

## Chapter 52

# JACQUES MAYAUDON

Louvain-la-Neuve

May 31st, 1997

**VM = Vivian Moses; JM = Jacques Mayaudon; SM = Sheila Moses**

*(Editorial note: Dr. Mayaudon's spoken English is not good. He used a number of French words and both these, and some of his remarks in English, are often difficult or impossible to decipher. The discussion was attended by colleagues who intermittently offered translations of French words and phrases; some of these can be heard on the recording but have not been transcribed.)*

**VM:** This conversation is with Jacques Mayaudon on the 31st of May, 1997 in Louvain-la-Neuve and he's just put on the table a book on *Isotopic Carbon* by Calvin and his co-workers.

**JM:** Thank you, my colleague. This book has changed all my life, professional life. I had this book in 1950; I understand what I must do for my research and I spoke about this book to my professor, *directeur*, Professor Simonard and also the Director of IPSEA, Institute of Research, which paid me. All these persons understand why I should want to go to Melvin Calvin's. For this reason I learn English and I take the *Elizabeth* boat transatlantic to New York...

**VM:** Oh, the *Queen Elizabeth*?

**JM:** The *Queen Elizabeth*, yes. I stay one week in Tudor Hotel and after that I took the airplane past Chicago and I go to Berkeley. After I look after a *(pace to)* in Berkeley, my first visit is for Professor Calvin.

**VM:** OK. Can I ask you some questions about your education when you were young?

**JM:** I was always interested by understanding the action of the environment of health, the chemical and microbiological process; the physical process also.

**VM:** When you were a student, which university did you go to?

**JM:** Always in Louvain.

**VM:** And what did you study when you were...which subject did you study?

**JM:** I was an engineer chemist in the agricultural industry.

**VM:** An engineer in the chemical and agricultural industry. When did you finish your studies as a student?

**JM:** I studt, I finished in — wait a minute now...I don't say the mistake — in 1948 and immediately at this time I wanted to go to the chemistry laboratory in the State and we had always an examination and people, as you, take a question: it was Professor Simonard. He looked (*at*) me and immediately he said, please come to see me. So to finish: at this time I study about the problems about cheese, Belgium cheese like (*indecipherable*), and this was the head of my doctorate — understanding the biochemical process of maturation of this cheese. And this, it is very important for me, because I isolated the microbe which was not *Bacterium mimens* as people said but a new one — a microbe which produced indoleacetic acid. It is a growth factor — indoleacetic acid.

**VM:** And so you finished in '48...

**JM:** I finished in '54.

**VM:** Your thesis?

**JM:** My thesis. And a week later, because I received a fellowship from IPSEA, I go and see Professor Calvin so all is clear.

**VM:** Right, now all is clear. So you arrived in San Francisco or Oakland by aeroplane.

**JM:** All people know IPSEA and Professor Calvin. This is interesting: we must go and see Professor Calvin because in Belgium we must apply isotopic carbon.

**VM:** So you had already written to Calvin to explain your interest.

**JM:** Yes, sure.

**VM:** And had you agreed with him what you would do in Berkeley?

**JM:** At Berkeley it is not the same because all people were studying about the photosynthesis process with algae. But at this time it was difficult to collect and purify the enzyme. It was not possible, not possible. So for me it is algae (*indecipherable*); like Shibata said, it is not good for me. I want to see a vegetable or algae which it could be extract enzyme. So I go and see about Berkeley mostly about Sunday or Saturday because all is free. I look and I chose the best one using spinach, not to eat but to extract the enzyme.

**VM:** But when you arrived in Berkeley, where did you live?

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**JM:** I live with a very kind person, a pensioner, on a small street or avenue, very kind, very kind. I eat at the Faculty Club. I was a member of the Faculty Club.

**VM:** How did you find the place to live?

**JM:** By myself. I look. I see to rent...

**VM:** I see. You had no car?

**JM:** No, never. Because car cost money. I had a six-month grant; I stay one year.

**VM:** So you were always short of money.

**JM:** The problem, I can show to you the papers, it was impossible to take...even in summer time you must work in the lab., day and night.

**VM:** In order to produce results.

**JM:** Before I go to Calvin, I go to the Donner Laboratory. Here I speak, to look hard to do label carbon-14 labelled like a vegetable, like cellulose. In Donner laboratory we can do. When I come back here I prepare by myself labelled cellulose, labelled enzyme, when I say labelled, it is carbon dioxide it is carbon-15, no?

**VM:** 14.

**JM:** *Oui*, carbon-14.

**VM:** Who did you talk to in Donner Laboratory? Who was the person that you talked to?

**JM:** It was a very kind woman, her name now I forget, but her superior was Tolbert.

**VM:** I see, yes.

**JM:** Very modern, very modern.

**VM:** So you knew Tolbert well.

**JM:** And changed all things this for all my life: why? Because I was interested (*indecipherable*) because he looked at rats and mice. "I don't know," he said, "metabolism." This is when (*indecipherable*) because when I will back to Belgium I will change mice rats by microorganism, by soy. For this reason I write a book I can show to you. *Application of Radiorespirometry Designed by Carbonation*. Because I went to this Donner Laboratory. If I don't go...if I go immediately to photosynthesis, this was not possible...I have no idea.

**VM:** How long did you spend in the Donner Laboratory?

**JM:** Six months.

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**VM:** Six months!

**JM:** And six months with Benson. You can see the papers — day and night, day and night. (*Indecipherable*) People said “will you burn your candle both the both sides?” When my mother say to me, “Jacques, *allez*, go and eat now, you can sleep now and you can stay now”.

**VM:** So you had no social life at all?

**JM:** No.

**VM:** Social life: you did not have friends there?

**JM:** I had friends — Bourdon. But in the lab. my best friend was Benson, Andy Benson, because he understand my objective. He was also very interested by extraction of enzymes. We both, we give the name of the enzyme...

**VM:** Which name?

**JM:** Ribulose carboxylase.

**VM:** Oh, you and Benson gave the name...

**JM:** We have the only, both, we study because we can extract the enzyme.

**VM:** So when you had been in Donner for six months you moved to the Old Radiation Lab. to work with photosynthesis, yes? And by that time you already knew how to use isotopic carbon...

**JM:** Oui.

**VM:** ...which you had learned? And you talked to Benson about the enzyme?

**JM:** About the enzyme.

**VM:** And what did you do?

**JM:** And, with his help, he chose for me the laboratory when I could go on. You can see the picture, the process. It was not from Melvin Calvin — it was not possible. He has not the the apparatus.

**VM:** So did Calvin know about what you were going to do? Did you talk to Calvin?

**JM:** Yes, but you see from this, for instance, not from Calvin's lab. But *alors*, one thing, in '55 or, I think, '56 Andy go away, I think as a professor in Pennsylvania University.

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**VM:** That's right, yes.

**JM:** And I tried to have a contact but it was impossible to have a contact with Benson and Melvin was very occupied. I saw him in Brussels. He was very kind with me, Benson, because I make chromatograms like this one (*showing some papers*). (*Indecipherable*)

**VM:** Where was this paper published?

**JM:** At Brussels.

**VM:** In the International Congress of Biochemistry? '55, yes.

**JM:** And Benson, was, I remember, at the Metropole Hotel.

**VM:** In Brussels.

**JM:** Yes. So I invited him, his chamber...

**VM:** ...room, yes.

**JM:** Room; it is...

**VM:** Suite?

**JM:** Large apartment. His wife was there, I think, two boys, two people, girls I think. We had a very good meeting with him. But you know the problem is, after this any silence.

**VM:** But when you met Calvin — you met Calvin in Brussels?

**JM:** Yes, yes.

**VM:** This was '55, before you went to Berkeley?

**JM:** No, I went already. I come back in January '55.

**VM:** I see. And you were in Berkeley for one year?

**JM:** *Oui.*: January '54 to '55.

**VM:** So you saw Calvin...?

**JM:** And six months later I saw...

**VM:** I see. And then its...

**VM:** I understand now. OK.

**VM:** So this is a paper with you and Benson and Calvin in 1957, *Biochem. Biophys. Acta*.

**VM:** How far did you succeed in extracting the enzyme? Were you able to purify the enzyme?

**VM:** It would fix carbon dioxide in a test tube?

**VM:** So, you were the one, really, the first one to work with the actual enzyme that fixes carbon dioxide?

**VM:** Right. I see. That was very interesting, then. So that was a very important contribution that you made in Berkeley in '54-'55. And you say you had to work very hard in that period to do this work.

**VM:** Did you have an opportunity to visit other places in California or in America?

**VM:** You worked with Stanier and Doudoroff. Did you publish with them as well?

**VM:** Yes.

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**JM:** Because the enzyme which produces IAA (indoleacetic) is not killed by heat. Very important.

**VM:** So, is this enzyme and these bacteria used in industry to produce the hormone?

**JM:** I think so. It will be very important. Now I will make a...

**VM:** A patent?

**JM:** A patent, yes. So the (*indecipherable*) photosynthesis analysis examination of a new enzyme at that time (in '54-'55) was very important. In my future it was only a step. I was always interested by the study of the environmental process even as I see it in photosynthesis and also in cheese but also certainly in soil, soil fertility, because this plan interested IPSEA. And now after 50 years I see it is the information I obtained in Donner Laboratory. It is very bad that I don't remember the name of this young lady, Ph.D., which worked with Tolbert: blonde woman but I don't remember her name. And I study and was very interested by the ionisation chamber. And now in my lab. you will see this...

**VM:** ...ionisation chamber.

**JM:** I think the last one which works again!

**VM:** In the whole world?

**JM:** Yes. I have made a chapter in Solberg's (*spelling?*) *Chemistry* in English and American and I studied on the soil fertility and all kinds of processes like in desert or in forest and so on. It is always because I went six months in Donner Laboratory.

**VM:** So that six months in Donner sounds like...

**JM:** Changed all my life, all my life. And now we've heard Dr. Yen application because before I didn't know anything about cancer. She know but her friend Dr. Walon, who is also a woman, we have fresh breast tissue and it is our estimation that in two hours, even less, we can look the kind of cancer.

**VM:** You can identify...

**JM:** Yes. It is always because it is the culmination of the six months I passed in Calvin's laboratory in Donner.

**VM:** Well, I think that has had a most remarkable effect on your life, perhaps...

**JM:** *Alors*; it was (*indecipherable*) in life. Why I stay here? I see all my colleagues are already going away and I didn't. Personal (?) But now you will say if we can stay here even, we will look because I can synthesise also some protocatechuic acid — protocatechuic acid I synthesised by myself. So what I ,hope, what I think I will find it is really the correct label carbon dioxide substrate which is the key (..?..) to find

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(*whether*) this tissue will be cancer or not. We must look not when it is too late, before: when the tumour is there, it is cancerous or not. When we will find the right labelled substrate (*indecipherable*)...

**VM:** Which substrate do you use now for testing?

**JM:** I can show you. You will see, you will see, you will see. That's a good question. Now, for the future by radiorespirometry I study work in Melvin Calvin's. It is important for me not only to study the question about nature — fertility of soil — but in medicine. We think that by this very simple way we should make a new radiorespirometer and, with new radiorespirometer without making too many biochemical or enzymatic experiments like I show to you now only in very...

**VM:** Direct?

**JM:** Not direct; directly to see even in South Africa, even in Congo we can find the way to know this is cancerous or not.

**VM:** You want a simple technique...

**JM:** ...simple technique.

**VM:** Which you can use anywhere in the world, easy to train people, so they can discriminate the differences...

**JM:** And by the way of Dr. Yen, even we now have a Japanese laboratory interested by Michele Schultz (?). Now for you, if you know that, if you find because it is an apparatus with no dinacons (?), anything, no questions, no construction now.

**VM:** Yes, sure.

**JM:** I want to know, maybe in California or in England, I am very interested for the future now I want to can make it a new radiorespirometer with (*indecipherable*) method...even in England or in California or even in Taipei, I don't know. It is very important. There is only one which works and it is very important to do this. It is a question of great concern because I can show to you now my biochemical process. It is very difficult to submit success, too much, too big, too complicated. In summary, all the scientific life, my scientific life changes because I went to the laboratory of Melvin Calvin and I read and I can apply some radioactive techniques in Calvin's. And this technique was in this book *Isotopic Carbon*.

**VM:** You have not said very much about your relations with Calvin personally. Did you have much opportunity to talk to Calvin?

**JM:** About this point, it was for him quite different from other people. I understand that. He was concerned...he and me, he don't say anything.

**VM:** Really?



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**JM:** He was expectative (*had expectations?*). You understand. You are in the lab. You have ten people who work on algae and you have one Belgian. What do you say to this Belgian? He works on spinach!

**VM:** So he didn't understand your working on spinach?

**JM:** He was thinking I am crazy! But one year later...

**VM:** He realised.

**JM:** He realised.

**VM:** But did you have a good relation with Calvin when you were there?

**JM:** *Oui*, no problem, *pas problem*. He invite me in the family, eh?

**VM:** Sure.

**JM:** Sure.

**VM:** And so the few months when you were in ORL you worked with Andy Benson on the enzymes?

**JM:** No, the first three months I worked with Tolbert.

**VM:** Yes. But then you went to ORL.

**JM:** And after that I go to ORL.

**VM:** And you worked with Benson.

**JM:** With Benson; Benson take me in charge.

**VM:** Did Benson stay there the whole time you were there or did he leave?

**JM:** Yes, he leave the end December and I leave, I think, six weeks later.

**VM:** In January-February?

**JM:** *Oui*, yes.

**VM:** I see. So you worked closely with Benson?

**JM:** Yes, yes, very close.

**VM:** Have you been in contact with Benson since that period?

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**JM:** Oh, sure, sure, sure, sure, *oui*. Even now.

**VM:** But you have not seen him in America?

**JM:** No, not in America but he has seen me one time. He has seen me at Louvain. *Voilà*.

**VM:** So, your relation with Calvin — did you see Calvin; did you visit his family?

**JM:** During this year I have received almost two invitations and I go and see his wife and two children and we have a good talking. It was very friendly with him, no problem.

**VM:** Did he ask...?

**JM:** *Attendez!* I must say also when we publish (*indecipherable*) he accept my point of view and when I was there any scientist as he accept I go six months in the Donner Laboratory. He knows also I find Professor Stanier and he accept also I am working on spinach. He accept my suggestions.

**VM:** Yes, OK. And I see that eventually, of course, he referred to your work in his paper and he also published together with you a paper.

**JM:** Yes. He accepted to publish my experiment.

**VM:** But it took him time to become interested.

**JM:** Yes, yes: no problem.

**VM:** So did you have...I see that you worked very hard when you were there. Did you have time to relax? Did you have time to go to the mountains when you were in California?

**JM:** With the family of the lab., eh? *Alors*, I saw only with persons of the lab.: Mount Lassen National Park and Death Valley, so...

**VM:** Yosemite?

**JM:** Yosemite Park, *mais oui*.

**VM:** So you saw something of California.

**JM:** And the Calvins was there — not every time. He was a very good...I don't know, he make seminars and he was always there and we had always good talking. He tried to people go ahead; yes, no problem.

**VM:** To encourage people.

**JM:** Yeah, yeah, encourage people, sure. Even I. I have a way that maybe he don't understand because for about ten years he work on algae and then people, strange

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people, talk about spinach. But he accept the results, eh? Because you see, eh? Papers on research; my three chromatograms are there, no problem.

**VM:** Did you find him...when you saw how he was the leader of the photosynthesis, do you think he was a good leader of that work?

**JM:** Yes, yes. For me I was not following Melvin Calvin, I was (*indecipherable*), not success. The success of my life was over (??) because I have a good relationship with Melvin Calvin and people know he very influenced my future.

**VM:** Sure, sure. Well, I think that has been a very interesting story you have told us and, as you say, your contact with that book and with the lab. in Donner was a very important part of your life and you have told us something of how you have developed...

**JM:** Even now that I am old the University and the faculty accept I am there. Madame Yano (*a colleague*) work with me, no problem. Not any difficulty.

**VM:** Very good.

**JM:** I keep this one; I have two laboratories — no problem.

**VM:** Very good.

**JM:** You will see: a grand (*large*) laboratory: my radiorespirometer is there; no problem.

**VM:** Well, I think it remains only for me to thank you for your hospitality, for your interesting discussion and for your very brave attempts to speak English into a tape recorder.

**SM:** Very successful attempts.

**JM:** I should like, *mais* I have no money, to invite him (*you?*) so after one month I can speak English with him (*you?*).

**VM:** Absolutely. Maybe we will find a way.

**JM:** You understand my poor English!

**VM:** You understand my poor French! Maybe WE will find a way so we will stop now and go and have a look at your lab.

**JM:** *Eh bien, voilà.*

**VM:** Thank you.