Tyndall in the year of his retirement, talking on the wireless.

(The West of England Home Service programme, Monday 5th July 1948, 6.35 p.m.)

Fifty years ago next October, I enrolled as a student in University College, Bristol, which 11 years later was merged in the University of Bristol. It is from Colleges of this character that a number of Universities in this country have arisen. The College then was a very different place from the University of today. I was one of 220 students, a figure which has since been multiplied ten-fold. The whole of the College was then housed in one of the numerous blocks of buildings which have since arisen. By modern standards the supply of apparatus for teaching was meagre in the extreme. There was no Athletic Ground, and no Union to help our social life.

There were then only 23 full-time professors and lecturers of the College. So when I joined the staff a few years later, we could all meet socially in a fairly small Clifton drawing-room, despite the fact that the Victorian furniture and bric-a-bac in it would nowadays seem to fill the room without us. Today these numbers are also multiplied more than ten-fold, and there has been an even greater proportionate increase in maintenance and laboratory staff.

Yet the academic staff of those days was quite a distinguished one. Amongst them was Professor Lloyd Morgan, a psychologist and philosopher of international reputation who had succeeded the celebrated chemist, William Ramsay, as Principal. Some years ago, I sat next to General Smuts at a luncheon party in Cape Town; he talked about Lloyd Morgan for quite a long time and spoke of him as a friend and one whose philosophical views had greatly influenced him.

But of all the staff of my student days, I must give first place to a remarkable man, Arthur Chattock, Professor of Physics. He was not only an inspiring and unselfish teacher, but also a scientific investigator in the first rank. He was the inventor of a gauge for the study of aeroplane design which was subsequently used in laboratories all over the world. He was also a pioneer in other fields. With a little more luck he might have been a name in radio history. Oliver Lodge once told me of a suggestion that Chattock had made to him in connection with an electrical experiment they were carrying out together. Chattock had urged Lodge to use the experiment to look for electric waves. But Lodge never did; if he had, they would probably have discovered the waves now being used to transmit this programme before any one else did.

A University science laboratory is a hive of industry just as much in vacations as in term time. The reason is that the function of a University is not only to teach, but to extend the frontiers of knowledge by what we now call 'research'. Indeed, what else are vacations for? Nowadays large sums of money are spent annually on research, and, in my department alone, there are about 80 physicists spending most of their time on it.

But in the early days this was not the case. The academic staff had then only a mere handful of graduates to collaborate with them. I can remember one, Dr Millicent Taylor then, a school-teacher from Cheltenham, who, every Friday afternoon in school terms, cycled from Cheltenham to Bristol and back again on Monday so that she might use the laboratories and consult her Professor over the week-end. She says that she was then the

fastest and, for miles, sometimes the only vehicle on the road; annoyed when the first motor car came to pass her on the level, delighted when she pedalled past it going uphill.

Both the earlier College and the University have been indebted to a number of benefactors. When I entered the College, it was in an impecunious state from which it was only beginning to emerge. Sometimes the payment of academic salaries was in jeopardy for the want of - say - a thousand pounds. In those days it was members of the well-known Bristol family of Fry who watched over the interests of the College so zealously.

The magnanimity of the Wills family came later. It was a gift of £100,000 from Henry Overton Wills in 1908 that really transformed the situation. I was present at the dinner of the University Colston Society at which this was announced. It was a dramatic occasion, decisive in its results; it led the Privy Council to grant to Bristol a University charter. It was also the first of a series of important gifts from members of his family.

But it was not everyone who welcomed the change from College to University. To some it seemed like the merging of an old-established family business into a multiple store. It was feared that the intimacy and friendly atmosphere of a small community would disappear, and that the College known as a centre for cultural studies would become instead just an organised factory for University degrees. But to us younger members, these fears were groundless. We revelled in the larger life of a University and particularly the freedom to teach on our own lines.

It was within the period between the wars that the pattern of future development was really made clear. With the aid of further gifts from the sons of the founder, George and Harry Wills, new buildings were erected on a hill overlooking the ancient parts of the city and and extensive sites secured for future halls of residence within easy access of open country. The plan was to establish in course of time a new residential University. For this Bristol has many advantages. Indeed, the absence of a highly industrialised area beyond the city boundaries is in itself an advantage because it means that students coming from other parts of the country are not swamped by those living at home. That every student should spend at least one year of his University life in a hall of residence still remains our policy, to be resumed as soon as building facilities are restored.

At the same time, none of us between the wars foresaw the great expansion which has followed the late war, with numbers doubled in every phase of University activity. When Sir Philip Morris arrived as Vice-Chancellor in succession to Dr. Loveday, this situation had already started to develop and the University has been fortunate in having a man of such initiative, drive and ability to direct the stream. There was a period before his arrival when the office was vacant for nearly a year, and I acted as Vice-Chancellor. Though conscious of my own short-comings in a post of this character, I find myself looking back on this period with some satisfaction. We prepared some of the ground for the great expansion in medical teaching and research which is now beginning, and for the coordination of its more highly specialised branches throughout the whole of the West of England. We also initiated plans for new departments, two of which I had always hoped to see encouraged within the University - Music and Drama. When the B.B.C. Symphony Orchestra was in Bristol in 1939-40, I was struck by the number of science undergraduates attending the weekly lunch-hour concerts - I would hazard a guess considerably more than students of the humanities. At an exhibition of paintings the reverse would have been true, and, at the theatre - say - honours were easy. Here then were interests worth cultivating to the full, in which students of all faculties would be drawn together. The specialist in Drama was appointed before I

handed over, and a Chair of Music filled shortly afterwards.

As was the case when the College expanded into a University, there are some who feel that we have lost something by this large post-war expansion. Of course this is true. Most departments are too big now for a Professor himself to know every student intimately. Departmental organisation of a large research and teaching programme absorbs so much more time. Government Committees demand our services. But it is useless to deplore the fact that things are not what they used to be. The administrative machinery must be adapted to meet them.

The Henry Herbert Wills Physics Laboratory, of which I am the Director, arose from a somewhat accidental contact I had with Harry Wills over 30 years ago. The laboratory resulted from a gift from him of £200,000; this was followed by endowment funds from his brother Melville, and from the Rockefeller Foundation of New York. More recently large grants from industrial and government sources as well as from the Nuffield Trust have been added. The result is that we have been able to collect together a large group of younger physicists from all parts of the world who, by their work, have given the laboratory a high reputation.

But all this dates from a day when Harry Wills and I met to look at a room which I had suggested for housing a battery of accumulators. The room was not big enough. So we inspected alternative sites, with Mr Wills gradually becoming more and more interested in the provision of adequate facilities for my subject, physics. The battery became quite a secondary matter. The first alternative, giving space for a hut, was turned down because it would destroy the only patch of green grass then existing within the precincts of the University buildings. The second suggestion, the provision of a third floor to an existing building, suffered the same fate because of the cost of strengthening foundations. A third, because it would destroy the only grove of trees in the neighbourhood of the University. Finally, with each plan bigger than the one before, the sixth and last site was selected, and a great building arose.

Looking back on my experience as Director of this laboratory, and as a member of the University Senate, I am convinced that the strength of a University lies in its young men and women in the active and most fertile years of their lives. In the field of science in particular, in which the frontiers of knowledge are continually advancing, age and experience count for less than initiative and an original and flexible mind. Though on retirement I can claim to have played no small part in a big enterprise, I am not like Ibsen's Master Builder, fearful of the ability of Youth knocking at the door. I hand over assured that, in their hands, even greater things will be achieved.