Corrected transcript

Interview with Professor Frank Vella and Professor Alex Felice at the University of Malta in December, 1989:

Malcolm: Could you kindly tell me a bit about yourself?
Prof. Vella: I graduated in 1952 from the Medical School of the Royal University of Malta as a doctor, as a medical person M.D. I was then a Rhodes Scholar for Malta for 1952, so I proceeded directly to Oxford immediately after graduation. I spent three and a half years in Oxford. I did an Hons degree and a little bit of introduction to research. After that I got a position at what was then called the University of Malaya in Singapore before Singapore became independent and Malaya became independent and it was then that I started my real interest in haemoglobin studies and that was a very productive period of my life ('56 to '60).

That work was published in a lot of small papers, with rather interesting findings, and the University permitted me to present all that research for a PhD. Then, after four years in Singapore, I had an offer to go to Africa, the University of Khartoum, (1960-1965 – five years) in the Sudan. This was a promotion for me in that from lecturer I went on to a senior lectureship. That was very exciting because it was then possible to do studies in Africans as opposed to studies in Asians.

It was productive and I also came across different diseases from Asia to Africa. Rather different patterns: a lot of sickle cell disease in Africa. When I was in the Sudan, we used to have three months leave every year during which I used to come to Malta. I used to spend a little bit of time dabbling in research with glucose-6-phosphate dehydrogenase deficiency testing, a little bit of bar body testing and sexing: problems of nucleii chromosones and so on, and an early survey for the frequency of thalassaemia by a rather simple, primitive method.

After that, I went to Canada to the University of Saskatchewan in central Canada, where I was treated very well. Within three years of arriving at the University of Saskatchewan, I was honoured by the medical students as a Professor of the Year of the University. I did a very extensive study on abnormal haemoglobins in Canada, a study that covered over a quarter of a million people and discovered six new variants, six new haemoglobin varieties in Canada never seen before. I was the first person really to do haemoglobin work.

Alex: What's the ethnic background in Canada? Where are the Canadians coming from?

Prof. Vella: I did work in Saskatchewan but I used to get blood samples also from Winnipeg, Alberta and Ontario. They used to be shipped into me – big boxes, 500 blood samples. They were a cross-section of world populations – Anglo-Saxons, Ukrainians, Germans – it doesn't really matter. Haemoglobinopathies are not common there. We found haemoglobin S or haemoglobin E and about 30 different variants, some of them exceedingly rare – some first time ever discoveries, some second and third findings and then some common ones: haemoglobin C in negroids and haemoglobin S in blacks.

This was the pioneering time for those who were discovering abnormal haemoglobins. The techniques were still quite simple but actually they were flogged very hard. Those simple techniques gave fantastic results in their ways.

Malcolm: What, in very lay terms, is haemoglobin and what are variants of haemoglobin?

Prof. Vella: Haemoglobin is the red protein in blood. It is present in red blood cells. It is composed of two types of protein, each molecule has four parts, four sub-units of two different kinds. Each kind is produced by a particular gene, so the protein is what the gene produces. Now the gene can undergo mutation, change. When the gene undergoes mutation, you can get an abnormal haemoglobin. We call this a

variant. Normal and a variant of the normal. But up to now there must be close to 600 varieties. Before I started my research there were maybe ten at the very most. I discovered nine or ten. But I was also lucky in that I found several instances of second findings. The variant had been discovered and I found it in another group of people.

Alex: These are always instructive. There is always something to learn by doing this kind of thing. You can find a number of families that can have the same variant in the same community; in the same population. Then, you can make comparisons with other populations.

Prof. Vella: Because basically you're dealing with population studies, so you're comparing ethnic groups. For example Malays or Ghurkas or Indians from a part of India and Chinese from a particular area with people from England or Italians or French or Spaniards.

Alex: So, we call them markers of population but also markers for gene activity or gene control. By studying the types, quantities and associated blood changes in people who have one or other of these variants, there is a lot that we can learn about the structure of genes and how genes work in the human being without having to do various manipulations in the lab. (Then we can devise the laboratory manipulations on the genes). I think that is now the great interest in haemoglobin

Prof. Vella: Things have changed dramatically. In those days, you see, we could study the product of the gene; there were no methods for studying the gene directly. The tremendous advances in what, the last 15 years since 1975, have been that you can go directly to the gene.

Alex: Since Boyer, Cohen (who were responsible for the recombinant DNA revolution).

Prof. Vella: So the interesting thing is that we were finding all these abnormal products, and then it was possible to study the genes that make them and the results from the product matched very beautifully the results for the gene structure. So, they really confirmed each other.

Malcolm: Incidentally, has any haemoglobin variant been discovered

among the Maltese?

Prof. Vella: Yes, quite a few.

Alex: What we 'll do is we'll make a table. There are a few variants disproportinate in number compared to the Maltese population. But, I think it is also about time, too, in connection with haemoglobin and haemoglobin variants and haemoglobin abnormalities, to introduce the idea of thalassaemia

Prof. Vella: thalassaemia is a hereditary disease. It's been known since 1926. The interesting thing about it was that it was described in America in people of Mediterranean origin. That was the interesting thing. In those days when there was still a lot of malaria and a variety of things the condition resembled the complications of malaria so there was pallor, a little bit of jaundice, a big belly with a big spleen, bone marrow changes and X-ray changes of the bones and so on.

So it was rather amazing that this gentleman called Dr. Benton Colley, a distinguished paedriatrician from Chicago, reported this condition in the United States and, within about a year, Italians and even some Greeks started reporting that even they've seen this condition many, many times and they always attributed it to malaria. So then people started to call the condition Mediterranean anaemia. And then a little bit later, somebody said Mediterranean anaemia is not right, somehow, so somebody suggested the name Thalassemia, from the Greek word *thalassos* which means "the sea" in Greek. The sea, for the Greeks, is the Mediterranean, you see, and the word has stuck. It is not a good word because really it says "sea in the blood", which does not mean much.

Alex: It is also a worldwide condition, not limited to the Mediterranean. It recurs across a belt that starts on the Western part of the Mediterranean, the Straits of Gibraltar, goes right across the Mediterranean – parts of Europe and northern Africa and anything in between, which is us. It goes right through the near and Middle East to the Far East and into China, especially the southern parts of China.

Malcolm: And it was then imported into America?
Prof. Vella: Yes. There were immigrants, basically: Armenians, Syrians, Palestinians and Greeks. It occurs even in Chinese, so much so that there was a time there were some people at the Pasteur Institute – the guys who used to work in Vietnam and places like that – they used to see thalassaemia in Chinese so frequently...
Alex: thalassaemia in Chinese can also be pretty bad and is just as severe as thalassaemia is in the Mediterranean.
Prof. Vella: But they started calling it ''La Cinemie'' in French – Chinese Disease – ''La Cinois''. But, we're stuck with the word thalassaemia. The exciting thing now with thalassaemia is that, in those days, in the 1950s, we thought there was only one variety. But then, with the studies of haemoglobin, we started to show that there are many varieties.
Malcolm: thalassaemia is a disease related to the blood?
Prof. Vella: Yes. thalassaemia is an anaemia on a hereditary background. It's not an acquired deficiency because of nutrition, ...
Alex: Something that one is born with. Something one gets from one's parents and you pass it on to one's children. The relationship between haemoglobin and thalassaemia is: before we talked about the haemoglobin variants, chemically abnormal haemoglobins, which is a qualitative abnormality of the haemoglobin gene. thalassaemia is a quantitative abnormality of the haemoglobin gene.
Prof. Vella: Due to defective regulations so that instead of producing a normal amount, you produce a subnormal amount.
Sometimes you produce a mutant, which doesn't survive long enough so you produce a mutant that has a short life. So, effectively, you have a low concentration of haemoglobin.
Alex: So the red blood cells do not get filled with normal haemoglobin as they are supposed to do. So they are smaller and empty. The blood

cells don't live long enough in the circulation since they are destroyed. This effects small children. For example, a two-year-old needs to have a haemoglobin level of 12 grams whereas somebody who has a major type of thalassaemia disease has a level of 4-6, which is very serious. The kids look very pale. They remain small, they don't develop well, have several complications of the anaemia. They need large quantities of regular blood transfusions. They used to need this. Now the picture has changed, somewhat lately, for these children.

Malcolm: Tell me a bit about your work at Saskatchewan during the past 25 years.

Prof. Vella: This could be described as having two phases. About 15 years of research. Then, the research started to slow down for a variety of reasons. Being a university professor, I started to place more and more emphasis on teaching and education and it is that, then, that brought me in contact with the International Union of Biochemistry and the chairmanship of the Committee on Education, which regulates professional training and professional standards for the international organisation of biochemistry.

In the last ten years, I haven't done much research related to haemoglobins and so on, though I still do reviewing of scientific papers for journals. I started to dedicate more and more of my own expertise and energy, dynamism and enthusiasm to improve teaching at university level. So that has taken me all over the world almost, organising meetings of university professors.

Malcolm: Seminars?

Prof. Vella: More than seminars. They are usually three-, four- or five-day workshops, rather intensive to which I take two or three other people from various parts of the world with me as a team and we bring together 25 to 50 professors of our subject from a country, from a nation. It could be India, South Africa, Brazil, on invitation.

Malcolm: And you would grill them very rigorously?
Prof. Vella: We would have very intensive discussions on objectives, how to meet these objectives, difficulties that these people experience, analysis of the difficulties, how would we outsiders try to solve those difficulties. And then a lot of indirect teaching.
Malcolm: Training the trainers.
Prof. Vella: Yes, that is basically our operation. So, in the last five years I must have given 20 of these workshops in 20 countries.
Malcolm: What is the major satisfaction you derive from your work at the moment?
Prof. Vella: The major satisfaction is internal, number one, for the simple reason that it is nice to be able to do things that you strongly believe in. And it is also very gratifying to be invited to do these things by people who don't know you but who have heard of you and your work. The links that are formed. There is a certain amount of transfer of enthusiasm for new methods, for a rational approach to university teaching, for the development of intellectual potential that exists in students.

There is a big problem in university education. Few university educators, professors, have any training in their educational jobs. They are hired as experts, because of their doctorates, the number of papers they published. They have no clues, very little experience, except their own personal experience, of teaching. So they tend to repeat what was done to them. If the professors learnt through very bad lectures, then, it's normal for students to receive very bad lectures, somehow. So that's a very serious matter.

But there is a tremendous groundswell developing in universities to train new faculty members as part of their appointment; to give then in-house, in-service introductions to teaching so as to try to get more variety. We want to change from the passive mode of learning, where the professor does all the speaking and all the work.

Alex: My experience at universities is that for a fully fledged academic person in the United States system, about one third of your effort should be dedicated to teaching. That might be actual formal undergraduate teaching; or it might be the type of teaching that occurs through contacts with masters or a doctoral degree candidates. Conferences, seminars must be a very important way of teaching.

Prof. Vella: When you think of teaching at a university level, really, there are two phases, two levels. One is the classroom teaching with neophytes, they are new people just out of school where you are dealing with 100, 200, 400 students. Then you have the other aspect of small groups or individual teaching where there is more intensive contact, one to one.

We believe that most teaching that occurs at universities, quantitatively, is classroom teaching, mass education of university students. And it is there... and most people who will go to university will take a three- or four-year degree and stop. So that is their one opportunity, really, to expand their intellectual capabilities and so on. Their major exposure in life to that sort of education. Real education only occurs when the individual is intimately involved in the educational process. You only learn when you are active in the learning process. Most of the classroom teaching is passive and the student is supposed to take what is taught and learn it, memorise it, learn to use it and so on.

Malcolm: I have a particular experience at the University of Malta, I attended a couple of evening courses. Since I had experience in journalism on the job, I brought to the classes a certain amount of experience which academicians through formal training did not have. So, I found that, very often, they weren't allowing the scope for this one to one exchange which people who have the experience can give to academicians themselves.

Prof. Vella: That's perfectly valid. The reason for that, of course, is expense and cost. If you have 200 students, it's very, very difficult to give them one to one attention.

Alex: But that raises other issues of how many – student numbers versus.... Staff ratios.

Prof. Vella: But there are techniques. Today, there is a tremendous amount of knowledge and wisdom on how people learn. And there are what are called "small group techniques" that can be used in large groups. You can involve 400 students in a one hour experience in which each of those 400 students does something. It doesn't have to be one to one, it can be one to 400. The important thing is that the student be active during the period; small group techniques in large groups.

You can talk to people about this but telling them does not mean teaching them. You've got to learn these techniques for yourself from experience, you've got to do small experiments, try a thing out once. See how it goes. Be convinced that this is an important way to go. Learn from your experiences, good or bad, and modify. And over three, four or five approaches, then you could become a master of the art. That's all there is to it.

Alex: Does that mean that one needs to have a larger variety of teachers that have deeper expertise, say, in the different sub-specialities of a course or a programme – like biochemistry and molecular biology? We have so many sub-specialities: metabolism, proteins, genes, DNA and things. Would it not be so that to do that kind of teaching, then you need to have an expert in the individual subjects?

Prof. Vella: Alec, what you are saying is valid, but it is not all that really important because, if you look at human intelligence, what you can do with your brain, and there are three components.

The first component is the type of wiring, the type of cells that you've got, the power of your brain. That is, to a large extent, not completely, genetic.

Then the second component is the skills that you have learnt, the intellectual repertoire of skills that you have learnt. The skills, we believe, are permanent. Having learned a skill, that stays with you for the rest of your life.

The third component is contents, information, which are memory based. Memory is transient – your ability to remember things. A lot of our teaching is based on content, memorising. A tremendous amount of knowledge which you need to acquire. We believe that it would be much easier if the student learnt the skills that are necessary to handle, to inter-connect, to associate, to analyse, to synthesise, to extrapolate, to solve problems, how to use a library.

Malcolm: Are you saying that, in connection with the skill to learn, it is better to know where to get it from and how to get it than to be able to remember it all at the tips of your fingers?

Prof. Vella: You should know how to get it; where to get it; what it means; how to make meaning out of it; how to compare this body of knowledge with another body of knowledge; how to see the processes by which that body of knowledge was obtained; how that body of knowledge or those bodies of knowledge can be extrapolated, can be applied tomorrow; how they will relate to ordinary every day life.

So, it's not just a case of: find it in this book, ''How to Use a Library''. There are skills. You don't have to read a book from cover to cover. If you saw this morning, I was here with Alec. I picked up one of those volumes and I flipped the pages, like that. I browsed through it.

Alex: This becomes even more important, nowadays, because the content changes so fast.

Malcolm: And the content of material that is produced is so voluminous that it's impossible – there isn't enough time during the day to go through it all.

Alex: So long as your skills are developed, perfected, and those are with you, then you can change your understanding of the content as medicine, biochemistry, evolves into...

Prof. Vella: You need content, because one of the things that science is, it is a vocabulary. If you do not have the vocabulary, you can't talk science, not really. But the vocabulary is not everything and we've been emphasising a great deal the vocabulary. But what we are interested in is the words: what they mean; what is the history of those words; how words relate; how you can connect words together to make beautiful sentences and beautiful paragraphs.

Malcolm: Now, what you are trying to do is something different.

Prof. Vella: What we've been trying to do is to try to change the teaching of biochemistry from the traditional memorising mode to the more interesting understanding mode and the learning how to learn mode, because if you've got that, then you've become really educated. There are many people who have fantastic memories. They know a lot of ''science'' but they don't understand science. It is amazing.

It is because they've never practised it. And if you ask these people to put it in simple terms, explain it to your eight-year-old daughter in simple terminology, they can't do it. Because they're so caught up in the jarg So, they haven't gone beyo the information to the essence of the information, the ideas of the information.

Alex: This brings up the issue of role models. I am now trying to translate what we've been saying also more into a local context.

Prof. Vella: Role models are frightfully important for the simple reason that the person who has learnt how to do it, who is enthusiastic and dynamic and, in a way, crazy about these ideas about science; that is contagious. When your students come to you in the classroom, they will tell you: ''Prof. Vella, how is it that you can spend 12 hours a day, and you're in your 40s, 50s, or 60s and you seem to know so much?

How did you do it?.'' And they're very, very excited. ''What thrills you? What excites you?''

And it is that seed that you try to plant in some of your students. It doesn't happen in all of them, and it doesn't need to. But it is the excitement of exploration; the excitement of scientific approach; the excitement of being in tune with the world around you; the excitement of saying: ''My God! If this is true, in the next five years, so and so is likely to happen.'' Prediction, forecasting.

So, without these role models if you have a role model of a memoriser, the student says: ''This guy only does it because he's got a fantastic memory; he's a robot. So when studies have been done on excellent teachers and students who recognise these teachers as excellent will ask ''What made this guy or this lady different?'' The first thing that comes out was: interest in what they were doing and, second, knowledge of their subject. And this is natural.

Without interest for it, there isn't the aptitude of spending the time to acquire the knowledge. Sometimes you have the knowledge without the interest and students detect it very quickly. And it puts them off. They say: ''He's not excited about the subject.''

Malcolm: He's been doing it for too long.

Prof. Vella: It's a routine. He's reading the notes, he's talking....

Alex: Are you at all concerned, worried maybe, about Maltese medical and science students because they really have not had these role models for a number of years?

Prof. Vella: There has been a gap over a small number of years recently in which this excitement, of people who have actually done research and dedicate their life to it, may not have been as frequent as it was in the past, but there is a lot of interest in science. Deep down, students all over the world are interested in the world around them, young, naive, idealistic and so on. But that naivetée, that idealism may

become stifled, one by the institution and two by the need to make a living. I found it in Canada, Africa. You can excite students deep down.
Malcolm: And it is a once in a lifetime experience which they have to have and deserve to have because, once they get into the threadmill of having to earn a living, that enthusiasm which they once found evaporates.
Alex: If I can interject on the necessities of having to earn a living. Something has happened in Malta that is very unfortunate and may discourage young, competent students from taking up careers, either in science, as faculty members or even in the health or other professional services where one needs to make a major commitment to an institutional type of practice versus the private sector.

Very unfortunately – because it will destroy this type of institutional practice – there is a great disparity now in Malta which doesn't happen in any of the developed countries, where the income that's possible in private practice or in an institutional type of practice is tremendously different.
Prof. Vella: The private practice is much higher.
Malcolm: The institution cannot match the sort of salaries...
Alex: It's not that they cannot but that they do not right now. I think it is interesting that we come into this argument from this line of thinking. But, if you look at what happens in the developed countries the decision whether to do science or private practice should not be based on levels of income. Which means that, until such a time when our institutions pay competitive compensation, then obviously we have serious liabilities in developing valid and strong programmes in science and academic medicine.

We've talked of that 30 per cent of faculty person that is committed to education and instruction. We've talked a little bit about investigation. We've also talked now about responsibilities connected with

services and finances. The way I have been trained to look at the functions of universities and university departments, especially in science and medicine, is that one third of your effort is dedicated to teaching and instruction at various levels, one third of your effort is dedicated to investigation and research, one third of your effort is dedicated to delivering a public service.

Do you have any ideas about the way the connections between universities and industry have merged a lot in North America? I know these links are very strong in the United States.

Prof. Vella: They were very strong in the United States and there is also a big trend in Britain. The whole idea is really to try to convert book knowledge, laboratory theoretical knowledge into practical application. We've become much, much more conscious of that for the simple reason that basic investigations are very costly. Science is not a cheap activity any more. The man in the street, the politician, says "You've been getting money for the past 25 years, what are the results of all this?

Basically, now, every individual who writes a research thesis is likely to be asked "Have you thought about possible applications of this knowledge?" as part of his examination. So then there is this trend to think of the acquisition of knowledge; the potential application of the knowledge. For the simple reason that potential applications of knowledge are not always self-evident. These things don't happen by themselves. You've got to try to say "Now, from what I have achieved, how could that be put into practice?" And the mind becomes focused into potential application. Channelling of energies...

Alex: I think, increasingly, we need to be able – those of us who commit their major efforts to scientific research – to do two kinds of thinking. One is we need to retain, to stick with the good old principle that you do pursue knowledge for knowledge's sake and that those institutions

or those countries, that have tried to limit that, have paid very dearly in their ability to apply new knowledge. But, I think all of us now also recognise that, in addition to that, while thinking in terms of pure science, we also have lingering thoughts at the back of our minds of ''Now I've learnt how to do this'' and ''now I can do this better, what can I do with it to provide a service?''

There is a different kind of challenge. For instance, we talked earlier about abnormal haemoglobins and thalassaemia. These have been on the leading edge of new technology in molecular biology, genetics, genetic engineering.

Large programmes are being established all over the world now in order to identify those babies that are born with these diseases as soon as they are born, or before they are born. In various ways, you can help them or their families and all this is derived from many years of very basic, very pure research on proteins, genes and methods. We are fortunate in Malta to have the support of the University, the Health Department and the World Health Organisation in developing a comprehensive genetics programme to provide such services.

Malcolm: Once you know that the family has the tendency, you would know what to look out for.

Prof. Vella: More than that actually, with bone marrow transplants, you could almost affect a cure. That is part of the social responsibility, basically, of science.

Alex: It is to distinguish between the possible and the probable, the doable....

Prof. Vella: And also the fact that you have been supported by public money to do these very interesting and exciting things. To live in your ivory tower, to some extent. Now, you owe the people who have supported you.

Malcolm: I think also in North America, though not all, universities are state-funded.

Alex: No, and state funding, even for those that are or used to be exclusively public universities, state funding begins to diminish both as an absolute trend but also in proportional amounts relative to other incomes that universities make.

That is why, I think, that it has become important for universities to go out into the community and offer services for fees. This is true in health care areas, where medical faculties are in fact pushed to provide services.

Prof. Vella: It is very important, Alec, that a balance be maintained. Universities that sell their souls to industry become slaves of industry. Beacause the work they do becomes geared to industry. What we need is creation of knowledge as much as we need application of knowledge. So what we need is a good balance between these two.

Alex: I think that you need to be very strongly defensive of your right responsibilities, and duties. The kind of co-operation that is evolving in many US institutions is not yet the ideal but it is nowhere near the catastrophies that were predicted only a few years ago. One sees today, even in the very leading journals, such as *Nature*, *Science* and *PNAS* (Proceedings of the National Academy of Sciences of the US), joint publications of both scientifically and economically very important discoveries that are co-authored by scientists from a university and a company.

Prof. Vella: It is also true that you see very good scientific papers produced by basic scientists working in industry, financed by industry in industrial research laboratories.

Malcolm: There was one published recently by a Japanese company about some false blood cell. That is quite a positive sign.

Prof. Vella: Yes, using polymers as a substitute.

Alex: Pure, fundamental science is an extremely expensive operation but it has to be done. It is essential for developing countries, especially, to invest in this science. Because this creates the added value. It might not appear now in your year-to-year estimates but it will appear later. Considering the direction society is going I think most of the value added in a [illegible] years' time will come in science and technology.

Prof. Vella: One interesting little point relates a lot to what we have been saying. It is the idea of consumers of science and producers of

science. This is a very, very important idea. Most countries have been consumers, actually; a small number of countries – the United States, Europe, the United Kingdom and Japan – have been producers of science.

Now, I think, in Malta, what is happening is that, since the 1950s or thereabout, a sufficiently large number of Maltese-trained individuals, people with degrees from the University of Malta, who have gone overseas, have now started becoming producers of science.

The University of Malta, to some extent is becoming a small producer of science. Once you have a research nucleus and a number of individuals dedicated to this type of thing, then you can get publication.

Alex: This is what Professor J.V. Bannister calls a critical mass. One person won't do. But if you have five or six, especially if they are young.

Prof. Vella: Because they support each other, you see, emotionally, scientifically, personally.

Malcolm: People to knock ideas off – a sort of synergy is developed between them.

Prof. Vella: Production of science is usually seen in publication, scientific peer-reviewed publication, and that is really an important measure. Today, I think, it is fair to say that, in terms of population size, the number of Maltese scientists living overseas and working overseas and living in Malta and publishing from Malta has increased substantially. It is a reasonable number.

Alex: I don't know how it compares versus per head of population. There is a substantial number.

Prof. Vella: If you had to say what is the Jewish contribution to humanity, to human science, it is very large. Where was it made? Was it made in Israel?

Malcolm: No.

Prof. Vella: It wasn't made in Israel. It was made by Jews in Britain,

in Europe (Eistein) and the United States. What was the Greek contribution to science? We see a large number of Greek names in publications today. Not many of them are working in Greece. Many of them are overseas. That is their contribution.

Malcolm: Now, I would like to turn to you, Professor Felice. Can you tell me a little about yourself?

Alex: Like Professor Vella, I graduated MD in 1971 from the University of Malta and then I did my residency at St. Luke's Hospital during which time I got introduced through Joe Louis Grech to the beautiful world of abnormal haemoglobins. So, when most of my friends and colleagues were suturing patients in the Emergency wards, I was looking at abnormal haemoglobins in the Clinical Lab at St. Luke's.

After three years at St. Luke's, I came back to the University on a fellowship to do graduate work and, at the time, Marie Therese Podestà (*née* Camilleri) and I were the first to do a new Masters degree programme to develop medical research in the University. The research was done in collaboration with a group in the Medical College of Georgia in Augusta and, when I finished my studies in Malta, then I went over to Augusta to train with Titus Huisman in 1976.

I continued my studies on abnormal haemoglobins and thalassemiaa in Augusta. Eventually, I went for a PhD degree over there. Initially the idea, like many Maltese doctors, was to go overseas for a few years to get a further education and training, and then you come back.

For various reasons, partly because I was doing scientifically and professionally very well in Augusta – within a couple of years I had my own laboratory, then I had my own grants, then I was on the Faculty of the Medical College of Georgia and we were publishing regularly. So, things were going...

It was all very thrilling and exciting to be living, especially in those

times. The late 70s, were very exciting times with haemoglobin. These were the times when we began to have available in our hands pieces of the gene, that we could manipulate, that we could use for testing, especially, and this is how a whole new field of molecular diagnostics developed, starting with haemoglobin and the ability to take a few teaspoonsful of a patient's blood and isolate his own DNA, which is his actual genetic material, manipulated in a laboratory and tested with different probes.

Prof. Vella: I think, analysing would be more accurate – sort out the details of what kind of gene it is; what kind of problem it will give rise to so that one can take decisions as to what kind of care these patients may need.

Malcolm: When you see a gene and open it up and you can predict what's going to happen.

Alex: You can say this one-day-old baby has a very severe type of thalassemiaa and is not likely to survive more than 15 years. Therefore, if I have a potential treatment which is even then potentially dangerous, such as a bone marrow transplantation, then I am liable to offer it to him or to her. But, in another one-day-old baby on whom we might have done some of these DNA-type of testing, then we might discover that the baby has a mild type of thalassemiaa. It might need an occasional blood transfusion. Then, we might not offer that baby a dangerous type of treatment. These are the sort of decisions one makes in genetics.

Prof. Vella: There is also the aspect of trying to describe the type of quality of life that that individual with those risks may have. What they may expect.

Alex: In this connection, there's a kind of information that molecular genetics gives us that may, through counselling, for instance, help the person lead a nearly normal life. For instance, there are persons that have a certain protein missing in their blood, called alpha-1-antitrypsin,

which protects the lungs and the connective tissues from various kinds of damages and, if these people smoked, then they would be more susceptible to damage to their lungs than anybody else. There are such simple steps that one can take: if you have this kind of deficiency, don't smoke.

Phenylketonuria is another disease that can be treated by avoiding certain substances in the diet. If they adhere to these diets very strictly, then they do very well, or reasonably well. So, these were the times, the late 70s and early 80s, that were very exciting.

There were difficulties also, of course, in coming back to the University of Malta, at the time, so we stayed in Augusta. As we used to tell our friends later on, "We went to Augusta for one year, maybe two. That was ten or 12 years ago."

Malcolm: What can you say that you achieved in those 12 years in Georgia? What was the most important thing that you feel that you achieved?

Alex: There are two answers to that question. One is a personal sense of achievement of having done certain things that have contributed to science. The fact of having discovered a certain type of thalassemiaa for the first time. That gives you a certain high, thrill, that's some ego building! My group did it and not somebody else. Or that it was done in my institution and not elsewhere, because there's competition.

The fact that you have described something important which is new, that was published; you've talked about it at meetings and conferences, also sustains your effort to get more funds for your own programmes. In fact, very often, that is what granting agencies want to see. That is what you are asked: "What have you done, what have you published with the money that we gave you before?"

If you haven't published anything, maybe you will get a nice handshake but you won't get a penny to continue supporting your operation. And it is highly competitive.

Secondly, I think it is an exposure to a very efficient and effective way of managing research and development programmes. That's what comes under the title of training and experience. Unfortunately, in Malta, we have not in the past given enough of the necessary importance to the idea of training. I think we have been strong on education, especially undergraduate education. Our Bachelor's level programmes were competitive. We were very seriously deficient in anything above that but I think....

Malcolm: But then, there were opportunities to go abroad and further training abroad so, perhaps, that gap was more or less catered for. The Rhodes Scholarship....

Alex: I'm not sure it was completely filled. You need to have certain areas, niches of expertise, if you want. Because then you create role models and then you create opportunities for training, education and for research. Then, you begin to appreciate competition in your way of thinking.

Malcolm: What is your role now at the University?

Alex: Well, I don't want to say too much about the department, but one of my goals... I returned to the University of Malta with two or three specific goals.

Malcolm: When did you return – give us a date.

Alex: I returned in September, 1988, with a wife and two children to the Department of Biomedical Sciences with responsibilities in biochemistry and molecular biology.

Malcolm: And your three goals?

Alex: I want to develop a comprehensive genetics programme using state-of-the-art molecular genetics techniques to provide services for education, training and research; to set up an effective education programme in molecular biology, especially something the Dean mentioned in his oration – the development of a clinician scientist programme; and, thirdly, I have interests in blood biotechnologies because of my background in haemoglobin and blood molecular biology.

Notes needed: Prof. Vella's publications and memberships.