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BILL MOYERS' JOURNAL

René Dubos: The Despairing Optimist at 80

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René Dubos: The Despairing Optimist at 80

[Tease]

RENE DUBOS: I think one of the distinctions of being human — and I use that word again as a kind of faith that being human is something very special. It is a condition whereby you know that you are an animal creation called *Homo sapiens*, that you are capable of transcending it by doing something above and beyond the biological necessity.

BILL MOYERS [voice-over]: Tonight a conversation with René Dubos at 80. I'm Bill Moyers.

[Bill Moyers' Journal opening]

MOYERS [voice-over]: An 80th birthday testimonial to René Dubos, one of the world's renowned scientists — a microbiologist, ecologist, and author, who has devoted his years to the care of human life, to the life of the mind, and to the well-being of Earth itself. René Dubos is Professor Emeritus at the Rockefeller University in New York City, where he has studied and worked since 1927. He was only 38 when he won world-wide acclaim for the discovery of gramicidin, the first commercially produced antibiotic. One of his most personal and significant scientific journeys began when his first wife died of tuberculosis in 1942. He turned his energies toward explaining and treating what was then a terrifying and incurable disease, and his work led to the perfection of the TB vaccine commonly used today. Then he began to explore the relationship between the environment and disease, and over the years the search for understanding the effect on human life of environmental forces has become his grand obsession. One of his two dozen books, *So Human An Animal*, won the Pulitzer Prize, and he continues writing today about environmental quality and the future of technological societies. Recently, Dr. Dubos returned to his native France, where he was born on February 20, 1901. He visited the small village where he lived, and reflected on the role that this part of the world played in his life.

DUBOS: Well, when I returned to Henonville after 50 years of absence, my greatest surprise was that so little had changed in the visual appearance of the village itself — of the houses, of the church, of the school house — I felt right at home immediately. Living in a small town — in a small village, I should say — made me acquainted with all sorts of different kinds of people doing all sorts of different kinds of things. By the age of seven or eight, I had seen with my own eyes people engaged in a very great diversity of occupations, and moreover, I had learned to experience directly with all of my senses also the things that happened in the world. So this little village was a microcosm of the world.

MOYERS [voice-over continues]: At a stop by his old school house, he reminisced with a friend about the influence of some books he read as a boy.

DUBOS: Some of the books that were most widely read were those stories of Jules Verne — we read them all. I don't know whether that was important in teaching us about science, but it certainly made a few of us eager to learn more about science. As I look at those books now at the end of a long life devoted to science, I have come to realize that their importance was to make us aware that all of science comes out of dreams. One first has to dream about the desire to go into space before one invents ways of going into space. So I think of those science fiction books as the source of inspiration for all the great advances that have been made in our times.

MOYERS: Today René Dubos lives in New York with his wife Jean, a former laboratory assistant. They are developing the René Dubos Center for Human Environments, created to communicate Dubos' ideas to other communities around the world. The center is located at Wave Hill, on the Hudson River, where President Theodore Roosevelt conceived his policies of national conservation. We began by discussing an idea heard often in the last five years — inventing the future.

DUBOS: I call it anticipating the future, because by anticipation I mean that we have enough knowledge to anticipate the likely consequences of whatever we do today. We can anticipate the likely consequences of changing the physical environment, of changing the social environment, and because we can anticipate them, we really are responsible for the future. Perhaps this is an occasion where I can speak about the one problem which is causing me

the greatest anguish at the present time, namely, unemployment of young people — not only of young people, but especially of young people. Now, I believe that no human being can live without being part of a fairly well structured social system. I believe that we all become social organisms by functioning, not through our physical characteristics as *Homo sapiens*, but through the socialization which makes us utilize our biological characteristic to behave in a certain kind of way.

MOYERS: To participate with others.

DUBOS: To participate. That's why there are so many different societies, so many different kinds of civilization, because we participate in so many different societies.

MOYERS: And work is a crucial—

DUBOS: And work in it, and have a significant role in it, whatever that role be, have a significant role in it. Well now, when I see a society like ours — it's worst in the United States, but it's beginning to spread over Europe — accept that young people, a very large percentage of them, be not given a chance to function in that society, and accept as a solution that to give them money so that they can be fed, they can be entertained, and then let them out of society, I think by— it's inescapable, that those young people will create a parallel society which unquestionably in the not-too-distant future, and even now, will become a threat to our society.

MOYERS: Well, we see that every day in New York City, where there are half a million to 800,000 young men between the ages of 15 and 25 who have no jobs, who have no social role, and they have created this parallel culture which is now spinning over, infiltrating, penetrating, assaulting, the other culture.

DUBOS: And we see the insult to humankind, that I see in all this, is that we believe that by a welfare policy — which consists in giving money so that they can eat, that they can be entertained, they can do what they want — that this is solving the problem.

MOYERS: Are you saying that we can invent a future, anticipate a future, and bring into reality a future, which gives work and social participation to people like that?

DUBOS: Obviously, I would not know how to do it, because I have no experience in socioeconomic organization.

MOYERS: But you take a religious view of it, that it can be done?

DUBOS: I take a religious view of it, I—

MOYERS: As a moral obligation to do it?

DUBOS: But it can be done, and I would go very far, that all of human history is made of situations where people — a few people — have anticipated the problems of the future, have engaged themselves into the problem, and have made something out of it.

MOYERS: That leads me into an area that you know a great deal about, and that is science, in general. Let's take a very specific case that has been in the news recently. It was reported not long ago that three Swiss scientists had literally manufactured, or cloned, a mammal — for the very first time, three manufactured, made by hand, mice, in which the nuclei were taken from mouse cells and fertilized into mouse eggs. And the cloning of those mice led the conservative writer George Will to say, "What will science try next?"

DUBOS: Well, many people have assumed, and that's what George Will is asking, is it not possible that we are going to try to change human nature — you know, manipulate human nature. Well, we are very far from being able to do that, I have even some questions that it can be done. But the fact is, that today in this country alone, there are six institutes composed of philosophers, theologians, legal people, scientists, physicians, who are trying to think what kind of policies, what kind of legal structures, what kind of constraints, must be introduced if we are going to engage into that kind of thing.

MOYERS: What is your own opinion about the question of social policy that this raises? And the question is, should science be free to try whatever it can imagine, or aren't the implications of modern science so momentous that science cannot be completely free from social regulation?

DUBOS: I'm afraid you are asking the wrong person. I have been a scientific investigator up to the age of 70, and in my opinion, science must be absolutely free of doing it, and moreover, if you were to try to stop it, you could not stop it, because human beings for 35,000 years have been trying to do that all the time — to change, to understand nature, to have a picture of it, to modify it this way or that way — and if you were to try to stop it by law, so that you could not do it in a laboratory, I would do it in my kitchen.

MOYERS: Why?

DUBOS: Because I think, if it is anything to be human, if we are — if we do believe that we are different, as I do, from the rest of the animal kingdom, it's because we aspire at the complete understanding of reality, of the cosmos. I say we aspire, even without hope of reaching it, and probably there are limits to what we can reach, but certainly it's not worth being human if you do not try to do it.

MOYERS: The problem is that as you aspire, and as scientists make all these discoveries, there are unintended consequences: napalm, which was a kind of soap that's used to thicken gasoline, was used to burn children as well as soldiers in Vietnam; nuclear energy, which has such wonderful potential for alleviating many of our problems, has been used for destructive purposes.

DUBOS: But that all began with fire. After all fire is a very dangerous thing, but the fact is that 500,000 years ago human beings learned to make fire and to use it, and there have been lots of bad consequences, but I suspect you or I would not be here in this room if we did not use fire. So, that brings me back to a word that I have used a little while before, namely the word *anticipation*. So far, and when I say *so far*, up to about 25 years ago, we were satisfied with acquiring knowledge, increasing knowledge, with the confidence that eventually it would be helpful, useful. Now we have all those examples of which you have mentioned a few, where disasters have happened, and I'm sure that more disasters will happen, but somehow or another, during the past 20 years, we have begun to cultivate the science and the art of anticipating all the consequences — not all, but many of the consequences — of what we do and use. And I think, as we cultivate this art, I think along with it we cultivate a sense of responsibility, if we are really human beings.

MOYERS: All right, let's the consequences of biological research. Where do you think it will lead us?

DUBOS: Well, first — let me say I happen to believe — and there is no very good reason but sufficient — that one can live to the age of 120. I think the normal life span of a human being is about 120 years — I have known a few people over 100. And so I suspect we eventually will get there without too much difficulty. However, I don't find that of special interest. What I find of much greater interest is the conviction, my conviction — more than a conviction, it's a fact — that within our brain there are potentialities for visualizing, creating, and enjoying much more than we visualize, create, or enjoy. Crudely said, it is stated that at any given time only a very small percentage of our mental equipment is at work. Well, I would see the possibility that in the not-too-distant future we'll learn so much more about our brain that we will become much more human, because it is our brain that makes us really human. See, I don't think we are human by being a biological member of the biological species *Homo sapiens*; we are human because we belong to a human society. And that's — the potentialities of that are obvious for anyone who knows even the slightest amount of history. Look at the immense diversity of civilizations in the past 5,000 years. Well, I'd have no question that we can create much richer civilizations in the future.

MOYERS: You talk about, we must be in a human society to be human. And yet, as people are getting older — you talk about possibly living to 120 — was there ever a time when you didn't think you'd make it to 80?

DUBOS: Yes, because I have been a very sick man all my life. Whether one makes it at 80 or later, depends as much upon what happens up there as what happens in your physical organs. As apparently you know, at the age of seven or eight I had very serious rheumatic fever, developed a heart lesion which is still very active, and could have submitted and do what most people do, and take a very slow life, taking care of my heart, so to speak. Whereas I began — I decided, consciously, to function and to re-educate myself to take advantage of what I call the phenomenal resiliency of not only of human systems, but of all natural systems — and by the way, that has a lot of do with my views about environmental problems and ecology. So that by the age of 79, last year, I was physically the strongest that I have ever been.

MOYERS: Well, what did you say to yourself when you were ten years old, when you had your rheumatic fever and were confined to your bed, what did you say to yourself?

DUBOS: At that time, nothing that I know. The only thing that I remember is that I did— I was seven or eight, so I probably didn't say anything physical, suffered physically; but as I came from a very humble family — my father was a small butcher whom I hardly ever saw because he died during the first World War — I ran the butcher shop with my mother and in the evening in that little village I used to help her do the dishes and my mother, who had left school at the age of 12 but was an immensely perceptive person, would talk to me about what I should do with my life. And as I recall there was only one significant book in the whole in that little village, that the dictionary — I don't know whether you know what that means — I don't mean what "dictionary" means, but in French, *le dictionnaire Larousse*, it's a little dictionary that everybody, that many people had in their homes, and at the end of that dictionary there was a special section for the, what was called *les grands écoles*, the high grade schools of France, and my mother looked through all that and had me daydreaming about *les grands écoles* and whether I could eventually get there, and she obviously had decided that I would get to one of them. And throughout my life, this evening with my mother pointing out to me that there were those great schools and that out of them came a kind of life different from the one we were living, this has been the central, perhaps the most important fact in my life. I eventually did go to one of them.

MOYERS: This was a conscious, deliberate, exercise of your will?

DUBOS: Yes, I really at that time, I suspect with the help of my mother, who somehow or another from the beginning had great aspirations for me, why I don't know, and that I did decide that.

MOYERS: Is this what you meant a minute ago when you said that the mind has as much to do with health as the biological organism of the body, that you can choose health, is it that simply said?

DUBOS: Well, you know, it's not that simple, it's very complicated, but I believe it's the most important aspect of medicine. And everybody tells you, why it is so, that the purely mechanistic view of biology and of medicine in particular, comes from Descartes. I wouldn't pretend that I'm a great reader of philosophy, in fact I don't read philosophy very much, but it happens that among the virtues of France and even though I have lived in this country for so long, I still believe that there are special kinds of virtue in France, there are books being published which, they are very simple books, about all the famous people of the world, most of them being French—

MOYERS: Some chauvinism, there.

DUBOS: Well, you figure, a justified kind of chauvinism, because it's a kind, means that it's a chauvinism where you can really understand, because it's somebody who speaks your language. Well there is one about, it's called, *Descartes, par Lui-Même — Descartes, by Himself* — just as you would have *Schopenhauer by Himself*, just selecting fragments of Schopenhauer, of Emerson, or in this case of Descartes. So not so long ago I was reading the *Descartes par Lui-Même*. Whereas Descartes is depicted, and rightly so, as the person who separated so clearly in his mind and in the mind of the modern world, the thinking process from the biological process. There's a letter by him to a princess, a German princess, perhaps you knew he wrote a great deal of letters, he had a great correspondence all over Europe, in which he tells her about how in fact the most important thing about health is to be happy. "When I'm happy I'm never sick. I become sick only when I'm unhappy." But perhaps you know that he died in Sweden because he was so unhappy with the way Queen Christina of Sweden handled him, so to speak. So that, even in the case of Descartes, the awareness which is that of practically every human being, that what happens up in our brain is crucial to what happens in our body and vice versa. Now, I think any sensible person knows that, but during the late 19th century as scientists we have not known how to deal with that, so we deal with all the physical-chemical aspects of our body, and we do wonderful things with it, but now during the past few years, and I say few years, five or six years, one has recognized the existence in the brain of that new kind of hormones which are called endorphins or other such names, which to a large extent condition how we respond to things, whether we experience pain, whether we behave in a way or another, and my prediction, if I can afford to make one at this late stage of my life, is that the great advances in medicine during the next 20-25 years will be how the states of mind determine to a large extent how we respond to our, the limitations of our body. In the 1940s I was a very successful scientist. I was president of all sorts of things, president of the Harvard Society, president of the American

Microbiological Society, president of other societies, and I devoted myself to these duties with as much energy as I could, and at that time I developed a massive gastric ulcer, bled myself to death almost, and that time while being in the hospital, I read a bit of Chinese philosophy so that you had to learn to live in a more reasonable way and I have acquired, to a limited extent, some form of control myself—over myself, not too much, and I am sure that that has helped me to live to the age of 80 despite of all my ailments. Now when I developed my heart insufficiency, rheumatic aortic heart disease, I decided, and I don't know when I did decide, that I would start, continue functioning. I walk a great deal, wherever I go I walk, even to this day I walk miles, several miles every day. And I have somehow or another compensated for my aortic deficiency, so that as you see me, I function fairly well. Now I have transferred this kind of conviction about the *resiliency of human nature* to the *resiliency of external nature*. And if you were to take the time to look at my last book, which is called *The Wooing of Earth*, it clearly is an attempt to illustrate through many examples that wherever great damage has been done to the earth, if we give the earth the occasion, if we give to nature the occasion to function again with its forces of recuperation, then things come back. I have seen it in Greece, where those desert lands have come back into forested land as they were before Plato's time, provided you prevent people from cutting trees, provided you prevent goats from browsing and destroying new growth. But I have seen it everywhere. I have seen it in France, in Verdun where perhaps you recall the worst destructive battle of modern times were fought, where the forest was completely destroyed, and where now it has completely come back, 80, what is it, almost 70-80 years later.

MOYERS: Verdun?

DUBOS: Verdun, completely come back. But I have seen it everywhere. Now if you take this view, then you approach problems of the environment with a much more optimistic attitude, because you know that your role as human being is not to reconstruct things, but to introduce enough intelligent attitude so as to help nature come back. And the world is full of such examples of restoration.

MOYERS: And you think this applies as well to the human being, that we have powers within us of self-recovery if we learn how to nurture.

DUBOS: Not only do I believe that applies to human being, I believe it's the most important aspect of human life.

MOYERS: How do we learn to do this? Because now it seems like we are self abusive, it seems like we have created an environment which sucks out of us that self-renewal energy—

DUBOS: You know, how do we learn to use it, I am afraid I am going to use a word that I shouldn't use in front of you, through faith. And when I use the word faith, I am not using it as applying to a specific religion. Faith in life. The book on which I am working now is called *Celebrations of Life*. That's what the title of the book is. I believe that in all its phases, in all its aspects, there is in life something that is very unique, something very different from the rest of inanimate creation—the power of restoring itself. The difference between shoes and the sole of your feet is that if you walk for a long time the sole of your shoes wear out and you have to discard your shoes. If you walk barefooted, the skin of your feet grows back, renews itself. Your feet are living, the shoe is dead. And somewhere or another, there is something very profound there—the power of renewal. I have—this is very deep in me, it's a kind of faith, call it will you just faith, if you will.

MOYERS: It's a paradox, coming from a man who has spent so much of his life examining quantifiable and measurable phenomenon, to hear him discuss aspects that are indefinable about life.

DUBOS: Yes, well, many people tell me and I know it is true, that if you read, if you were to read my earlier writing until about 1965, there is in them—not a pessimistic note, but a sense that things are really going wrong, that for all we know the world and human life is going to be destroyed; whereas if you begin to—if you read the books I have written since 1970, increasingly there is an optimistic note.

MOYERS: Yes, yes, and that—

DUBOS: How did that happen? Well, I wasn't conscious of it, but I can only answer the one reason which is, of which I know all the facts, even though I may be rationalizing. Until the age of 19—until the year 1965 I was a laboratory worker. I spent all my time in the laboratory with system where I could control everything, where everything that happened was determined by the world I had created, the world of experiment, the experiment, the

experimental setup. Then around 1965, or perhaps a little before, I began through a chain of accidents, to move into the human world. For example, I became involved in trying to save Jamaica Bay in New York City, and what I did discover at that time is that all over this country, and I now know, over much of the world, there are countless people who are willing to do things. The amount of good will in the world is very much greater than anything we expect. About Jamaica Bay, I have not yet written that, but I'll give that specific example. Jamaica Bay was used, as perhaps you know, a place where to dump the garbage of New York City and where 1600 sewer lines were pouring the sewage of New York City into the bay every day. There was one man — a very unimportant man, unimportant officially, immensely important in history — his name was Herbert Johnson. His job was to supervise the dumping of the garbage into Jamaica Bay, that was brought by hundreds of trucks every day. Now this man — I've learned a great deal about him — happened to have been the son of a gardener; oddly enough he was the son of a gardener who worked on Mr. Rockefeller's estate in Pocantico Hills — I have discovered that very thing — so that he knew a great deal about plants. He began planting shrubs and trees and grasses over those islands of garbage, because he knew enough how to do that and because he felt like doing it. Then, trees grew, shrubs grew, grasses grew, birds came back, eventually the city took notice of it, then began to stop pouring sewage into the bay and, to make a long story short, at the present time Jamaica Bay has come back essentially to be one of the most beautiful bays of the New York area, to such an extent that it's being used for education in problems of nature, and that it is the richest bird sanctuary on the Atlantic coast.

MOYERS: And this experience, it triggered your optimism?

DUBOS: This is where it began. And then ever since I have been all over the United States. I'm not overstating, practically every state; and everywhere I have found a Mr. Herbert Johnson or a Mrs., a little lady. Not all of them as good, but all of them doing something, and there are hundreds of worthwhile such people.

MOYERS: Well, you make me want to take heart, but over the weekend, I read the *Global 2000 Report to the President*, a document prepared at the end of President Carter's administration by more than a dozen federal agencies, whose purpose was to make projections — not predictions, but projections — about what would happen between now and the year 2000, if present trends continue. And I must say, despite your optimism and hopefulness and your faith, as you call it, reading this document makes me almost as despairing as possible. This document really makes me wonder about what the earth is going to be like in the year 2000.

DUBOS: I think it is an essentially false document. False, because it is based on erroneous information — all of it erroneous. And if you were to read the copy that you have in hand now, you would see that they themselves state, "Mr. President, we have discovered that there is not a single agency within the United States that can provide useful, reliable information about problems of the world." That information that is using there is most of it so bad that it justifies the expression, "garbage in, garbage out," which people who use computers to derive conclusion have invented; they know that you cannot really derive any valid conclusion unless you have very good data. And there is no good data. For example—

MOYERS: Let me just interrupt you and say, what about the conclusions in here that by the year 2000 a third of the world's population will be malnourished? What about the conclusion that every year in Asia and Africa an area the size of Maine becomes a barren wasteland? What about the statistic that every year the United States loses a million acres of prime farmland; that people all over the globe are becoming ecological refugees, leaving the countryside of Haiti, for example, that cannot sustain them any longer, and moving into the cities, and in fact coming to the United States? The chief conclusion of this document is that human and economic pressures on renewable resources in some areas of the world are becoming so great that the capacity of the earth for self-renewal, as you call it, self-recovery, as you call it, can no longer be taken for granted.

DUBOS: Well you know it would take me ten hours to answer your questions, so I'll just pick up a few points. Number one, one of the facts that they state, and which is all right, is that there is a great deal of deforestation going on in the land. But they don't mention that the largest program of reforestation ever undertaken by humankind began about 30 years ago. That all the plains, all the hills of China have been completely deforested for the past 2000 years and anybody that has been on continental China knows that— can give you the figure that something like a hundred million acres of land is being reforested in China; I have read a very poetical description of people, very learned people, who said as they flew, as they fly over China at the present time, what to see all those young trees growing

everywhere. But the great enterprise, one of the great enterprises of the continental China is reforestation. They don't mention that in North Africa, the program of reforestation is absolutely extraordinary; they don't mention that in Ethiopia, even in the Sahel, there is reforestation is going on on a very great scale.

MOYERS: And yet I've been in Africa, Dr. Dubos, and in areas of Africa where firewood is now the chief means of energy, and there's so little of it that a single member of the family has to spend 360 days a year, gathering firewood. How do you explain these contradictions?

DUBOS: Explaining these contradictions is fairly easy. It's that the problem has been recognized only during the past few years, and it's only now that people begin to do something about it. If you look through this excellent, otherwise excellent, piece, you will find that everywhere, in each paragraph, they say, "If present trends continue."

MOYERS: And you don't think present trends will continue?

DUBOS: Present trends never continue. Human beings, and perhaps this is where I express my greatest faith: if there is something about human beings is that they never stand idle in front of a situation that threatens them, provided they can see the consequences of it. They start doing something about it.

MOYERS: Yet you yourself once asked, "What will become of the glorious sensual experience of living on this planet, if there are five times as many people on it as there are now?" And this report says that by the year 2000, we may have six billion people instead of the present four.

DUBOS: Yes, which by the way, I believe, I believe because there is nothing we can do about it—

MOYERS: Most of the growth in population, is it not, will come in those poorer areas of the world where it will be very difficult for them to feed, clothe, and house themselves?

DUBOS: No—

MOYERS: You don't think so?

DUBOS: Well it—no, by the way, I believe there will be problems in Southeast Asia, in Central America, but not in the rest of Latin America, which is essentially empty, as you certainly know, the population density in Latin America is very much lower than what it is here, and population on this continent is very very much lower than what it is in Europe. But I'm afraid there will be disasters in Southeast Asia, some part of Southeast Asia, and in Central America, and probably in other places. But the rapidity, as one has discovered, with which people change their patterns of family size can be truly extraordinary. Perhaps you know that for ten years or more I wrote a column in *The American Scholar* under the title, "The Despairing Optimist." And the structure of that column was this: I always began by stating a problem which appeared so tragic, so disastrous, that the end of the world was in sight. Then I asked myself, is there something that can be done about it — that was the second part of my column. Then the third part was to look around the world and say, yes there is somebody doing something about it. And I believe that to a large extent this is our situation. We are for the first time in history capable of visualizing the consequences — of anticipating the consequences of what is happening, and many people do something about it.

MOYERS: But is there time for the word to get around, so that human beings can change their behavior in response to their anticipation?

DUBOS: Yes, well I often asked myself that question, and this is really oversimplifying the question, that it takes about 10-15 years to change patterns of behavior. So your legitimate question — and it is a very legitimate one — can one wait 10-15 years before a disaster happens, and there it takes a kind of faith.

MOYERS: So the optimist is not despairing?

DUBOS: No, I think one of the distinctions of being human, and use again that word of a kind of faith, that being human is something very special. It's a condition whereby you know that you are an animal creature called *Homo sapiens*, but you are capable of transcending it by doing something above and beyond the biological necessity. Last night I was in the process of completing a book that I am in the process of writing, and I was working on the chapter of priorities — what are the important things in our civilization? And then I asked myself, well, why am I struggling with all this, why am I doing it? And then there came to my mind a phrase in Leonardo da Vinci's notes. *Leonardo*.

per che tanto pene? — "Leonardo, why do you give yourself so much trouble?" And I think he and I are giving ourselves so much trouble because being human is being something that goes beyond the physical satisfaction of our body, of *Homo sapiens*. All of a sudden, there came to my mind a lecture that I gave some two or three years ago in New York City, about environmental problems, and in which I describe that one of the Christian saints, Saint Bernard, who created the Cistercian order of monks, took some twenty of his followers to a valley in the east of France, a valley which was very unpleasant from all points of view — brushes, and insects, and malaria, and whatever you want — and then eventually transformed it into something which is one of the most enchanting parts of France, namely, Burgundy. And Saint Bernard said, "It is the role of the monks to complete the act of creation." In fact, Jewish thinkers had been saying that long before, and they have a wonderful phrase for it, a phrase that you can find throughout the rabbinical writings; and the phrase is, "Man as the co-partner of God." "Man as the co-partner of God." Now I don't want to present this as a kind of religious indoctrination, as a kind of religious preaching, but rather as a kind of feeling, very deep in me, that in some way to be human means that we on earth have to do something to be — to make the earth a better place, a better place not only for us, but even a better place for all the rest of creation on earth.

MOYERS: But against your faith and optimism must be placed the fact that more and more people are moving into urban areas, crowded, dirty, plagued with complex problems, and that as you talk about the natural order, and of nature, the fact of the twentieth century is urbanization, cities.

DUBOS: Yes, well, obviously we could have a whole, and many sessions on cities, and so instead of answering your question, let me describe a fact. Most of my life in Manhattan was lived between 66th Street and 69th Street on the east side. Now what I have seen during the past few years is that every year on 66th Street and on 69th Street, the streets are closed to automobile traffic, people organize some kind of celebration, some kind of festivity — festivities that are not unlike the ones I knew when I lived in a small village in France of 450 people. And when I see the amount of good will, the amount of *joie de vivre*, the amount of extraordinary feeling, of intensity of living that can go on even in the cities, then I believe that even the cities eventually will learn that urbanization can be converted into something which it was supposed to be in the beginning; urbanization means creating an environment in which human beings can express as much of their potential abilities as possible, and moreover, can enrich their potentialities by reacting with each other.

MOYERS: So when you use the term, "the glorious, sensuous experience of life on this earth," you mean not just in a state of wilderness, but in a state of society as well.

DUBOS: Perhaps this is the only profound justification I have for being involved in the activities of the institutions in which we are functioning now — which my friends have been — have had the kindness of calling the René Dubos Center for Human Environments — which is that we are not only concerned with pollution, with problems of natural resources, with problems of making the world richer, but in some way or another, with making the environment — the natural environment — more compatible with human beings, and if my dreams come right, in creating a kind of symbiosis between the natural environment and human being. And I am using here the word symbiosis in the very strong sense that it had a century ago, when it was invented by a German scholar; symbiosis meaning that things live together, they transform each other, and they transform each other by contributing something, both to both components of the system, so that I would say the ideal of the René Dubos Center for Human Environment is to create something which makes the physical environment better, which makes nature better, and which makes human beings better, and that the two, the two together be so well united that they come to create a unity, which would be eventually the unity of life.

MOYERS: This has been a conversation with René Dubos. I'm Bill Moyers.