an answer. In audiences like this one or in smaller groups of colleagues, nobody knows. I would not say that none of this knowledge is capable, in one way or another, of being applied to make us happy, to allow us to flourish better, to satisfy certain true desires, but so far I have not found it. If I had found it, I would have been much happier, much more content in certain respects, at least until recently. After all, I am a mathematician myself and it would have pleased me to know that my mathematical knowledge could serve something socially positive. However, in the two years that I have been trying to understand a little bit about the course that society is taking, the possibilities we have for acting favorably on this course, particularly the possibilities we have for allowing the survival of the human species and for allowing an evolution of life that is worthy of being lived, that survival is worth it, my scientific knowledge has not served me once.

The only point on which my mathematical training has served me is not so much my mathematical training as such or my name as a mathematician, but that, since I was a known mathematician, I had the possibility of being invited by quite a few universities everywhere. This gave me the opportunity to talk with many colleagues, students, and people everywhere. This happened for the first time last spring when I toured Canada and the United States. In the space of three weeks, I visited about twenty campuses. I have gained enormous benefit from these contacts; my ideas, my vision of things have evolved enormously since that time. But it is therefore quite incidentally that

my quality as a mathematician has served me; in any case, my knowledge as a mathematician was really of no use.

I could add that since last spring, when I receive an invitation to give mathematical talks somewhere and accept it, I make it clear that it only interests me to the extent that such a presentation gives me the opportunity to discuss more important problems, like the one we are discussing here. In general, this also gives me the opportunity to talk with non-mathematicians, scientists from other disciplines, and also with non-scientists. That is why I ask my fellow mathematicians that at least one person in the department take care of organizing such debates. This was the case, for example, for all the conferences I have given in Canada and the United States. So far, no one has refused this proposal to organize non-technical, non-purely mathematical debates, in addition to the traditional mathematical invitation.

Furthermore, since that time, I have also slightly modified my practice by introducing preliminary comments in the mathematical presentations themselves so that there is not too sharp a division between the mathematical part of my stay and the other part. So, not only do I announce the general public debate that takes place afterwards, but I also distance myself from the practice of inviting foreign speakers to perform a certain ritual — namely, to give a high-level lecture on a great esoteric subject in front of an audience of fifty or a hundred people, of whom perhaps two or three can painfully understand something, while the others feel truly humiliated because they feel a social constraint to attend.

The first time I asked the question clearly was in Toulouse a few months ago, and I actually felt a kind of relief that these things were once said. For the first time since I had been giving this type of lecture, spontaneously, without anything being agreed in advance, after the mathematical lecture which was actually very esoteric and which, in itself, was very painful and burdensome - I had to apologize several times during the lecture because it was really quite unbearable -; well, immediately after, an extremely interesting discussion was established precisely on the theme: "What is the point of this kind of mathematics?" and "What is the point of this kind of ritual that consists of giving lectures to people who are not rigorously interested in it?".

My intention was not to make some sort of theory of anti-science. I see well that I have barely touched on some of the problems that are related to the question "Will we continue scientific research?," even among those that were listed on this tract of which I saw a copy. For example, on the possibilities of developing a scientific practice entirely different from the current scientific practice and on a more detailed critique of this practice.

I spoke for about half an hour, in fairly concrete terms, about my personal experience and what has been directly passed on to me by others. This is probably sufficient; perhaps it would be better for other points to be discussed in more depth during a general discussion.

Before I finish my introductory speech, I would like to indicate that I have brought a few copies of a journal that we publish called “Survivre et Vivre” (Survive and Live). This is the group I mentioned at the beginning, which has changed its name in recent months. Instead of simply surviving, after a significant change in perspective, it has become about surviving and living.

At first, we started with the fear of a possible end of the world, where the essential imperative for us was survival. Since then, through a parallel process among many of us and others outside of the group, we have come to a different conclusion. At first, we were, so to speak, overwhelmed by the multiple extremely intertwined problems, in such a way that it seemed impossible to touch on any of them without also bringing up all the others. Finally, we would have given in to a sort of despair, of black pessimism, if we had not made the following change in perspective: within the usual system of reference where we live, within the type of civilization given, let's call it Western civilization or industrial civilization, there is no possible solution; the interweaving of economic, political, ideological and scientific problems, if you will, is such that there are no possible solutions.

At first, we thought that with scientific knowledge, by making it available to enough people, we could arrive at a better understanding of the solution to the problems that arise. We have now dispelled that illusion. We now believe that the solution will not come from an additional amount of scientific knowledge or an additional amount of techniques, but rather from a change in civilization. This is the extremely important change in perspective. For us, the dominant civilization, industrial civilization, is doomed to disappear in a relatively short time, perhaps in ten, twenty or thirty years... one or two generations, in that order of magnitude; because the problems posed by this civilization are indeed insoluble.

We now see our role in the following direction: to be ourselves an integral part of a process of transformations, of the ferments of transformations from one type of civilization to another, which we can begin to develop right now. In this sense, the problem of survival for us has been, so to speak, surpassed; it has become that of the problem of life, of the transformation of our life in the immediate present; in such a way that it concerns ways of life and human relationships that are worthy of being lived and that, on the other hand, are viable in the long term and can serve as a starting point for the establishment of post-industrial civilizations, new cultures.

Discussion

Question •

— I would love to know what you think makes life worth living.
lived.

Answer •

— In fact, until now, the activity, the life that I had, I considered it quite worth living. I had the feeling of a certain type of personal fulfillment that satisfied me. Now, looking back, I view my past life in a very different light; in the sense that I realize that this fulfillment was at the same time a mutilation. Indeed, it is an extremely intense activity, but in a excessively narrow direction. In such a way that all the others development possibilities of the person are not affected. For me, there is absolutely no longer any possible doubt on this subject. The kind of activity that I currently have is infinitely more satisfying, more enriching, than the one I had for twenty or twenty-five years of my work as mathematical researcher. This is a very personal point, as concerns my own life.

But, on the other hand, when I speak of a life that is worth living, it it's not just about my own life, it's about everyone's life. And I realize that the fulfillment that I have been able to achieve in a direction very limited was done at the expense of the possibilities

fulfillment

other people. If some people have found themselves under a psychological pressure so strong that they have sometimes come to suicide, it is indeed because of a dominant consensus which meant that the value of the person was judged, for example, on his technical virtuosity at demonstrate theorems, i.e. perform operations excessively specialized — whereas, precisely, all the rest of the no one was left completely in the dark. It's one thing that I have

- 20-

experienced many times. When we talk about a certain person and I asks "Who is it? ", I am answered" It is an idiot. » Meaning by there, between mathematicians, that it is a type which either demonstrates theorems which are not very interesting, either proves theorems which are false, or prove no theorems at all.

So here I have defined somewhat negatively what I mean by a life that be worth living. I think, for everyone, there is possibility fulfillment without being judged by others, by such narrow, such narrow criteria. In fact, I think this scale of values has a directly mutilating effect on the possibilities of flourishing. Finally, it is one of the aspects, I do not claim to answer here to the question raised which is very broad; but in the perspective where we place here, starting from scientific practice, this is what I see more immediate to respond.

Question ·

— What are your views on the structure of scientific research in the People's Republic of China?

Answer ·

"Until fairly recently, say until about three months ago, I was quite closed to all the information that came to us from China because they wrapped themselves in a jargon such as one wanted, a priori, to question them — we didn't want to take them seriously. the jargon of, say, a rampant personality cult of Mao Tse Tung, a kind of hagiography that accompanied it, made me read these publications quite often, but that they fell from the hands of discouragement. it did not pass. So, three months ago, I met the New Alchemists 6 that made me understand the possibility of a scientific practice entirely different from that which prevails currently in all the sciences which are taught at the university and in research institutes, from that moment on, indeed, I attached a renewed interest to what is happening in China and I had the motivation to go beyond, say, the frills of style and to try to see the bottom of things. Thus, I have convinced myself that there are extremely interesting things that are also happening in China, precisely in the direction of the development of a new science. In all case, China is the only country in which the myth of the expert is officially defeated, in which people are told "don't trust

6 NdE. The New Alchemy Institute is a group of agrobiologists founded by Dr. John Todd and Dr. William McLarney located in Woods Hole, Massachusetts, USA (Nancy Todd, *The Book of the New Alchemists*, ed. Dutton, New York 1977).

- 21 -

not to the experts", "don't wait for the government to send you types competent to solve them yourself", "solve them yourself even with the means at hand, with the means you find on square".

Whether we are university professors, workers or peasants, we are all capable of creative initiatives, we are all capable of inventing something. I believe that the most which these...let's call them "watchwords" or this movement new have materialized, it is in the development of medicine Chinese. Especially since the Cultural Revolution. It's an example where, precisely, science comes out of the hands of a certain caste to become everyone's science and only by becoming everyone's science that it can become science for all. In fact, almost any who can become a doctor, regardless of their cultural background. This vast movement of "barefoot doctors" has mobilized a number impressive number of people — but I'm bad at statistics and I don't know how many Who roam the countryside for all kinds of simple medical interventions that would only be allowed after years and years of medical studies in a social context like ours. While there, after a few months of preparation, we

may perform certain medical activities.

Of particular note is the sensational development of Chinese acupuncture, which has made it possible to cure certain ailments in completely unsuspected cases until now, or of being, for example, auxi

linked to certain medical techniques. We know the role played currently Chinese acupuncture in anesthesia. acupuncture also helps to cure all kinds of ailments, including conditions as commonplace as colds, but also, for example, very serious affections like descents of matrix to very states advances. I recently had the translation of an article from a Chinese newspaper in this subject which enlightens us well on the differences between, say, the practice science and especially medical practice in Western countries such as France or Switzerland and the practice in China where a technique completely new healing from a very advanced matrix descent has was found by a young female doctor who had very little education behind her, but who was strongly motivated to cure a specific case. On the other hand, she found herself in a cultural climate where it is not considered inadmissible, unthinkable, that a person with little knowledge, having practically no diplomas, can develop new techniques. She did some tests on herself in making injections on her own lower vertebrae since she knew, from the few elementary things she had learned, that there was

direct nervous links between the matrix and these vertebrae and by dint of experimentation on herself, she ended up finding a point that caused an extremely strong reaction that caused him to ascend the matrix to inside her belly. Thereupon, being convinced that she had found the correct point, she did the same operation on the patient she had in seen and this patient was cured. Since then, according to this newspaper, a fifty other cases would have been treated with forty five cases of healing.

We can see here the fundamental difference between this kind of practice and scientific discoveries and those prevailing in the countries Westerners. First of all, the patient is no longer an object in the hands of the doctor ; it is no longer the doctor who is the subject who knows and who applies his knowledge of the diseased object. Here, in scientific investigation, the doctor is at the same time the object of experimentation, which, at the same time, allows him to overcome this intolerable relationship for the patient to be precisely an object without will, without personality, between the hands of the doctor and, at the same time, which allows, I believe, a knowledge much more direct, much more intense of what is happening.

When one feels scientific research in one's own flesh, when one feels oneself the reactions of the body, it is a knowledge completely different from doing something to a diseased object and that some needles, or others, record reactions in a way purely quantitative. I think there's a set of factors here where rational faculties of the person are no longer separated from each other.

others, where they are no longer separated, for example, from the experience direct sensory, or affective, ideological motivations, call them As you want.

So I think that there is a real integration of our different cognitive faculties, of our faculties of knowledge, which truly lacking in mainstream, Western scientific practice. Here at contrary, we do everything to separate at all costs the faculties purely rational and all the rest of our possibilities of knowledge. This is, among other things, one of the factors that led to this kind of delirium technology that makes scholars capable of fascinating on technical problems, such as those posed by the construction of missiles intercontinental or other similar things, without at all asking the question of the excruciating implications of the eventual use of what they are building.

Question •

— According to you, society should be changed into a post-industry in ten or twenty years. I even grant you fifty years. I

- 23 -

asks you the following. Suppose a fairy grants you a unlimited power to persuade everyone to do what you think what to do. What will you do without causing a great catastrophe, say, starvation, etc. ?

Answer ·

— I believe there is already a basic misunderstanding. I didn't say you have to that anyone, in particular, or anyone else, me for example, transforms industrial society, like that, in the ten, twenty or thirty coming years in another form of predetermined society. If a fairy invested me with discretionary powers, I would tell her that I have none not want. Indeed, I am quite convinced that what I could do, it would hardly be anything other than putting even more mess, brothel, than the one who is already there

to. In fact, I am fully convinced that absolutely no one is able, let's say, to program, to predict the changes that are going to take place. I think the complexity of the problems planets is so large that it absolutely defies the ability to analyze mathematical or experimental. We are in a situation where the methods of the experimental sciences are practically of no use to us nothing. Because, ultimately, a planet Earth, there is only one and one situation like a crisis situation where we are now does not take place only once in the history of evolution. So we don't have there an experiment that we can repeat at will to see that they go be the consequences of such and such an operation, so as to then optimize our operational methods. There is absolutely no question of this. This is a unique situation, of a complexity that exceeds infinitely our possibilities of detailed analysis and prediction.

All we can do, I am sure, is that, each in our own sphere of activity, in our own environment, we tried to be a ferment of transformation in the direction which, as judged, intuitively, seems to us the most appropriate, starting with the human relationships with our loved ones, the members of our family, our children, our wife, our friends, also our work colleagues. I am convinced that it is a first transformation which has the advantage of being communicative, to communicate with each other.

Among the transformations to be carried out, there are more particularly, going beyond the attitude of competitiveness between people, the overcoming the attitude or desire for domination of some over to others which on the other hand engenders the desire to submit to authority — moreover, we have here two aspects of the same tendency — and above all the establishment of communication between people which has become

- 24 -

extremely poor in our civilization. I did quite recently the assessment of my own life and of the human relationships I have had, and I have been struck how poor the actual communication was.

For example, in a mathematical environment, between colleagues, conversations essentially revolve around technical subjects concerning the mathematical. I had a number of romantic relationships in my life, like probably most of you, and here too I felt insight into how true communication, knowing one of the other was poor. I am absolutely convinced that this is not a

particularity linked to my person because I would personally be less good at communication than others. In fact, this is a general phenomenon in our culture and indeed speaking with many other people, I have made observations completely analogous. For my part, for example, I made this general decision not to pursue romantic relationships with a woman only to the extent where they would seem to me to be a means of establishing communication deeper. If you want, it's just a particular example of a way in which each of us can immediately transform the way which he approaches others. Likewise, I can tell you that my relationships with my children have changed; in the sense that I understood that, in many occasions, I exercised a rather arbitrary authority over them say, on things which, in good conscience, were of their own competence. So those are things that can be changed.

One may wonder, at first glance, how this type of change is it related to, say, global issues of survival. I'm sure, but I can't prove it because nothing important can be proven; one can simply feel it, guess it. But I'm convinced that indeed these changes in human relations are going to be a absolutely determining factor, perhaps the most important, in the changes that will take place from one mode of civilization to another. Again, it has now become quite clear to me that these changes will not be made by virtue of technical innovations, structural changes. The truly profound change that will to be done is a change in mentalities and human relations.

Question ·

— I would like to come back to scientific research. You're actually talking about deviations from scientific research. I partially agree with some of your diagnoses· the fact that we seek too much glory personal, the enslavement to fashion, the abusive pretensions of some scientists, etc. But is this inherent in science? Science,

- 25-

in my opinion, would like to build a new vision of the world. What purpose would you give to another practice

a scientist?

Answer ·

— When we say inherent in science, inherent in what science? I think that it is inherent in science as defined by the practice of last centuries, as it has developed since the beginning of science exact. I think it is inherent in the very method of these sciences. Among the distinctive features of this scientific practice, there is a first point which is the strict separation of our rational faculties and other ways of knowing. So an instinctive distrust of all that is, let's say emotivity, of all that is philosophical, religious knowledge, of all that is ethical consideration, of all that is felt, sensory, direct. In this sense we have more confidence in the indications

of a needle on a dial, that in what we immediately feel,
directly.

The following example measures very well this distrust vis-à-vis the experience immediate; I could cite many others, but this one seems to me particularly striking. This is the case of parents who go to see with their child a doctor saying to him: "We are very unhappy, our child becomes more and more impossible in class, he is a kleptomaniac, he fight with everyone, with us there are still days to sulk whole, he wets the bed, etc. And they ask the question, "Does our child is sick? We therefore ask the specialist, the person who knows, to pronounce a ritual formula: "Your child is sick" or "Your child is not sick". In the case "Your child is sick", he is expected to prescribe a drug, method of treatment, something that will make him return to the other state, the case "Your child is not sick" and that will be it. But if, by chance, he says: "Your child is not sick", the parents, a little consoled, will go away at home and will have the impression that there is no problem. Actually. This is, I believe, one of the ways of illustrating this state of mind in the science, to want to disregard lived experience and state everything in terms of purely rational norms which are expressed, which are embodied by specialists.

We thus come to the second point, the second flaw in the method, which is inherent in the scientific method. It is the analytical attitude which, of course — I know it well — was necessary for the development of this type of knowledge. Dividing every bit of reality,

each problem into simple components to better solve them and
this tendency towards specialization, as we know, has become more and more

- 26-

bigger. Each of us grasps only a tiny fraction of reality.
Which makes each of us utterly powerless to grasp,
to understand and to take options in any
important matter in his life, the life of the community or the life of the
world. Because any important question has an infinity
of different aspects, its cutting into small slices of specialties is
completely arbitrary, and what a specialist alone cannot do,
a symposium of one hundred specialists of different specialties will not succeed
neither.

Finally, by its own internal logic, by the evolution of
analytical method, we have reached a point where, I believe
that independently of the question of the ecological crisis, there is a crisis of
the knowledge. In this sense I believe that, if there had not been the crisis
ecological, in ten or twenty years we would all have noticed that there is a
profound crisis of knowledge, even in the sense of knowledge
scientific. In the sense that we can no longer integrate into a coherent image
a vision of the world — since after all that is what we want
arrive — , at a vision of reality that allows us to interact in a way
favorable with it from our specialty small slices. It's a
second aspect which seems to me to have become harmful.

There is a third related to this one. It is that the specialties are ordered spontaneously in relation to each other, according to objective criteria of subordination to each other; in such a way that we see appear a stratification of society beginning with, say, a stratification of science, according to so-called objective criteria of subordination of specialties to each other. In this sense, science in its present practice as it has developed over the past three hundred or four hundred years, seems to me to be the main ideological support of the stratification of society with all the alienations that implies. I believe that, in this sense, the scientific community is a kind of microcosm that fairly accurately reflects the trends within the global society.

Furthermore, the fourth point is

t the separation in science between knowledge on the one hand and desires and needs on the other hand. The knowledge science develops according to, supposedly, a logic internal to the knowledge, supposedly, of the objective criteria for the pursuit of the knowledge. But in fact, moving further and further away from our needs and our true desires. The most striking thing in this respect seems to me be the state of relative stagnation in which agriculture finds itself, for four hundred years that the exact sciences have been developing, when we compares with booming branches such as mathematics,

physics, chemistry or more recently biology. Agriculture after all, has been the basis of our so-called civilized societies for ten thousand years. It is truly the core business of the company, that's where we get most of the resources to satisfy our material needs. We would have been able to think that with the development of methods of knowledge new, they would be applied as a priority to agriculture for us allow us to be released, to a certain extent, from this obligation excessive work to satisfy our basic needs. He has none nothing been. Even today, I believe that for most of us, agriculture is not considered a science. It would seem unworthy of a brilliant mind to occupy himself with agriculture. But, precisely, with new scientific techniques, the first thing to ask is: "what can science be used for, the content of science that we are we developing? » I think that among the most important themes that will be studied by a new science, there will be precisely the development of new and much more efficient agricultural techniques and above all much more viable in the long term than the techniques that have been used so far.

Here, then, are some criticisms of current scientific practice.

From what I've heard of some attempts one way innovative, I am convinced that these limitations of the current science, that we can therefore develop a science that is directly and constantly subordinate to our needs and desires; in which there is no longer any arbitrary separation between the activity science and all of our ways of knowing, where there would be no no more arbitrary separation between science and our life. At the same time

also, the human relationships that are promoted by scientific activity would change completely. Science would no longer be the property of a caste of scientists, science would be everyone's science. She wouldn't not in laboratories by some highly regarded people at exclusion of the vast majority of the population, it would be done in the fields, in the gardens, at the bedside of the sick, by all those who participate in production in society, that is, in the satisfaction of our real needs, that is to say in fact by everyone.

So science truly becomes everyone's science. For the New Alchemists, this group to which I have already alluded, is even a technical necessity. Indeed, their intention, their theme of departure, it was to develop biotechniques which allow, with extremely rudimentary means not calling on the hyperstructure industrial and technological, to create artificial ecosystems very food producing. Technological means in the ordinary sense, for example the introduction of a continuous source of energy [electricity], or

- 28-

the supply of food by chemical industries (fertilizers or feeds that would be given to livestock, to fish), can be replaced by a sophisticated and global knowledge of the phenomena natural within these artificial ecosystems. To do this, they convinced that it was unthinkable to do it inside the structures existing academics; in fact, it was not possible even to do so at inside closed laboratories; we could only do it on the ground,

because it was necessary to take into account in the development of these techniques subtle ecological factors that vary enormously from one microsystem ecological to another — and there are thousands and tens of thousands in a country such as the United States where they continue their activities.

So, to succeed in developing these methods, it is in the field that must be developed and that everyone must be associated with them virtually. The New Alchemists connect with millions of Americans interested in agrobiological, "Organic gardening and farming", organic farming and gardening, through their magazine Organic gardening and farming magazine. Among these

, there are already thousands of little people, little peasants, little gardeners, who gave them written to be associated with their research concerning the development of such ecosystems. So right now it's not just about ideas in the air, but of things that are being done in a country as radically opposed to this kind of spirit than the United States. Once again, by concrete details of which spoke to me John Todd, one of the founders of the New Alchemists, it is absolutely not possible to promote this kind of research within existing academic structures. They have tried, but it is impossible.

Question ·

— Although 99% of the population does not have access to science, we must notice that she has a greater respect for science than you do and that's

based on a fact that is not simply due to his ignorance. For example, one can ask the question • "how many people in this room must live to the fact that there was this science that you are describing? » That there have been repercussions in medicine, for example, which are not acupuncture, which are not rising matrices, but are simply penicillin and a number of decisive things that made the population of the globe rise. A number of us, we live, your group is called "live", we live because there was this science cursed.

It is true that we risk destruction and it is natural that there is a reflection on what science is today in the hands of types who

- 29-

seem to arise from the depths of the ages, because they are barbarians who are ready to use it to destroy humanity. It's true. But I find in you that part of this reflection is destroyed by the kind of nihilism absolute, of absolute negation, which you profess with regard to science.

I noted in your presentation a number of statements peremptories that remove some of the weight from your position •

- You expressed the doubt, it is based on the relations you have with certain people at CERN, that the research that we can do, we by example, has no military application. It is something that we can perfectly in doubt. We must be, maybe, all completely

idiots 1 , but I don't think so. Really, I don't believe that colleagues would take the slightest risk to come and say to us. "How does what we do we risk having military applications? And it makes me come to something that seems essential to me.

- We asked the question. "What is mathematics for?" He must continue. what is the use of music? what are a number used for activities that people do simply for fun?

- Finally, what is your conception of man? It is true that a certain many people have activities that the masses do not have access to, but I don't think it's deciding that Mr. Einstein shouldn't do research or that Mr. Evariste Gallois must not carry out research that you will get to enrich the lives of people who are neither Welsh nor Einstein. He there are problems that are posed for people who are neither Welsh nor Einstein and who are in large institutions in which the organization of research in an industrial way poses problems considerable, considerable anguish.

But I find that with your total rejection of science you join Planète, you join a certain number of..., you see what I think..., you join a certain number of obscurantists. I apologize, as I get you in the stomach for the first time, I can't criticize your positions, but there are many things about you that deserve a debate.

Answer •

"If you allow me, I will say a few words about your

intervention.

7 Alas! Neither more nor less than the Nobel Prize winner E. Rutherford who saw in 1932 "no species of practical application to research on the atom. [NdE. Note without indication of origin.]

- 30-

So you accuse me of anti-science nihilism. In fact, it's true that insofar as science is understood to mean scientific activity as it is currently exercised, I have come to the conclusion that by many aspects, it is one of the main negative forces at work in the actual society. This was probably not the case two hundred years ago and perhaps not even be the case a hundred years ago. Currently I believe that the situation at change a lot. But again, as I said earlier, I think that current scientific activity is likely to change very very deeply; I think this will not happen without most of the current scientific sectors are simply withering away. I am quite convinced that the research

are current where we begin to catalog elementary particles corresponding to such and such operators in Hilbert space, or mathematical research in which I have been involved until now will wither away, not by a authoritarian decree of me or no one else, but spontaneously. And this when the current structures of society are about to crumble, when the cogs will no longer work, because the mechanisms of society

industrial, by its very normal operation, are self-destructive; they destroy the environment and luckily for us I would say. Of such so they can't keep running indefinitely, they set in motion irreversible processes. Then there will be collapse of our current lifestyles. When our cities, for example, crumble, when no one will pay the salaries that allow us, thanks to an esoteric scientific activity, to go and buy the provisions which we need in the shops, to buy clothes, to pay our rents, etc — and even if we had the money, this money would not serve us nothing because the food, we will have to pull it out of the earth by our own resources, because there won't be enough of them — at that point, the motivations to study elementary particles will disappear entirely.

I myself was quite a fanatic, so to speak, of research. I was really very captivated, there are noble passions. But even supposing that the rest of physicists — despite extremely strong pressure from material necessities for survival — who would dream of continuing the research, we must not forget all the same that an accelerator of particles is not made with a few pieces of wood; it is something that involves considerable social effort and I highly doubt that other members of society are willing to distract activities truly necessary to establish a viable world, worthy to be lived, to rebuild particle accelerators and things analogues. In any case, I believe that, for accelerators and other gear of this kind, the general public has never been consulted. Moreover, I add that

if he had been, probably he would have been in such a way that he would have said "Amen! ".

After the lessons that each of us who survives can learn from events that will accompany the collapse of industrial society, I think that mentalities will have changed very profoundly. It's for this reason that scientific research will cease, it will not be because such and such will have decided authoritatively that we will no longer make scientific research from today. It will just cease, as something which, by general consensus, will have become completely uninteresting. We will no longer want, simply, I am persuaded to do it, that does not mean that we will no longer want to do short search. Research, our creative activities, will be directed in quite different directions.

I am thinking, for example, of the kind of research that are being pursue the New Alchemists with thousands of little people who do not have a university education. These are fascinating things will engage the creativity of each of us in such a profound and perhaps as satisfying as today's ultra-specialized work in laboratory.

We were brought up in a certain ambient culture, in a certain reference system. For many of us, according to packaging received from primary school in fact, we consider that

society as we know it is the ultimate outcome of evolution, the ultimate. Finally, this is the case for the majority of scientists. But we forget that there were hundreds and thousands of civilizations before ours, with different cultures, which were born, which have lived, which have flourished and which have died out. Our civilization, or the industrial civilization — because I no longer consider it the mine — , will be no exception.

One thing that goes beyond this remark, in my view, is to realize that this is a process that is really ahead of us, in which we are already engaged now. In fact, the ecological crisis, the crisis of civilization, it is not something for in ten years or in twenty years. we are in it. I even believe that there are more and more people who notice it; it's something that strikes me more and more more throughout the last few months and weeks, at what not people in whom we least expected it begin to feel it. We scratch a tiny bit below the superficial things they say and we realize that there is real disarray

concerning, say, the global sense of the surrounding culture.

- 32-

So here is regarding the charge of nihilism. So there is some truth into it if it is applied to a certain form of scientific activity. I have somewhat forgot the other objections you were making?

Question ·

"We owe life to science!"

Answer ·

"I think there are some useful things to say about it. Supposing that some here owe their lives to science, we can say that there are hundreds of thousands of people in Vietnam who also owe their deaths, and their deaths under atrocious conditions, to this same science. This is an argument not easy because there are many people who say· "Science has been misused, the remedy is to always do the same kind of science, but to put it now in the hands of people who will use it good. We will be told, for example, that medicine, research biology, etc., this is the type of science that is used mainly in a beneficial. So, again, there is an easy way to answer it by saying· the same kind of fundamental research in biology which, through work of engineering will, for example, be used to develop vaccines against poliomyelitis or against other diseases, this same kind of research fundamental, through other engineering work, will be used to produce strains of highly pathogenic microbes, highly resistant to all anti-biotic and which will be used for bacteriological warfare. So, in the end, research has no smell and whatever the intentions of one who promotes a certain type of research — at least the type of research that is currently being promoted within our science traditional — experience has shown that it can always be diverted and diverted.

As I have given here the example of bacteriological warfare, we could say that the two examples are somewhat of the same type. In the sense that we can consider them as related to an accident, namely, the existence of military apparatuses, the existence of antagonistic nations. But suppose may these difficulties be eliminated, may the dream of the citizens of the world be realized, that there is a world government. Or suppose that the United States, Russia or China, as you choose, has absorbed the whole of the planet, that there is only one country left. Or suppose the planet is smaller than it is and that it is made up only by the United States, or suppose that the United States, through an isolationist policy extreme manage to live in a vacuum, and let's look at what's going on there. I claim that in fact the problems are deeper than that, than the

- 33 -

essential problems still arise even if there were no longer military issues.

Let's take, for example, the antibiotics that you mentioned, specifically because they actually save human lives. what do we see, for the use of antibiotics? We see that when we have the slightest cold, any ailment whatsoever, we will to the doctor. What does he prescribe for us? He prescribes us antibiotics. In fact, for simple fatigue, very often, he prescribes antibiotics. He seems to be caught under a kind of social pressure, know, his client expects him to prescribe each time the remedy that

is likely to bring about an improvement as soon as possible.

This without prejudice to what will happen in the long term. But, anyone what biologist will tell you, you don't have to be a great genius for that and even I know it well that I am not a biologist, the fact of using routine title of antibiotics is a real misinterpretation. Indeed, by this practice, we contribute to the formation of strains of microbes in our body that will develop resistance, precisely to antibiotics we take. So that, in cases truly severe where urgent intervention with antibiotics would be likely to save our lives, we risk staying on the floor [NdE.

The increase in resistances is only now recognized by the public authorities, advertising campaign "antibiotics are not automatic" at the end of 2004]. Now, we are in a situation where it is difficult to assess the benefits or advantages that there have been in the use of antibiotics. What takes precedence over the other• does the tens of thousands of lives that have been saved by the use of antibiotics weigh more in the balance than, say, the millions of organisms that have been weakened in their natural resistance to agents microbes through the careless use of antibiotics?

I will not settle this problem, but I would simply say that here the question is not a technological question, it is not p

have a question about

knowledge. It is quite clear that biologists have the knowledge necessary to decide, as of now, that the use made of it by doctors, in the clinic and in their daily practice, is nonsense. It is

a matter of lifestyle. It is a matter of civilization. In fact, I don't not saying that antibiotics must necessarily be banned in a society ideal future. Antibiotics are fungi that can be produced with extremely rudimentary means, without using the large superstructures of heavy industry. We can therefore very well use antibiotics in a highly decentralized society in which municipalities of a few hundred or a few thousand inhabitants would live in relative autarky. It is quite possible and probable that the

- 34-

antibiotics will continue to be used in post-industrial, in some at least. It's not because they were produced in our current Western scientific culture that should be put a general ban against this kind of process. I believe there is a need to judge on documents and that it is not a theoretical work to be done now, namely, to separate the wheat from the chaff in all of our scientific knowledge and techniques currently available. It is, I believe, a job that will be done day by day, according to the needs of time. That is to say, it is a job that will not be done by a few specialists, biologists, doctors, psychiatrists, physicists, etc. It will be done by everyone as needed. We'll see what we have need in the great mass of scientific knowledge of which I am convinced that most of it is perfectly unusable and will completely wither away.

Question •

— What about relations between CERN and the military?

Answer •

“I don't have any secret information about it. I wasn't pretending speak of, say, real relations, official or occult, between CERN and military devices. I don't know of such things. I wanted talk about the image that the name of CERN has on a large part of the public more or less cultivated, for example myself. The name already• European Center of Nuclear Research. The fact that it is an organization that brings together a certain number of countries, the prestige which is attached to it and which you will not deny probably not; also the fact that it is research concerning at least the atom, even if it is not "nuclear research" and this, linked to the concern, to the growing worries in the public vis-à-vis vis, precisely, of the atom, including the peaceful atom, all this creates a certain resonance concerning CERN that cannot be denied. To that close that, as far as I am concerned, anyway, the kind of research, the kind of scientific practice that is pursued in CERN, as in any other current scientific institution — but even more because, despite everything, of the general connotations of atomic research with the perils linked to our survival — all of this has the effect of creating a embarrassment, I believe, for many and for me in particular.

Question •

"And Evariste Galois?"

Answer •

"He's dead, poor thing.

- 35-

Question •

— You have pointed out many bad things and I agree with you, they should be changed. The question is: "What is the related to science? You point out that many scientists are greedy, crave honours, steeped in hierarchy, etc. East- this really different among artists, farmers, politicians and others? Likewise, you point out many deplorable things about the human level: people commit suicide or are going to commit suicide, have depression nervous. Here too, is it otherwise among politicians, men business, etc., and is science responsible for these misfortunes? Is it only science that makes people greedy or suicidal?

And, to take an example, there have been poets who have written very beautiful things without having any communication, say, with their wife. Do you think that again science is really responsible for this lack of communication ? I think it's kinda natural human and that is bad. We have to fight against it, but it hasn't nothing to do with science.

And finally, about the wars, about Viet-Nam. We are all agree that this is a tragedy. But is science responsible for this? I

mean, three thousand years ago, do you think that was fundamentally different? Thank you.

Answer •

— I completely agree with you that most of the aspects of scientific practice that I have highlighted — a certain number at least — are not

not specific to research settings

scientific. I don't think there are necessarily more suicides,

say, among mathematicians than in other professions. Why

did I talk about it? Simply, it's because we speak better, despite

everything, from the backgrounds we know, we talk about it firsthand. And I do not have

talked about because, finally, there is a certain myth that wants things

be better off in the scientific community; who wants, for example, that

scientific activity is necessarily a source of satisfaction, a source of

pleasure, joy. While in a number of cases it can be shown

that it is precisely scientific activity that is a source of constraints,

repressions and tragedies. I know of other cases, let's say less extreme

than this one, in my personal practice. But it's to meet

of certain myths that I have spoken of such cases. Otherwise, I am completely

agree with your objection. So ultimately I believe there is a

misunderstanding, it's not really a significant difference in vision.

On the other question, I don't think science is the sole cause of the rather catastrophic situation in which we find ourselves find. I said from the beginning that it is one of the causes. Anyway, if this cause did not exist, the problems related to, say, the survival of man would not currently arise. They might land in a few centuries, but they would not arise at the present time. Good heard wars like the one in Viet-Nam could very well have place and have taken place without science having the current development. Which is striking, I believe, for a scientist, it is to note to what extent the the most modern techniques find their application in this war.

I went to North Viet-Nam and I was able to discuss on the spot with the interested in the various improvements to ball bombs, for example. The balls have a very fast rotating movement in order to better shred the flesh and also so that it can penetrate inside the anti-aircraft shelters which are dug everywhere along the streets and along the roads, if care has not been taken to close them. And finally, they burst in the air to better hit the civilian populations. Moreover, despite the instructions, most Vietnamese, as they have want to see what happens, do not close the holes. Thus, when the bombs explode, this makes these shelters almost illusory. Likewise, the metal balls have been replaced by plastic balls so that their detection by X-ray means is impossible. Must therefore develop new techniques to be able to extract these balls from shredded flesh. The military technology employed in Viet-Nam is oriented more towards a mutilation of the population than towards its direct extermination, because a mutilated person asks for care many other people to keep her alive, while one person

killed by asking for very little. So there are a number of fairly excruciating amounts of technology genuinely related to research, at the current state science.

Also, there's one thing I didn't realize at the time. where I started thinking about these issues is that practically all the great American commercial firms are directly involved in the manufacture of armaments. It's true to a lesser measure for French firms; I don't know what it is for them Swiss firms. When I left the institute where I worked because of the presence of 5% of the budget which was of military origin, I saw nothing take issue with the fact that most of the funds came from firms such as Esso, Saint-Gobain and others. But since then, I have discovered that these firms are also very directly involved in these productions arms, they all have important contracts with the army. Of such way that, ultimately, it becomes impossible to distinguish between research

- 37 -

military and research period, and even between, say, the firms commonly used and firms linked to the proliferation of military devices. Finally, I ended up realizing that everything was inextricably linked.

By the way, I realize that there is a question that I did not answer, which was possibly related to Galois. It was the affirmation that it was good to pursue scientific research for its own sake, for the pleasure of knowledge, in the same way as one pursues an artistic activity. So

there, there are perhaps one or two things to be said.

A first thing is that to come to understand and appreciate the kind of mathematics that I was doing, for example, three years ago,

even supposing that we short-circuit the usual channels in teaching, that we go directly to the fact, to the essential, we must expect something like five to ten years of specialized training.

However, it is clear that such training will be in the current state of things the prerogative of a tiny minority of the population. On the other hand hundreds of other mathematicians do equally esoteric things in their corner. In such a way that in the end, those who manage to understand gender thing I was doing, something I was intensely engaged in for a few years, are — what do I know — maybe five, ten fifteen, twenty people in the world, something like that. So,

the importance that can have from the artistic point of view, say, the activity mathematics is very different from the importance that can have, for example, music. To feel the music, we don't need of long training. In fact, we don't even need to be still born, because even an embryo, in its mother's womb, reacts already to musical stimuli. I think a lot of people must have done it. the experiment, in any case my wife made it. when there was a music jazz, when she was five or six months pregnant, the baby was dancing in her womb. Of course, when I talk about art here, I'm talking about art elementary, art that we can appreciate, and even that we can make each of us. music, drawing, pottery, things like that, which require relatively minimal training.

But it is true that in the arts, as in the sciences, as in practically any human activity, also in physical activity, in sports, the aspect of competition is becoming more and more important. Currently, for almost everyone, when we say art, the reflex is to think of people like Rubinstein, Gieseking or Heifetz, or like Picasso, etc That is to say, to immediately think of the great virtuosos of art, those who have reached a position of extraordinary prestige. Ultimately, art becomes the prerogative of a very small number of people who make art for

- 38-

us, by proxy, because there it is absolutely no longer a question of each of us does the same in his own life.

Now, this is still one of the things that could be said about the question of what is meant by a life worth living.

It is a life which, precisely, contains its share of creativity, including its part of artistic creativity. It is much more important that each of us to be able to be an artist in his own field and in his own level, to produce music, to perform it, say, on a harmonica, on a piano or a guitar and derive direct pleasure from it. This pleasure, I believe, will be infinitely deeper than the pleasure he may have in listen to a record by Heifetz or Gieseking. It is of another nature, in any case, it is placed on another level. Maybe one does not prevent the other, moreover, it is not clear. I feel like the kind of mentality which reigns among the great virtuosos — which makes them perform, for

example, five hours of scales a day, day after day — ends up killing much of the joy they feel in making music. And this is necessary to manage to hold on in the very strong competition which is practiced between virtuosos. I think it's pretty much the same type as the competition, sometimes unconscious, that there is between scientists. Competition that makes people I know, including myself sometimes, spend fifteen hours of their day, day after day, for a long time, trying to develop more and more mathematical theorems sophisticated, increasingly esoteric. I have the impression that this type of mentality will disappear in the generations to come.

Question •

— Don't you think there is something much more — what whatever the mode of civilization and which is proper to man• this freedom disturbing to ask questions, to ask "Why, for example, the planets revolve in this way around the sun? » ; "Why are we unhappy? ". This great freedom seems to me a little, too, be condemned with respect to science. Because, in fact, we also have this freedom to say that science is a misfortune. In making us aware that current science is bad, you you may in the future take away all the freedom of others. Maybe a day science might appear good. In a way, like a pendulum, the man is at the same time cohabited by the angel and the demon. You would simply like it to be inhabited by the angel. I will be happy, but human history has often shown, hasn't it, that it oscillates between the Wrong

and the good. You may be anticipating that the pendulum will go this time from the good side. I hope with you, but I don't know if this pendulum will be stopped in the future to this position.

- 39-

Answer •

— One of your questions is whether by turning our backs on science as it is currently done and, possibly, by taking away people's freedom to ask the kind of questions that current science asks, we is not going to remove at the same time the freedom or an appreciable part of freedom.

I would like to say in this regard that myself and my friends from Survive et Live in no way recommends taking coercive measures that prevent anyone from doing science. The question is not the. If I foresee that science, as it is practiced today, will wither away, that for example the whole of mathematics, to few things close, will disappear in the generations to come, it is that it will be of a quite natural decline because people will no longer feel encouraged to do so. So, to draw a parallel on a smaller scale, I believe it was in the first century AD, the science of sections hyperplanes, conic sections and bundles of conics was arrived at a degree of complexity such that the mathematicians of this time thought that it was the end of mathematics, because of all

way, by going further, things would become of such complexity that it would be impossible for the human mind to recognize itself in it. But it happened that, purely and simply, we have completely abandoned this kind of speculations and mathematics continued in ways entirely different and we can clearly see that mathematics has not ceased to produce something new until today. Along the same lines, I think that the direction of research that has developed over 400 years, say, in a certain spirit, will wither in the same way and that the human spirit take very different paths. Not in a coercive way, simply because it will no longer be practiced. There will be other requirements related to our real needs.

I think agriculture, animal husbandry, energy production decentralized, a certain kind of medicine very different from medicine that currently prevails, will be at the forefront. He is impossible to say what will be the share of purely creative joy in these new developments. I hope it will be a creative development where there will be no essential differences between conceptual activities and manual physical activities. When men become sufficiently in control of their needs so that an appreciable part of their creativity remains free — and this will take an unpredictable time, it will be maybe a generation, maybe ten, no one knows — at this time there, anyone, not just a certain scientific elite, will be in able to dedicate a significant portion of their time to research

purely creative, purely speculative, purely playful. Even though we take up certain directions of research that would have been abandoned in the meantime, for example certain directions of the current mathematics or even physics — if society is ready to support them, because current physics is not done simply by the head, it is done with serious instrumentation, with down payment, involves the mobilization of a collective energy important — at that point, I don't see any problem with it; but I think that it is absolutely impossible to foresee it now. Anyway, I agree with you that freedom is truly an essential criterion for the directions to take; well, for me it certainly is. I think that nothing new will be created apart from freedom and even, again, that the withering away of current science will increase our freedom, and it will not be at the expense of anyone's freedom.

about your angel and demon man image i don't believe in this dichotomy of good and evil. I do not share this view; he Rather, there is a complex mixture of two opposing principles. If you Allow me to make a little philosophical digression concerning the mode of mathematical thought and its influence on general thought. A thing had already struck me before coming to an overall review of the science for almost two years. it is the coarseness, let's say, of the mode of mathematical reasoning when confronted with phenomena of life, with natural phenomena. The models provided by the mathematics, including logic models, are a kind of bed of Procuse for reality. Something special about mathematics, is that each proposition, if we put aside the logical subtleties, e

st or

either true or false; there is no middle ground between the two, the dichotomy is complete. In fact, it absolutely does not correspond to the nature of things. In nature, in life, there are no proposals either absolutely true or absolutely false. There is even place often, in order to fully understand reality, to take into account seemingly contradictory aspects, in any case, aspects complementary, and both are important. From a point of view more elementary, no door is ever fully closed or fully open, it doesn't make sense. This dichotomy, which perhaps stems from the mathematics, of Aristotelian logic, really permeated the mode of thought, including in everyday life and in any debate of ideas or even of personal life. It's something that I often noticed when chatting with people, whether in private or in audience. In general, people see two extreme alternatives and do not see no middle ground between the two. If my interlocutor has chosen a certain alternative and that I have a vision that is beyond the one he

- 41-

considers good, immediately he will accuse me of having chosen the extreme opposite alternative, because he does not see the middle.

I believe that there is a vice of thought inherent in the way of thinking mathematics and I have the impression that it is also reflected in this Manichaeian view of human nature. On the one hand there is the good, on the other

apart from the bad and in the best of cases we see them living together. I have the impression that what we call bad is only a reaction natural to a certain number of repressions that we have suffered since our birth; in a sense they are just as natural reactions, as necessary as, for example, the onset of fever — a sign that our body is reacting painfully and positively to a microbial invasion. The task of the doctor is not to eliminate the fever, but to try to combat the microbial invasion with drugs.

This is at least the official thesis. Perhaps the physician's task of will the future be above all to understand the psychosomatic cause of microbial proliferation at this time rather than another, when there is always germs in the environment and while we are there exposed all the time. what are the real causes, what are the tensions to which we have been subjected and which make us vulnerable. But that's another story. So I have the impression that the Manichean vision is not very good. It belongs of the air we breathe with the ambient culture and I believe that this vision will change again.

Question •

"You think that this view of right and wrong is just air that we breathe and which comes from mathematics. I rather believe the opposite. Modern mathematics is younger than our whole philosophy medieval or even theology. Because this thought that there is the good God and the Devil, the two adversaries, it is very old. It is possible that medieval mathematicians of the fifteenth and sixteenth century were so

imbued with this idea that it was natural to think like that, about
of the other example, I think before medicine got to the point
current, we also tried to expel the evil spirits, the Devil. So,
it was the same idea. I just wanted to cast a doubt, I just see it at
upside down. I will not say that it is a vice that is due to mathematics
only, but I would say that she may have inherited that from the past.

Answer •

— Bourbaki is not at the origin of mathematics; in his notes
historical, Bourbaki traces it back to Greek mathematicians, let us say to
from Pythagoras. So it's already a very old tradition. Let's take

- 42 -

for example Euclid who developed this systematic mind in a
absolutely perfect, in such a way that it was taught until there is no
so much longer. It is therefore possible that mathematics is
for something in this state of mind; even if there is not — I cannot
I don't swear to it — a causal effect. Finally, the fact that the two things go
in the same sense, the mathematical dichotomy and Manichaeism or this
tendency to always see only the two extremes of an alternative, that does not
can hardly be chance; there is certainly a correlation between the two. This
are linked things in the dominant culture. This dominant culture,
anyway, does not date from yesterday, I think it has developed since
more than two thousand years. I'm not very good at history but, for
example people like Jacques Ellul or Lewis Mumford studied

precisely the ideological ins and outs of science and
the technology of

since the origins; as far as Mumford is concerned, I
seems that he already places them in the time of the pharaohs, the great works of
Egypt. So, I believe that our ancestors, on this subject, go back quite far.
But there was another question I believe?

Question •

— BEGINNING OF THE INAUDIBLE QUESTION of demystification or

denunciation of the role of science and above all the motivation of the
scientific, even if it is perhaps incomplete. I believe for example
that we could discuss for a long time and note the important roles that, in my opinion,
opinion, science in the very conservation of the social structures of our
society. I found the kind of interpretation that
could derive from your presentation on the solution which can be found at
this difficulty. The solution of withdrawing from, say, work which ultimately
is why the company pays you is a luxury solution that
can only be accessed by very few people and cannot be erected
in solution. Materially, a worker cannot withdraw from work
to develop his sensitivity, in my opinion, if a worker does not cultivate himself, this
is not because he doesn't feel like it, or doesn't understand what the
real problems; it is because the crushing weight of society and
rhythms of work, living conditions to which he is subjected do not
offer no other possibility, in my opinion it is not the symptoms that he

must be treated, it is the disease. The disease is entirely based in the social structure, in my opinion, it is only by participating in these structural changes that we could one day consider finding a new role either in the sensitivity of each, or a new role of the science itself. It is not by doing a bit of theory — here, on what is the role of science — that we can find our place. I believe the participation in this struggle is difficult for a scientist because precisely the fragmentation of social activities makes it difficult. I think

- 43 -

that participation in this struggle can only be done from one's position as work because the workstation is everyone's weapon and I don't see not why it would be any different for a scientist.

Answer •

"I think there is a misunderstanding in that you believe that I recommend this or that solution. However, indeed, I spoke about my personal experience, from my personal practice, by way of illustration of a type of action, of conclusions that can be drawn when confronted with some contradictions. However, it is absolutely not in intend to pose as a model for anyone. I realize that the conditions in which both are placed are extremely different. On the one hand, the so-called objective conditions and then the subjective conditions, say, the necessary state of readiness to make fairly drastic decisions; like the ones I have

taken on leaving the Institute in which I worked and a little later in deciding to stop scientific research. which does not prevent besides, that I am still paid to teach, last year and this this year, very esoteric science at the College de France and that the year next I will either be a teacher at the Faculty of Sciences or director of research at the National Center for Scientific Research (CNRS). That is to say that I will not have escaped the contradiction of my scientific state.

In the end, what counts for me is not so much reaching the position of moral purity which is perfectly impossible within this society — it's one of the many things I've learned over the course of of the last two years — , what matters is that we are a ferment of transformations, a factor of transformations where we find. Of course, if we find ourselves in a certain milieu professional, it is not necessarily necessary that we leave this workplace. But what I am convinced of is that this transformation will not occur through the magical virtue of adhering to a certain party or, from time to time, to distribute leaflets, or even to adhere to certain unions or to cast ballots. I am fully convinced that this kind of transformation will take place, to begin with, level of personal relationships. To the extent that these relationships personal will not change profoundly, nothing will change. If we believe that personal relationships can only change after the changing structures — that means bringing everything back to the light of day J of the revolution — the revolution will never come or the revolution that will come will not change anything. That is to say, she will put a management team

.44.

technocratic instead of another technocratic team and society

industry will go its way as before.

As an example of relationships that will need to change drastically, I think, for example, of the relationship between teachers and students. I would probably be faced with this situation this fall. It's here first time in my life, moreover, that I would be in an amphitheater with students to whom I should teach mathematics for good which will prepare them for certain exams, provide them with certain diplomas, which I am convinced are useless. On the one hand, they are not used to nothing for society as a whole and on the other hand, it is not even clear that they are of some use to those who will have this diploma, because it is absolutely not clear that this will allow them to have a trade by the after. Even today, most scientists either refuse to see the problem or, if they see it, lay a modest veil over it in their relationship with students. The relationship between students and they are therefore traditional teacher-student relationships; it is- that is to say that they do a technical course, the one that is asked of them, a point that's all. When, exceptionally, students ask questions techniques, we answer these technical questions as best we can and that's all. As for me, I decided not to stick to this type relationships and no longer separate mathematical education from a discussion cards on the table with students or anyone who wants

come and attend the discussion to try to take stock. "Why is what are we here?" ; "What are we going to learn whole ?" ; " Why ?" ; "What does the examination that is at the end of the program for this year? ; " What is its meaning ?" ; "What is our role mutual, me professor and you students? ". And finally, decide together what we will do. Undoubtedly, in the first years, unless the situation matures even faster than I expect, it is likely that the majority of students will insist that once these discussions over, we more or less follow the traditional program and that we do the ritual of using exams. It is also possible that they decide otherwise, in which case I will follow their advice. Anyway, there there is the possibility of a dynamic exchange, of a maturing of the general atmosphere.

In fact, I started putting these ideas into practice this very year. at the Collège de France where I had announced, as the first part during of mathematics planned, a discussion on the same theme as our discussion today. This proposal gave rise to a rather lively debate among my colleagues at the College de France. For the vast majority of them, it was an absolutely unthinkable thing that a course of mathematics can be partially and officially devoted to a

- 45-

question of this type. In fact, the title was longer. "Sciences et techniques in the current evolutionary crisis, are we going to continue the search scientific ? ". So I was asking the question of the crisis of civilization that

seems to be the urgent question to be debated at the moment. But maybe for the first time or one of the rare times that in this august institution we poses a truly burning question for civilization in which we are and that we propose to discuss it publicly and in depth, it's practically the only time the faculty meet refuses to give his approval to this subject of course. Indeed, the vote has gave something like thirty-five votes against and nine votes for and I was myself surprised to find nine colleagues to support my initiative. This surprise was, moreover, I am convinced, much more large among the other thirty-five. According to the tone in which this discussion, it was clear that, for them, it was unthinkable that a scientist in his common sense may not be shocked by the kind of proposal I was making for this so-called math class.

This, of course, just by way of example, not to say that everyone everyone can do the same thing, but as a concrete example of what, personally, I try to do to take advantage of a situation simply contradictory. Instead of trying to hide these contradictions, I try to make them burst as brutally as possible and this as a way to mature a certain situation.

Question •

— You constantly referred to scientific research, but I have the impression that you give the term too much meaning restraint. I have the impression that for you it is the mathematics well course, then physics, something like that, research

medical. But it seems to me that you don't know that there

looking in

social sciences, research in human sciences. You speak in

apocalyptic terms of what will happen to society, to civilization,

as if it was something that had to happen fatally and in a way

uncontrollable by man. I disagree with you because,

precisely, the human sciences make it possible to control this

evolution. We can already observe the concrete work of advertising agencies

not to mention things much more serious than consumption

some coca Cola. You speak in apocalyptic terms of things that must

happen like things uncontrollable for the man and there I believe that

you are wrong because if you want to change society in one way —

and I totally agree with you that it needs to be changed, even if I don't

I'm not quite sure if it's the same way, but in any case

we agree on the principle — on the contrary, I believe that we must do this

- 46-

cursed science, as the gentleman said, so that we too can

control this evolution that you present in the characteristics of

fatalism. On the other hand, when you say that you are going to discuss with the

students of what will be your relationship with them, you are going to do a science

of man which is called pedagogical communication. It's not

math, but it's science. I fear that fatally you

fall back either into religion or into science because either you

make apocalyptic prophecies or else you try to do with your

students, to reinvent sciences that have already been done.

Answer •

— You speak of an apocalyptic vision of civilization and that is a term that often comes up when we talk about civilization. It's always this same conditioning that makes us conceive that there is a civilization, as if there hadn't been hundreds of them and as if there weren't going to be any have hundreds more. So, already, a first point that I would like put back in place in my vision at least• it is that it is a certain civilization, which we can very well reject and which we can very well predict that it will disappear like many other civilizations disappeared. When nearly two years ago I contemplated the disappearance of the civilization, I was still too much a prisoner of its conditioning• I identified civilization, the only one I knew, with humanity. The destruction of this civilization actually appeared to me under a apocalyptic image of end of the human species. Well, half an hour ago or an hour, I explained that this vision has entirely changed now. The collapse of this civilization is not a vision apocalyptic; it is, let's say, something that seems to me highly desirable. I even consider that it is our great chance that he exists, say, a biological basis of human society that refuses to follow the way of the dominant industrial civilization. Finally, it's the crisis environment that will force us, whether we like it or not, to change our course and to develop lifestyles and modes of production that are radically different from those prevailing in civilization industrial.

On the other hand, you talk about the role of the human sciences, saying that there is
It's not just the so-called exact sciences, the physical sciences, and I know that very well.
You also know like me by the way, and that's a very serious criticism
what can be done to the human sciences, that they try more and more to
mold themselves on the model of the so-called exact sciences, the sciences
mathematics in particular. In such a way that, to the extent that the
human sciences want to achieve true scientific status —
since only science according to universally accepted standards is

- 47 -

considered serious — we lock up these human sciences more
moreover in an often mathematical jargon. We know the influence of
numerical tests, quantitative methods, in psychology by
example. One could also point out that quite a few treatises on economics,
large treatises, begin, for two-thirds of the book, with the exposition of
heavy mathematical formalisms whose sole purpose is to make them
incomprehensible to ordinary mortals. An economics professor from
Bordeaux said verbatim to a friend of mine that the purpose of this formalism
mathematics in a book of his composition was to hide the fact that the
genuine scientific content could be understood by any
person with the level of education of the Certificate of Studies. Thus, we can
make a very serious criticism of the human sciences in this direction.

On the other hand, the human sciences are subject to misappropriation and
As such, they are subject to the same criticisms as the other sciences. By

example, in the penultimate issue of *Survivre*, we give a lot of details of the use of anthropology in the South West War Asian. In fact, American anthropological science is largely part in the service of the military• to manage to square the populations natives in Southwest Asia, to study by computer the impact that might have this or that policy, like burning the crops for example, in order to know whether the spin-offs will be more beneficial vis-à-vis of the American establishment or if, on the contrary, resentment could prevail. So there are studies like these being done on the field by anthropologists.

Finally, I believe that there are not so many differences to be made point of view of the practical and ideological role between the human sciences and the so-called exact sciences, the natural sciences, let's say.

Question •

— I would like to ask you what are the aims of the movement *Survivre* and what contacts you have with the movements existing in the region such as the Bugey-Cobaye Committee.

Answer •

— The goals of the *Survivre* movement? At the beginning our vision was apocalyptic and we had made it our goal to fight for the survival of the human species threatened by the dangers of military conflicts and by the

ecological crisis resulting from pollution and the depletion of natural resources. But during a year and a half of existence, we have evolved a lot and I think that we could formulate the way which most of us see our purpose, to help prepare for the passage

- 48-

from one type of civilization to another through transformations that can take place immediately. So far, our work has been mainly critical work. Nevertheless, it has been a long time, more than six months, since we see quite clearly that it is necessary to manage to go beyond the critical work to get something done in a constructive direction. By example, disseminating information about the community movement, on the development of lightweight technology techniques, biotechnology, in the sense of the New Alchemists; disseminate from information on the experiences of new schools of the Summerhill type and things like that. But between the intention to do so and, say, the preparation from the point of view of experience, from the point of view of contact, etc. there is one more step. I think that this transformation, in the content of the newspaper and our action, will be done gradually, during the year or coming years. I hope that within a year, for example, at least half of the publications we will release, whether newspaper or otherwise thing, are going to be in that constructive direction instead of being purely reviews.

As regards our relations with the Bugey-Cobaye Committee, well we are on good terms with them! Five members of Survive have

participated in the big celebration-demonstration of Bugey-Cobaye in June latest. We are in fairly close contact with them. We even had someone on duty in front of the Bugey nuclear power plant during a month or two last fall. He was a member of the Hérault, a editor of Courpatier, a small regional ecological journal of the Provence.

From a practical point of view, one of the useful things we can do, let's say, as a specific action, especially because we are many scientists inside of Survive and that we are therefore better placed than many others, is to contribute to denouncing a number of science myths and let's start vigorously in this direction from the n°9 of Survivre. Its editorial is devoted to a critical description of scientistic ideology, with the title "The New Universal Church".

On the other hand, we believe that a very important phenomenon is taking place to happen. Namely the increasing number of isolated people in their corner or in their family or professional environment which are beginning to be aware of the existence of a real crisis of civilization. They therefore feel isolated and thereby paralyzed, and we want to help create a network of knowledge between these people. In fact, this network is being formed through all kinds of factors; I believe that, for example, the articles by Fournier in

Charlie-Hebdo contribute to it and I think that the existence of our group there also contributes. Moreover, this phenomenon of creating a network of links between initially isolated entities does not concern only the people but also groups. For example, for quite a while, the group Survive believed to be the only one of its kind to do an analysis criticism of science. But we have since realized that, a little everywhere,

there are similar groups springing up. We know particularly well the Lacitoc group and another group with United States Science for the People. There are other groups that have been created more or less simultaneously with us and under the same name Survival aux United States. These groups, which each started from a specific aspect of crisis of civilisation, gradually broaden their starting point with all sorts of other groups which sometimes started from very different points. I have the impression that this extremely fast process is probably going to be completed in the coming year. That is to say, from that moment, anyone in Western society, at least someone who begins to feel quite clearly that something is wrong from the point view of civilization, which is beginning to be gripped by a feeling inconsistency in his own life — but an inconsistency that has a global significance — from the outset it will be impossible for him to be isolated, he will immediately find a place in this network. It's a process to which a group like ours can very well contribute. Those are quite modest things, say, each does it in its own sphere of activities, but since there are many people and groups who do, the overall effect is by no means negligible.

EXTRA CONTENT:

- 50-

Article from the newspaper Le Monde of May 4, 1988

The French mathematician Alexandre Grothendieck declines the Crafoord Prize

The French mathematician Alexandre Grothendieck, who obtained in 1966 the Fields Medal, the equivalent of the Nobel Prize in mathematics, has just refused the Crafoord prize which the Royal Academy of Sciences of Sweden had decided to award him (Le Monde dated April 17-18). This prize, worth 270,000 dollars (1.54 million francs), which he was to share with one of these former students, the Belgian Pierre Deligne, awarded since 1982 to researchers working in the field mathematics, earth sciences, astronomy and biology. The French geophysicist Claude Allègre was the laureate in 1986. In the text which follows and which is addressed to the Permanent Secretary of the Royal Swedish Academy of Sciences, Mr. Alexandre Grothendieck explain the reasons for his refusal.

I appreciate the honor bestowed upon me by the Royal Academy of Sciences of Sweden in deciding to award the Crafoord prize for this year, together of a large sum, in common with Pierre Deligne (who was my pupil) and to myself. However, I regret to inform you that I do not do not wish to receive this award (or indeed any other), and this for the following reasons.

1. My teacher's salary, and even my retirement from the month next October, is more than enough for my needs

- 51-

materials and for those for whom I am responsible; so i have no need silver. As for the distinction given to some of my fundamental work, I am convinced that the only litmus test for the fruitfulness of ideas or of a new vision is that of time. Fertility is recognized by offspring, not by honours.

1. I also note that the high-level researchers to whom addresses a prestigious award such as the Crafoord award are all of a status social as they already have in abundance and the material well-being and prestige scientist, as well as all the powers and prerogatives that go with it. But is it not clear that the overabundance of some can only be expense of the necessities of others?
2. The works that have earned me the benevolent attention of the Academy royal date from twenty-five years ago, from a time when I was part of the scientific environment and where I essentially shared its spirit and its values. I left this milieu in 1970 and, without giving up my passion for scientific research, I internally distanced myself from more and more from the scientific community.

However, in the past two decades the ethics of the scientific profession (at least among mathematicians) has deteriorated to such a degree that pure and simple looting between

colleagues (and especially at the expense of those who are not in a position to be able to defend themselves) has become almost a general rule, and that it is in any case tolerated by all, including in cases the most flagrant and iniquitous.

Under these conditions, accepting to enter the game of prizes and rewards think would also be to endorse a spirit and an evolution, in the scientific world, which I recognize as profoundly unhealthy, and moreover condemned to disappear in the short term as long as they are suicidal spiritually, and even intellectually and materially.

It is this third reason which is for me, and by far, the most serious. Yes I mention it, it is in no way with the aim of criticizing the

s intentions to the Royal Academy in the administration of the funds entrusted to it. I do not no doubt that before the end of the century upheavals entirely unforeseen events will fundamentally transform the very notion that we have "science", its main objectives and the spirit in which scientific work is done. No doubt the Royal Academy will then part of the institutions and characters who will have a useful role in play in an unprecedented revival, after an end of civilization also unprecedented...

- 52-

I am sorry for the annoyance that may represent for yourself and for the Royal Academy my refusal of the Crafoord prize, when it would seem that some publicity has already been given to this allocation, without the prior assurance of the agreement of the designated winners. Yet I did not fail to do my best to make known in the scientific community, and especially among my old friends and students in the mathematical world, my dispositions vis-à-vis this environment and today's "official science".

This is a long reflection, Récoltes et Semailles, on my life as mathematician, on the creation (and more particularly the creation scientific) in general, which has become at the same time, unexpectedly, a table of manners" of the mathematical world between 1950 and today. A provisional printing (pending its publication in book form), made by the care of my university in two hundred copies, was distributed almost entirely among my mathematician colleagues, and more particularly among the algebraic geometers (who have done me the honor of remembering me). For your personal information, I allow myself to send you two introductory booklets, in a separate envelope.

Alexandre Grothendieck

Alexandre Grothendieck in 1988.

- 53-

Tribune published in the monthly CQFD n°128, January 2015.

Alexander Grothendieck: tribute to the deceased?

Many have discovered Alexandre Grothendieck on the occasion of the media, environmentalist and presidential tribute that has just been paid to him following his death on November 13, 2014 in Ariège.

France is proud of the disappearance of this "national genius" - omitting to mention that this one remained a long time, and deliberately, stateless. The "mathematical community" salutes one of its most eminent representatives — being careful not to mention the reasons for his withdrawal from the research in the early 1970s. This is because the situation has hardly changed and that it would be bad form to recall that our genius resigned with crash of his research institute because of military funding! No need for researchers to worry about the deep collusion between the scientific enterprise and the military and industrial powers. Better sow oblivion only small Grothendieck...

It is very tempting to draw a parallel between the celebration of this disappearance and analyzes of Robert Jaulin, a great friend of the mathematician. For this wicked savage among the anthropologists, the construction of the monumental Crazy Horse Memorial, celebrating the great Sioux leader, was intended to stifle the revival of the American Indian movement and came complete the ethnocide of the Indian peoples. And Jaulin to drive the point home in his friend's magazine in 1973:

“Western civilization being everywhere, and here first of all, destructive of civilizations, it is by construction a decivilization: it engenders a "cemetery society" a society of silence, however noisy. »

If it is not a civilization that disappears with Grothendieck, that we modestly qualifies as an "exceptional personality", it is quite a critical culture and one of the protest movements among the most subversives that need to be buried.

But after all, you will say to me, did not the cemetery press present Grothendieck as a pioneer of ecology? Oh, yes, for sure, ecology

- 54-

it's fashionable ! Yves Cochet, a symbol of electoral ecology and technocratic, even speaks about the deceased of "an ecology extremely radical fundamentalist" (Politis n°1328, 20-26 November 2014). But as to knowing what this radicality stems from, everyone avoids expand on what was the heart of Grothendieck's ecology: the critique of science and research as essential causes of the crisis ecological!

Rather than inviting people to re-read the texts or listen to the lectures that made Grothendieck the most famous representative of the salutary movement of self-criticism of science during the 1970s, we prefer individualize his commitment, dwelling on the hermitage in which he gradually withdrew or by opposing the associative ecology of Serge Moscovici, who died two days after him. Yet side by side Moscovici,

Grothendieck and Jaulin forged a critical analysis of the imperialist deployment of "modern" sciences, of their claim to universality, of their expropriation of the subject, of their colonization and destruction of the political sphere as of other civilizations, of their disqualification and relegation to the past and to the nature of savages, women or peasants... (cf. the collective work, *Why the mathematics*, ed. of the Threshold, 1974)

Serge Moscovici evoked as "first intellectual filiation" of the environmental movement criticism of science carried by scientists like Grothendieck. Far from the decrease in research advocated by this last, of his critique of expertise and his denunciation of the myth of a

citizen regulation of technosciences, the tributes that surround its death are sadly representative of what ecology wants to retain from his origins.

Celine Pessis coordinated the work survive and live, criticism of science, birth of ecology, ed. The Escape, 2014.

- 55-

Summary

Introduction & Biography 1 How I became an activist 5

Article from the journal Survivre et Vivre n°6, January 1971

are we going to continue

the scientific research ? 10

Transcription of the conference-debate given at CERN's amphitheater on 27 January 1972

The French mathematician

Alexandre Grothendieck

declines Crafoord 51 award

Article from the newspaper Le Monde of May 4, 1988. Celine Pessis

Alexander Grothendieck:

tribute to the deceased? 54

Tribune in the monthly CQFD n°1 28, January 201 5.

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56-

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Edited by

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Notes & Selected Pieces

Bulletin critical of science, technology and industrial society

Eleven issues published by La Lenteur editions 127, rue Amelot - 75011 Paris.

I would like to specify the reason why at the beginning I interrupted my research activity: it was because I realized that there were such urgent problems to be solved about the crisis of survival it seemed crazy to me to waste energy doing pure scientific research.

When I made this decision, I was thinking of devoting several years doing research, acquiring certain basic knowledge in biology, with the idea of applying and to develop mathematical techniques, methods mathematics to deal with problems in biology.

It's an absolutely fascinating thing to me and, nevertheless, from the moment when some friends and I have started a group called Survive, to precisely take care of the questions of survival, from this moment, overnight, interest in scientific research disinterested completely faded away for me and I didn't ever have a minute of regret since.

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Regarding the first motivation, I can say that it was my main motivation during my life as a researcher. Indeed, scientific research gave me great pleasure and I didn't question it much further. In fact, if it gave me pleasure, it was largely because social consensus told me that it was a noble and worthwhile activity, without really explaining why it was positive, noble, etc. Of course, direct experience told me that, with my colleagues, we were building something, a certain structure. There was a sense of progress that gave a certain feeling of achievement... of fulfillment, one could say, and at the same time, a certain fascination in the problems that arose.

But all this, ultimately, does not answer the question: "what is the social purpose of scientific research?" Because if its only purpose was to provide pleasure, let's say, to a handful of mathematicians or other scientists, society would undoubtedly hesitate to invest significant funds in it - in mathematics, they are not very significant; but in other sciences, they can be. Society would also undoubtedly hesitate to pay tribute to this type of activity, while remaining relatively silent on activities that may require just as much effort, but of a different kind, such as playing marbles or similar things. One can develop to an extreme certain abilities, certain technical faculties, whether intellectual, manual or other, but why is there this valorization of scientific research? It's a question worth asking.

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