



Nobel Voices Video History Project, 2000-2001

Interviewee: Christian de Duve

Interviewer: Neil Hollander

Date: June 28, 2000

Repository: Archives Center, National Museum of American History

HOLLANDER:

Doctor, if you would please introduce yourself.

DE DUVE:

Well, my name is Christian de Duve. I was born in England, but I'm a Belgian national. I have worked a lot in Belgium and a lot in the United States, because I had two appointments, one in New York and one in Brussels for a long time.

I studied medicine to start with. It was a difficult decision, because I wasn't interested in science when I was at school. Chemistry, physics, biology, I found extremely boring, mostly because they were taught very badly. And so I was more interested in literature, Greek, Latin, philosophy, mathematics, and so on. So what I was going to study was quite a problem.

I should have gone into the humanities, essentially, but I wasn't too interested in the possible careers that were opened by that kind of study, so I compromised. Medicine, because I thought that as a career, there could be no more beautiful, fascinating, exciting job than to be a medical doctor, to be a physician, to work with patients, do good. So just to be able to become a doctor, I thought it was worth the sacrifice to study three years of chemistry and physics and biology and things of that kind.

So I discovered science when I was at university, very early, because as a young medical student, I spent my free time working in a research laboratory. And then suddenly, it was a revelation. I discovered science. I discovered the interest of living processes, and so I was hooked. And so I finished my medical studies, but never practiced medicine. Instead, I went back to school to study chemistry so that I could combine chemical knowledge and biological knowledge, and I became a biochemist.

I went abroad. That was after the Second War. I went to Sweden and then to the United States to complete my training as a biochemist, and then finally in 1948 I started my career as a young professor at University of Louvain in Belgium.

HOLLANDER:

Doctor, was there any particular moment when you were working in this research for the laboratory that it suddenly came upon you that you decided to switch careers? Was there a

particular person, or event, or book, or experiment, or something that, at a point in time, you can say it changed?

DE DUVE:

I'm not sure that I can call it a point in time. It's probably a combination of circumstances. I must tell you that even though I wasn't really interested in science as a child, I was interested in, (A), solving problems. I mean, to me, a problem was a challenge, an intellectual challenge. Any sort of problem I loved. I was probably the only child at school who loved the examinations, because I was given problems and it was a challenge. That was the first thing.

I was interested in nature, because as a child I was a Boy Scout, so we would go out camping and hiking and looking at trees and animals and things like that, and collecting leaves. I did all that, and rocks. So in a way I was a naturalist of some kind, but simply not interested in the scientific basis of all that. So when I came into a lab, I had a sort of prepared mind for the kind of work we were doing there.

And then I was very fortunate because the head of the laboratory was a true scientist, and so he taught me to discipline my curiosity. See, I had an undisciplined curiosity. I would fantasize about everything. I was interested, but I wasn't really understanding. Especially, I did not understand or know the scientific strategy that consists in maybe imagining things, making hypotheses, but then go to the lab, do experiments to verify, test your hypothesis, find out whether it's true or not. And this man, his name was Professor Bouckaert, he was at the University of Louvain in Belgium, and he was a physiologist. And he taught me, I would say, the rigorous strategy of scientific research. And so I think I was really fascinated by the intellectual aspects. The rigor and the reasoning and the strategy fascinated me.

And then, since I had been a Boy Scout, I had been tinkering with things all the time with my hands, and I found that laboratory work, in itself, the manual work, was great fun. You had to do skillful things. You had to do things with your hands, and that I also—so there was a combination of manual skill and intellectual skill, and rigor, all that sort of crystallized, and suddenly I decided, "Well, this is for me." But probably I was sort of ready to do that kind of thing, yes.

HOLLANDER:

Going even back before that, when you were a kid, when you were thinking about the humanities, what did you envisage your life to be? A writer, a poet, a teacher?

DE DUVE:

Well, I didn't know. I knew what I wanted to study, but it's what I was going to be that became a problem. If I went into the humanities, what would I do after that? Well, I had to earn a living, so I would have to be a lawyer, I would have to be a teacher of some sort, or I would have to be a historian, or a judge, or God knows what, and nothing of that really attracted me.

HOLLANDER:

You studied, obviously, Greek and Latin. You were attracted by the Greek myths, by mythology?

DE DUVE:

No, no, no, no. It was the fascinating structure, the subtleties. You know, Greek and Latin are much more subtle than French or English. They allow a flexibility in the structure. And then there was just the beauty of the sound. I'm rather attracted by music. I'm interested in music, so languages, to me, are a form of music. And you know, I still remember, it's the only Greek verse that I remember, I think it's 28, in the *Iliad*, and it's [recites Greek]. Now, can you think of any music like that? It's fantastic. So all that fascinated me.

HOLLANDER:

Could you translate that for us?

DE DUVE:

Yes, it's about an old priest who was walking along the Strand, and he was walking there, [Greek phrase], silently, along the—what would you say—the Strand, and then [Greek phrase]. [Greek phrase] is "of the sea," and [Greek phrase] means a kind of sound. I can't translate it, the sound of the rolling waves of the sea. And you see, the word [Greek word] sort of brings up in your imagination the sound of the rolling waves. It's beautiful. I wish I could remember other verses. [Laughs]

HOLLANDER:

Did you study, in philosophy, Plato and the dialogues of Plato?

DE DUVE:

Oh, yes. I studied lots of philosophy. In fact, I was very attracted by philosophy, and I would say that I've gone around a complete circle, because my latest interest now, in the last ten, fifteen years, has been origin of life, evolution of life, significance of life, and then eventually there are philosophical aspects to that. Of course, as a child, I was awed by all the mystery around us, and I think that probably motivated me finally to become a scientist, because when I was exposed to science, I found that this was one sort of difficult but truer road toward increasing knowledge, because the strategy of science does call for a continuous reassessment of what you are saying and comparing it with reality, whereas in philosophy, there is no way except logic to find out whether your philosophical system is correct or not. That was the weakness of philosophy as compared to science.

HOLLANDER:

So, in a sense, you've come full circle.

DE DUVE:

I've come full circle, by a sort of rather zigzaggy sort of circle, but I've come full circle, yes.

HOLLANDER:

So now we're back to the nature of life itself.

DE DUVE:

Now we are back at the nature of life itself, but now, of course, I have the advantage of, well, knowing all I know, which is very little, but at least of having been a witness, and to a very small extent a participant in the greatest revolution in human knowledge ever in the last—it's just amazing that in a single lifetime of this old man, we've come from knowing practically zero about life, to a point where we can say we understand it. I think that's really fantastic.

When I say—let me correct this. When I say we understand it, we understand the basic mechanisms of life. This doesn't mean we understand all about every living organism, including humans. There are tremendous challenges remaining, but we do understand the basic mechanisms that we have in common with bacteria, with mushrooms, plants, and so on.

HOLLANDER:

When the Greeks were doing that thousands of years ago, they put it in the perspective of their mythology. It all fit within that context of those parameters. What parameters are you using today? Where are we—

DE DUVE:

You mean parameter of beliefs?

HOLLANDER:

Yes, exactly. Metaphysics.

DE DUVE:

Metaphysics. Well, I would say that I'm sort of, in my own little way, I think I've been a disciple of Descartes. Descartes, in his *Discours de la Methode*, starts by saying, "Well, I've started by doubting everything that I have been taught." So, the *doute methodique*, methodical doubt. So *I fait table rase*; I erase everything that's been taught and start from scratch. And then he starts, and he says, "[Latin phrase]." That's the first sentence, "I am because I think. I think, therefore, I am."

And so, I think I've been a Decartesian in that I've tried to sort of forget all the beliefs, the prejudices, the systems that I was taught in my youth. I was educated as a Roman Catholic. And because I want to start from scratch with an open mind, and using only the scientific approach as a way, now, what the conclusion is, is that the scientific approach has led me so far, but not to the ultimate explanation. The conclusion is also that the scientific approach is the intellectual approach, if you like. It's not the only approach to ultimate reality. But, for instance, art is another approach. It's another way to get in contact with ultimate reality: art, music, poetry, literature, philosophy. All those are different ways—mysticism, possibly—all those are different ways of approaching the ultimate reality, which remains a mystery.

HOLLANDER:

I know it's the ultimate reality, the why, the why behind the Big Bang, or [unclear].

DE DUVE:

I have no answer to that. Scientists have no answers to it. They can only tell you how, but they can never tell you why. So, you know, it all leads to the questions, but I think my own views are not sufficiently clear on the matter, is there a God? If there is a God, what is God doing? And certainly I don't think that our present view of the universe, our present view of living organisms, of evolution, and so on, would support a view of a deity that is continually interfering with nature. Life proceeds without any, let us say, extra natural, supernatural help. It's a purely natural process. Evolution, the brain, everything does work according to the laws of nature, and so the question then becomes, where do the laws of nature come from? What stands behind the Big Bang and all the various constants? There are endless discussions about that. I think there is obviously a mystery behind that, and you could call this mystery God. I have no objection to that, but I have an objection against a god who is believed to start by creating the world with a set of laws and then goes on interfering with those laws all the time. Why not make the laws such as they don't need interference with? So that's my religious attitude, for what it's worth. It's not very—

HOLLANDER:

No, no, it's very interesting. I think it's researching with life, and dealing with the essential matters of life at this point.

DE DUVE:

Right. You see, all we know about life today supports the view that it is a natural process that can be explained entirely in terms of the properties, the structure, the functions, the interactions of chemical molecules, and therefore, it also supports the view, which most scientists in the field would share, that this complexity originated also naturally. First, cells were the product of natural processes, very complicated, very difficult to reproduce in the laboratory. That happened a very, very long time ago, almost four billion years ago on Earth. But we believe those phenomena to be explainable.

HOLLANDER:

Doctor, [unclear] the Nobel. Why did you win the Nobel, and for exactly what?

DE DUVE:

Well, it's nothing to do with origin of life, evolution, or philosophy. As I said at the beginning, I decided, for reasons that are not important here, to become a biochemist, really because I was interested in a problem which was an action of insulin, and I had come to the conclusion that I could solve this problem only by means of biochemical techniques, and so I became a biochemist in order to solve this particular problem.

Now, I never solved that problem, because in the course of experiments that very early I had designed, because they would possibly provide me with some information that was needed for the solution of my problem, I ran into a chance observation. It's happened to me, it's happened to many other scientists, something that was not on my program. And it doesn't really matter what that is; it was just something that was intriguing and that sort of stimulated my curiosity. And so I put insulin on the back burner, said, "I'll come back to you later, but first of all, I have to understand this little thing. This is really too strange. I can't let it go by without understanding what it is."

And so I did solve that. It was not a very difficult problem. I solved the problem, but that created a new problem and stimulated or motivated new investigations, and one thing leading to another. Insulin is still on the back burner today. Incidentally, the problem is not yet completely solved by others.

Doing those experiments, I was led to enter a field that I had not considered as my field to start with, namely, cell biology. Because, again for reasons that aren't very important here, I started doing experiments in which cells are fractionated. Now, let me explain this in a simple way. A living cell is a very complex organism. It has different organs. Just as you and I have a brain, a liver, a stomach, a heart, cells also have different organs, not exactly the same functions, but organs. And so how does one—a cell is very small. You can't see it with the eye. It's about 20,000ths of a millimeter in diameter, so you need a microscope to see it. You need an electron microscope to see some of these little organs inside the cell.

How are you going to set about finding out what those organs actually do? Well, I didn't design the technology. It was designed by Albert Claude, who's a fellow Belgian, but who worked for twenty years at the Rockefeller Institute in New York. He was the founder of modern cell biology, and I had the honor of sharing the Nobel Prize with him in '74.

The technology is really rather simple. You take a very large number of cells, for instance, a whole liver, a human liver or rat liver or something like that, and you grind it in such a way, under such conditions, that the cells break open. So you get a sort of puree. They break open, but the little organs inside are more or less intact. And so you do that with some fluid so that finally you get a kind of soup in which all these things are floating around, no more intact cells, but little organs. So

it's like grinding the whole population of the world in a big blender, and then you have a soup with livers and brains and then kidneys and stomachs, and so on, all floating around.

So now the question is, how are we going to separate this. Because that's the problem, fractionate. The materials separate. Well, the technique was mostly centrifugation. That is, if you apply a centrifugal force to this, you put it in a tube and you run it in a centrifuge, which is a machine that goes round and round and round at high speed, then all these little organs, these little particles in the soup, will tend to move to the outside, because if you turn around, you're projected to the outside by something called centrifugal force.

And so all these materials start moving in that fluid toward the bottom of your tube, which is horizontal by the time the thing goes round. So if you stop at a certain stage, then the heavier materials have reached the bottom, and less heavy materials are still on their way. So you can, by this kind of technique, you repeat it on whatever several times, using higher velocities, therefore higher centrifugal forces, and so eventually you end up with fractions. They're very impure fractions, but they're fractions in which the heavier components are not purified, but at least they are concentrated, then less heavy and then less heavy and less heavy. So you've fractionated the cell contents according to the rate at which the sediment in a centrifugal field. And there're other techniques where you can also separate them according to their densities, a different technique.

And so using, and especially improving these technologies and following the enzymes, the biochemical functions I was interested in, I progressively, by simply biochemical methods, never using a microscope, progressively separated and purified different organs. It's as though I had ended up with all the livers in one big pail and with all the brains in another big pail and all the stomachs in that.

And so in this way, and by very complicated—well, not complicated, but let's say biochemical techniques, I finally identified two of the cell organs, and one I called lithosomes because once I had them pure, then I could go with an electron microscope and find out what they were, so eventually I was able to recognize that. But it was all done with centrifuges, test tubes, chemistry. And so the first organ I called lysosome, which means lytic particles, so my Greek education came back to me. The lysosome, in fact, is the cell stomach. That's where the cell digests its food, and I recognize it as a stomach because I looked at the enzymes, and all these enzymes were digestive enzymes. They cut molecules, proteins, and others, and so I came to the conclusion, and this, of course, has opened a huge field, because the cell stomach is involved in a very large number of different functions, depending on the kind of cell you're talking about.

It's also involved in a large number of diseases of all kinds, so that this discovery opened the huge field, not just for myself, but for many other people, and I assume that's why it was considered important. Although there are not so many organs in the cells, so to discover one was something. And then the second one is a bit more difficult to explain. I called it peroxy zone [phonetic], because it's got very much to do with hydrogen peroxide, but basically there are some chemical reactions that are taking place in the peroxy zones, especially the burning of certain fat components. And again, this opened a field. At the beginning, not very much, because not many people were interested in—although they were found in plants and in all kinds of different

organisms, but the last ten, fifteen years, this has become also a blossoming field of research, including medical research, because, again, many diseases are due to defects of the peroxy zones. I don't know whether you've seen the movie, I haven't seen it but I've heard of it, called *Lorenzo's Oil*. It's a true story. It's a story of parents of a child having one of those diseases caused by a peroxy zonal defect. The doctors say they can't do anything, and so they start trying to cure the child themselves by using certain oils, because this organ now has something to do with burning fat. The message of the movie is that do-it-yourself medicine is really going to save you, and they got some positive results.

Now, I don't know the end of the story. I do know that this had sufficiently powerful effect that, in fact, this particular oil has been tested clinically. The clinician started on these rare cases, starting testing this particular preparation. I don't know the details, but I believe the results were not completely negative. I mean, they're not curing the children, but maybe helping them to live a little longer.

HOLLANDER:

So it's not very hard to draw a line from your basis research to medicines that we are using or will use today.

DE DUVE:

It's not hard at all. In fact, I started my research, my career as a scientist for about twenty-five years with the motivation of doing exclusively basic research. I felt I was rather a snob about pure science. You know, I thought well, my job is to advance knowledge, or I prefer to say "understanding." And if I find something that's going to be useful, it's not for me to dirty my hands doing that kind of work. Clinicians, clinical investigators, pharmaceutical investigators, industry has to do it and, certainly, if it's going to bring out any money, that's not for me. Well, twenty-five years ago, I changed my attitude partly because I saw my own work sort of naturally moving into important medical applications, partly because I was originally trained as an M.D., as a medical doctor, partly because at that time, I had spent a fair amount of time, also, at the Rockefeller Institute in New York, where medicine and basic biological sciences are intimately pursued simultaneously, then partly also because of all the student revolutions—well, not called revolutions, but 1968, where, as you know, the students sort of tried to remind us scientists of our social responsibilities.

And so I came to realize that, yes, it's my right and privilege to satisfy my curiosity and try to advance knowledge because I am participating in a planetary effort, collective effort of the whole of humankind, and it's the duty of society to support that kind of endeavor. It's a major endeavor. But then I said, it's the duty to support me, but in return for this privilege of doing what I like and just pursuing my own curiosity, if what I find happens to have a possible beneficial application, I'm not talking about lucrative, the possible beneficial application, it is my social duty to help. That's my duty to society in return for the privilege of doing basic research.

So, as a result of all this, in the late sixties and early seventies, I planned the creation of a new

institute, which opened in Brussels—let's forget about all the details— in Brussels, is now a thriving organization, institution. It opened in 1975, which was a few months after I had gone to Stockholm to collect my prize, which was a happy coincidence, because that, of course, was a little helpful in getting the kind of support we needed in the beginning for this new endeavor.

So late in life, I did become not an administrator, because I left all that to others, but I did become involved in, let us say, creating an environment for research, and not just taking advantage of the environment offered by others for my own research.

HOLLANDER:

I think you've touched on an interesting point, scientists and society and the interaction between the two. How do you see that occurring today, or not occurring today?

DE DUVE:

Well, I think it's a difficult relationship, because—well, for a number of reasons, I have really thought enough about it to give it sort of in a Cartesian way, but I would say that, (A), scientists tend not to communicate with the public as much as they ought to. Maybe the media don't provide them with the opportunity to do that as much as they should, because what the scientists have to say is not very sensational, it's not the kind of thing that the media are particularly interested in.

Those scientists who want to try to communicate with the public, many of them don't have the talent to do that. You can be a very good expert in quantum mechanics or in evolutionary biology, and be completely unable to tell a baker or a lawyer or a politician what you're doing, in terms that they are going to understand. And if they don't understand, how are they going to support you? So that's a problem.

There is a problem, of course, in the general education of the public. I think schools don't provide a strong enough introduction to the sciences so that people would not be so totally illiterate as they are in science today. There are other aspects. The politicians generally are not interested in basic research, because they have to work over a very short time, distances, and therefore the next [unclear]. And basic research is a long-range kind of enterprise, and they want short-range results. They want to have immediate benefits. They want the science to produce economic returns and so on, to be lucrative. And so all over the world, they do not understand what the real function of basic research is. They don't support it, they're not interested in it, even though we and all my fellow scientists keep telling them that most of the practical and lucrative discoveries in the world have been outcomes, fruits, of basic science.

So there's a difficult problem in our dialogue with the politicians and with the general public, and then there is, of course, very much helped by the media, a tremendous competition by people who do not use the cautious rational approach of the scientists, but appeal with irrational arguments to fears in the general public, to esoteric beliefs in the general public, so that you see all these quack medicines, these pseudo-diets. You see all these campaigns against Frankenfoods, against genetically modified organisms, against nuclear energy. I mean, you name it, and there are tremendous forces, much stronger than the forces of science, that agitate against science.

Now, I'm not saying that the risks and the dangers they mention are completely nonexistent, but I think these risks have to be assessed in a rational way, with the help of scientists, and that, again, is extremely difficult because that kind of dialogue is impossible.

HOLLANDER:

And because when now dealing with somebody's reality and the realities are quite different over the years.

DE DUVE:

Right, right, right, right.

HOLLANDER:

Returning for a second to the centrifuge, would you consider yourself some kind of inventor, in a sense?

DE DUVE:

No, no. No, the inventions—well, the equipment was invented by others, by engineers and by commercial companies that develop better and better instruments. The technology, the basis technology was invented by Albert Claude and by some of his pupils in the United States. But at some stage, we were confronted with problems that could not be solved with the existing instruments and the existing technology, and so we were led to make improvements, changes, to the existing instruments and the existing technology. So you might say we have been, to some extent, inventors and we sort of also devoted a lot of time to the theory behind this. So, now in this approach, I was involved, but I had colleagues who were much more deeply involved because they were much more competent to deal with, let us say, mechanical engineering, the problems. I have a co-worker, Ahe Bofaevé [phonetic], he's about ten years younger than I am, has been with me all of his life, and he actually designed and built a completely new centrifuge.

HOLLANDER:

Based on your needs?

DE DUVE:

Based on our needs, exactly, based on our needs, and on our specifications, if you like. But he actually designed very cute, very clever, ways. This is a machine that had never been built before, that he designed and certainly played a key role in some of our experimental advances, yes.

HOLLANDER:

Doctor, just one or two last questions, bringing us up to today. You've come back, you said before, full circle, a combination of humanities and a basic search for knowledge. What if somebody was starting out today, and somebody were to come to you and say, "What can I read that will give me some kind of a world perspective, if you were to put all this in perspective," what would that be?

DE DUVE:

Let me make a joke. I'll tell him, "Read *Vital Dust*" *Vital Dust* is my latest book. [Laughs]

HOLLANDER:

Well, why [unclear]?

DE DUVE:

Well, no it would be, let's say—I don't want to say that as a personal advertisement, but it is a sort of—my latest, *Vital Dust*, is a sort of survey of this whole field, the origin of life up to evolution of humankind, the brain, consciousness, and even the future of life, present society, and so it gives sort of an outlook in readable words, I think, of the whole history of life and the problems it generates, and then it has a reading list which could help the reader, for each topic, find books on the origin of life, books on the brain, books on this and that, you see, so—

HOLLANDER:

Is there a central thesis through this book?

DE DUVE:

I would say that—well, the central thesis, which differentiates me a little from any of my fellow biologists, is that I'm a little more of a determinist. You know, nowadays there is a tendency, especially a number of best-selling authors have propagated this kind of doctrine, namely, that everything is due to chance—you know, the origin of life is not American because they don't believe in God, but it's the result of a highly improbable combination of chance events. Evolution has gone by from fortuitous, to fortuitous, to fortuitous, to fortuitous events, and finally, the fact that you and me and the rest of humankind exist today with the brains we have, with the achievements we have, well, this is a completely meaningless product of chance events. It just happens by myriad circumstances that might very well not have happened, we are here. And so we also are meaningless, because the odds were, to start with, that we would not be here.

Now, the odds from the beginning—now, the book doesn't say that the odds are 100 percent that you and I would be here and this young lady at this time and this location. That would be pushing determinism a little too far. But what I am saying in the book, and in general, defending in my lectures, including today, is that under the conditions on Earth four billion years ago, a little less than four billion years ago, under the conditions that existed on Earth at that time, when life

appeared, my thesis is, life was bound to appear. In other words, given the conditions, life as a natural process, had to arise, which means also that given the same conditions elsewhere in the universe, I would expect the same kind of life to arise. So that's one of the thesis. In fact, the subtitle of the book is "Life as a Cosmic Imperative."

And then the next concerns, of course, evolution. And there again, I defend the thesis that the mechanisms of evolution being what they are, the many possibilities that were available, being what they were, that the many different internal and external constraints that sort of restrict the possible pathways of evolution, that given all those factors, I consider that evolution in the direction of complexity also was more or less obligatory, that it had to take place.

Now, there is also a considerable amount of evolution in the direction of diversity. Mollusks—I mean clams, or mushrooms, or bacteria, or fish, or frogs, I mean, they all live very happily at their level of complexity, so they're not all driven towards increasing complexity; they're simply driven towards increasing diversity. From a single ancestral fish, today you have 10,000 species, and so on. But there is at the core of this phenomenon, with certain intermediates involved, there is a sort of constrained evolution in the direction of complexity. Whenever increasing complexity is possible, it will generally be selected for, because it brings increasing advantage.

Take the brain. Well, 600 million years ago, the first sponges had no brains, and the first jellyfish had maybe an excess of six nerve cells. And so, in 600 million years, you've gone from six to ten billion, with three billion in the chimpanzees, so in the last six million years, it's been from three billion to six billion. And so that kind of direction, I think, was more or less obligatory, provided the environment made it possible.

But I can't think of any situation where a better brain cannot be an advantage. And so whenever some animal, by a chance mutation, had a somewhat better brain than his congeners, if the circumstances were right, the odds are that he would be more successful in producing progeny, which is what evolution is all about.

And so I would say that evolution in the direction of complexity is a highly probable, also, event, which does not mean that if there is life elsewhere, it will necessarily lead to intelligent, conscious beings. It all depends on the circumstances. So, chance plays an enormous role.

And perhaps as a final comment on this, this kind of view opens the possibility that evolution is not over and that the event of humankind is not the crowning event in evolution. There's about five billion years left, apparently, for the Earth to remain habitable. After that, you'll be cooked by the enlarging sun, and so I would say that a great deal can happen.

HOLLANDER:

Doctor, just one quick question before you go. Have you had a happy life?

DE DUVE:

I've had an extraordinarily happy life. I've had a difficult life in many respects, but I've been

rewarded far above my desserts, and that's, I think, a reason for feeling happy. I'm not talking just about Nobel Prizes, but you know, what can render a scientist happier than to have helped in advancing knowledge, to have solved some problems. It's only a little stone added to this huge building, but making discoveries, as you know, is something that gives you tremendous joy. But it goes with all kinds of other problems. We are not just scientists; we are human beings. We are husbands and fathers. And when a scientist is as a sort of motivator, almost single-mindedly motivated to do what he or she wants to do, maybe people around them suffer a little, and that may have happened to my family.

HOLLANDER:

Do you feel that your plans generate a certain egocentricity that—

DE DUVE:

Well, you can't be a good scientist if you're not egocentric, which in a good way. I don't mean to say that you have to think only of yourself and consider yourself the center of the universe. Not that kind of egocentricity. I mean, I don't talk about the kind of egocentricity that goes together sometimes with being a great movie actor or a great rock singer or something like that. No. But what you need is single-mindedness. You simply cannot afford too many distractions, you see, so you really have to concentrate. Even today, I'm—you ask my wife, and she'll tell you I'm often absent. I'm with her, and at the same time, no, I'm not with her. And she's learned to live with that, and she's an artist herself, so she doesn't really mind too much. We've come to the stage now where we do a lot of communication and talking and we've always talked, of course. But nevertheless, I would say that, yes, a good scientist, a successful scientist has to be single-minded, and you'll never earn a Nobel Prize, and that's not a mark of a single scientist, but let's say, if you consider that you start your work at nine o'clock and leave at five o'clock in the afternoon, Saturdays you go out with Mom and kids, and so on, It just won't work. I've worked all my life, I could say day and night, and seven days a week, *with* distractions.

HOLLANDER:

One last very personal note. What are some of the things you dislike, in a very personal sense? Just one. Avocados?

DE DUVE:

You mean things to eat?

HOLLANDER:

Anything.

DE DUVE:

Nobel Voices Video History Project, 2000-2001

Christian De Duve, June 28, 2000, Archives Center, National Museum of American History

Well, my body dislikes avocados because it's allergic to it, otherwise I probably would like them. No, I would say that what bothers me most in other people is intellectual dishonesty. I think that is really something that bothers me most. And the next best thing, or worst thing, is vulgarity. So I'm not perfectly happy in the present-day world.

HOLLANDER:

Thank you very much.

[End of interview]