

Student Memories of Bristol

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My first contact with the University was the most decisive of my life. It occurred when I was a reluctant schoolboy. My ambitions for an academic career were negligible. I wanted to leave school to enter the radio business and play cricket. Then for the sake of the evening outings I joined a small group being taken by the physics master to a series of public lectures on 'The electric spark'. They were given by Professor A. M. Tyndall in the lecture theatre of the H. H. Wills Physical Laboratory in the University. Later in life I learnt that these were a repetition of the children's Christmas lectures which Tyndall had given at the Royal Institution. At that moment I was 15 years old, living with my parents in the countryside, cycling every day 2 miles to the school recently opened and then known as the Kingswood Secondary School. Tyndall opened a new world of which I had no previous acquaintance. The environment, the demonstrations and the apparatus filled me with awe. Now, nearly half a century later, I can see those great sparks ripping across the lecture room, infra-red rays being focussed by a mirror, the effect of ultra-violet light on natural and false teeth, and the laboratory steward, Venn, operating a massive slide projector and epidiascope with a hissing carbon arc as the light source. In a few minutes Tyndall and the lecture room had changed my life. The way home was by electric tram to Kingswood and then a 3-mile walk. I must have done that journey many times, but that first night of Tyndall's lectures is the one I remember. For the first time I looked at the stars and wondered what they were.

Only one thing mattered then — to become a student in Tyndall's laboratory. I moved quickly from the bottom to the top of the class, into the sixth form and then in the autumn of 1931, a few weeks after my eighteenth birthday, I became a first year undergraduate, taking physics as the main honours subject with pure and applied mathematics as subsidiaries. This was the normal three year honours course, with the two mathematics subsidiary subjects taken for the first two years and then physics only in the third year.

It was a splendid environment, with the Mathematics Department occupying the top floor of the building. The laboratory had been opened only a few years previously and with only 6 of us in the honours school there was room to spare. Then it would have been hard to imagine the extensions to the building and the crowded lecture rooms of the post-war era. By modern standards too we received much individual attention from the staff, who invited us to their homes and for walks on Sundays. I well remember playing table tennis with Tyndall in his home and the extra-curricular associations with the other members of the staff — notably S. H. Piper, H. W. B. Skinner, C. F. Powell, W. Sucksmith, H. H. Potter and L. C. Jackson. In addition to the staff there was a remarkable collection of distinguished research fellows working in the laboratory, for example, R. W. Gurney, W. Heitler, C. Zener, H. Jones and V. E. Cosslett. The Professor of Theoretical Physics was Lennard Jones, who was succeeded by N. F. Mott between my second and third year. The transference from the classical approach of Lennard Jones to the modern wave mechanical and quantum outlook of Mott was staggering to a student beginning his third year. These years were the ones of the great discoveries in nuclear physics. It was quite usual for Skinner or Gurney to come to the lecture room carrying the issue of *Nature* which had arrived that morning and introduce us to

something entirely new - such as the discovery of artificial radioactivity!

Even in those days the laboratory must have been remarkable for the diversity of its research activities — ionic mobility (Tyndall and Powell), crystallography (Piper), x-ray spectra (Skinner), gyromagnetism (Sucksmith and Potter) and low temperature studies (Jackson). Sucksmith's apparatus was so sensitive that he could use it only in the tunnel which then connected the laboratory to the other building in the grounds of the Royal Fort (Education), and then only in the early morning hours when the electric trams had stopped. Jackson's liquid helium producing equipment was also underground — at the end of the building where the post-war extensions were built - presumably because the techniques then used were new and somewhat dangerous.

On the whole I think we were hard working students. My own life was simple and straightforward. I would walk the two miles from my home to the local railway station to catch the 8 am train which ran on the old Midland line to St Philip's station (now disused I think) at the end of Old Market Street, then another walk through the back streets to the Royal Fort, in time for the 9 am lecture. Of course all this district has been changed completely. During a recent visit I could no longer recognise these streets or the familiar landmarks. The day usually began with one or two mathematics lectures from Vint or Fraser, followed by physics lectures later in the morning and practical laboratory classes in the afternoon. I would then return home by the same route and work into the night. The whole atmosphere of the laboratory was so dramatic that I dreaded the vacations and eventually arranged with Piper and Potter to work in the laboratory during the vacations on some minor pieces of research which they gave me. I had two passions apart from the work - music and cricket. Occasionally I would go to the Colston Hall to hear a piano recital. I still have the score of the Beethoven Opus 109 sonata with which I followed Schnabel from the gallery, and Horowitz, as a young man, playing Liszt's *Les Funérailles* was an experience never to be dimmed by the years. Also I went fairly regularly to the concerts of the Bristol Choral Society and the Bristol Philharmonic Society, and to the University Chamber Music concerts held in the Victoria Rooms. As for cricket - well I now find it extraordinary that my attachment to work was so great that I turned down the pleas of the University captain to play at Coombe Dingle on the grounds that it would be too much distraction.

I cannot recall any doubt, either on my part or Tyndall's, that I would remain in the laboratory for research after graduation. Tyndall obtained a DSIR grant for me (SRC took over the responsibility for maintenance grants from DSIR in 1965). At that time the value of the grant was £120 per annum — but it was enough for me to buy a two-seater Morris open coupé (I believe the price of these cars was then about £100) — of course I was still living with my generous parents! So in the autumn of 1934 I settled down to research under the guidance of E. T. S. Appleyard as my supervisor. I set up apparatus on the ground floor of the physics department — the last room on the left of the corridor where the new post-war buildings were destined to join. The room was still identifiable when I last visited the department (1975). A young refugee from Germany (L. Frank) worked at one end and my high vacuum equipment for the study of the electrical conductivity of thin metallic films monopolised the other half. This equipment in pyrex glass depended on the great skill of the glassblower (J. H. Burrow). He became a valued friend (and was appointed to the lecturing staff after the war). Since nearly every person depended on the glassblower, Burrow was the effective dictator of the researches — but he was immensely skilful and his equipment enabled me to work in high vacua which would be considered good even by the standards of today.

I settled down, too, to enjoy the pleasures of life in Bristol and the University which I had so strongly denied myself during the undergraduate years. During the summer I played cricket for the University team. In the spring of 1975 when making a film for the BBC, I went to Coombe Dingle again and was delighted to find it almost unchanged after 40 years. Jack Bezzant, the professional, had retired, but the ground, the pavilion, and the beautiful surroundings were as I remembered them. J. Vint, the mathematics lecturer, also played for the team. He was a very good bowler, and played regularly except in the inter-University matches. In the vacations I played for the Bristol Optimists and for my local village (Wick) and in the winter I played tennis at Coombe Dingle on the hard courts.

The University Union was in the Victoria Rooms. Sometimes we had dances in the large hall and often they took place in 'Brights' (next to the Museum). I do not know if it still exists. In the 30s it was a favourite place for morning coffee and the elegant dances — full dress of course: white tie and tails (and white gloves). I do not remember seeing many men wearing dinner jackets at these Union dances — that would have been bad form. The fact that my apparatus demanded liquid nitrogen replacement every 12 hours was too bad for my partners — they had to be taken home via the Royal Fort even though it was 2 am. As well as cricket and this social life there was time for music. On Monday nights I journeyed to Bath where Raymond Jones (who was later Assistant Organist at Bath Abbey — he retired in 1975) was my teacher, and at lunch time I would take my sandwiches to a church on the other side of the Suspension Bridge for daily practice. Even on £120 a year it was a pleasant and full life. The rumblings from Europe seemed far away. The Spanish Civil War, Hitler, Mussolini and Abyssinia were all erupting during those years. One Saturday night I walked out of the laboratory with the refugee Frank, to be faced with placards 'Hitler marches into the Rhineland'. I well remember his rage that nothing had been done to stop this.

The University and Bristol were pleasant places in those years. The river and the ships came right up to the tramway centre and it seemed to a young man that nothing could disturb the agreeable equilibrium of life. But long before the fire bombs destroyed the Great Hall my own equilibrium was shattered. My researches had gone well, the work had been published by the Royal Society —but my DSIR grant was only for 2 years. Tyndall awarded me a Colston Research Fellowship but, in his wisdom, he said I ought to leave Bristol so that I could get more competition than existed in his laboratory! I did so in the autumn of 1936 dismayed beyond consolation and filled with a nostalgia which returns even now whenever I see the University tower rising above Park Street - as it first did when I was a twelve-year-old.