

POSTSCRIPT

J. S. Anderson and His Move to Aberystwyth

Background

From early to mid 1971 I got to know J.S.A. rather well. I had been invited (by Peter Day) to present a departmental seminar at the Inorganic Chemistry Laboratory, Oxford, in late 1970 based on the work that I had described in *Endeavour* (1970) entitled "The Chemistry of Deformed and Imperfect Crystals." At the lunch (in St. John's College) that day we had sat next to one another and had got on famously in delving into chemical and other reminiscences. After my talk, which, *inter alia*, described some novel applications of optical and electron microscopy for the detection and quantitative determination of various kinds of structural defects (point and line) in solids (particularly graphite and molybdenite), our scientific friendship immediately deepened.

Thereafter, I was called upon regularly to serve as D.Phil. examiner for his students; and whenever I visited Oxford (e.g., to lecture at the Physical Chemistry Laboratory or at the Department of Metallurgy and Materials Science, or to serve as examiner for other students) we would invariably spend a few hours together in his room and laboratory at the ICL. Brian Smith also brought us together a number of times at St. Catherine's College.

My work at Aberystwyth on X-ray and UV photoelectron spectroscopy, as well as our use of electron microscopy to monitor organic photochemical changes in molecular crystals, and the intercalation of graphite and the transition-metal chalcogenides, appealed to him. And when he visited us at the Edward Davies Chemical Laboratories (EDCL) in Aberystwyth in 1973 and 1974 he obviously showed great enthusiasm for our work.

At that time Miguel Alario Franco (now Dean of Science at Complutense University, Madrid) was working with me, and J.S.A. was struck by the beautiful series of shear structures—bearing striking resemblance to what he and Bruce Hyde had described in TiO_x systems—that we had uncovered (electron microscopically) in the decomposition and reduction of CrOOH .

David Jefferson (now of Cambridge) had also joined me at Aberystwyth by that time, and we had already shown that high-resolution electron microscopy (HREM) could tell us a great deal about the structures of sheet silicates (like stilpnomelane, zussmanite, and the serpentines), as well as of pyroxenoids like wallastonite and pseudowallastonite. All this appealed greatly to J.S.A., as did J. O. Williams' work on the photophysical properties of organic luminescent materials and M. J. Tricker's work on conversion-electron Mössbauer spectroscopy for the study of surface changes in iron-containing solids (especially minerals).

Toward the end of 1974 he raised the question with me of whether there would be room for him (and, as he put it, "my small group") to pursue research at EDCL after he retired from the Oxford Chair of Inorganic Chemistry. My response

was emphatic. I told him that he would be more than welcomed even if it meant his simply being given an office to write up his work and to contribute to our general surge of activity in solid-state chemistry. He was quite adamant, however. He wanted to do *real* research.

He wrote me a long letter in which he systematically explored his options. His final lengthy paragraph concluded that the EDCL was the most attractive option for him. But he wanted to bring John L. Hutchison (his P.D.R.A. at the ICL) and their Siemens 102 electron microscope with him. The powers that be at Aberystwyth were most understanding. I was given some extra funds by the Principal (Sir Goronwy Daniel) and the Registrar (T. A. Owen) to extend our basement so as to cater for a third electron microscope—we had two operational there already—and an extra dark room. The SRC (as it then was), especially the Chairman of the Science Board, R. Mason (now Sir Ronald Mason F.R.S.), argued that, since J.S.A. was quite exceptional in his work on the electron microscopy of nonstoichiometric oxides, the case that I, as head of Department at Aberystwyth and applicant to the Chemistry Committee, was to submit stood a good chance of success even though J.S.A. would be regarded as postnormal retirement age on taking up his tenure in Wales.

In due course, J.S.A. and J.L.H. (J. L. Hutchison) arrived. J.S.A. threw himself wholeheartedly into the life of the Department. The M.Sc. (taught) course in solid-state chemistry, which I had set up in 1971 with backing (and several Advanced Studentships) from SRC, benefited considerably from J.S.A.'s contributions to the "core" lecture course. His conversations and constructive criticisms in the Departmental tea room also served to keep us all on our toes, and he frequently regaled us with tales about his life in Australia.

J.S.A. spoke in complete paragraphs. I remember, one day, during a coffee break, asking him to explain the subtleties of the Kondo Effect. He sucked at his pipe for a somewhat longer period than usual; the concentration in his eyes intensified; then after a few rapid emissions of smoke, he proceeded to hold forth in a beautifully lucid manner.

As soon as his equipment (the Siemens 102 microscope) was operational, it was arranged for J.S.A. to have one or two of our M.Sc. students and one exceptionally gifted Ph.D. student—Miss Sian Crawford, who had obtained a starred first in June 1975—to be assigned to him. The partnership which J.S.A. and Sian built up was a joy to behold. Some 46 years separated them in age, but they interacted wonderfully. She, like John Hutchison and Pratibha Gai (now of the Dupont Company, Wilmington), worked alongside J.S.A. in a most effective manner. Sian's work served as the foundation on which J.S.A.'s Nobel Institute Lecture (in 1978–1979) was based: it uncovered in unparalleled and thrilling detail the local structural order of the seemingly fiendishly complicated nonstoichiometric phases of Nb_2O_5 .

J.S.A. was instrumental in telling us, well ahead of the journals, what was going on in J. G. Allpress and J. V. Sanders' laboratories, and of Alex Moodie's, Peter Goodman's, and Mike Keefe's computations in Australia. When David Jefferson, Bob Millward, and I produced the multislice program of computing images (largely through Jefferson's efforts) recorded electron microscopically, we placed ourselves ahead of all other electron microscopy (solid-state science) laboratories in

Europe. This excited J.S.A., for, at that time, he ran into much aggressive—and, as it later transpired—ill-founded criticisms by the physics community about the trustworthiness of imaging the ultrastructure of nonstoichiometric and other solids via the technique of direct imaging (by HREM).

I recall several one-day, solid-state symposia we organized at Aberystwyth (attended by experts such as Archie Howie of the Cavendish, Alex Moodie (Melbourne), C. N. R. Rao (Bangalore), Trevor Evans (Reading), Charles Taylor (Cardiff), and A. R. Ubbelohde (London)). These were of great value to my team of researchers who all looked up to J.S.A. both as a senior-senator and as father confessor and also as a prodigiously hard worker. Twelve-hour weekdays were his norm, and he seldom left the laboratory before mid-afternoon on Saturdays.

Patibha Gai came and spent a month with us to pursue her electron microscopy. C. N. R. Rao, with whom I had established separate links, arranged to pay us a few extended visits and J.S.A.'s former Australian students, Judge Bevan and Frank Lincoln, also called to see us, each bringing fresh impetus and adding to the extra joy of international collaboration.

Everything proceeded with great success and there was general, all-round satisfaction which never lapsed into complacency—J.S.A. did not know the meaning of that word, for his policy was to stretch himself both physically and mentally to the limit. J.S.A. had managed to purchase (on auction) an old small-holding in the little village of Abermagwr, a few miles inland from Aberystwyth. He and Joan frequently invited me and my wife to have dinner with them on a Saturday night, just as he and Joan frequently came to our home in Rhydyfelin, 5 miles or so away. He befriended some of his neighbors, especially the Headmaster of the Bilingual School (Dr. Gerald Morgan, an Oxford graduate in English) at Abermagwr, and he gained the admiration and respect of the academic community. Professor and Mrs. Mansel Davies and the Anderson family grew particularly close. They shared many friends and contacts in Australia, especially A. L. G. Rees, one of the doyens of solid-state chemistry.

In May 1977 a special dinner was organized by the EDCL to celebrate my election as F.R.S. in March of that year. J. O. Williams (later Head of Chemistry at UMIST and now Executive Principal at the North East Wales Institute, Clwyd) was the driving force behind the event, at which Mansel Davies and J.S.A. spoke. It was a memorable occasion. But I had mixed feelings that evening, for I had earlier that week been told that I was likely to receive an invitation to become Jack Linnett's successor as Head of Physical Chemistry at Cambridge. Whilst I felt honored by this news, it also unsettled me. My family lived an idyllically happy (and bilingual) life in Aberystwyth, where I was able to pursue world-class work at the University of Wales (with its marvelous network of contacts throughout the Principality) and live the life of a Welsh country boy, with great opportunities to pursue my interests in bird watching, hill walking, and Welsh literature. If I were to move to Cambridge, where there are no red kites and few buzzards, all this would dissolve. Moreover, my lively team of solid-state chemists would no longer be unified in the harmonious way it was at that time. To add to all this, there was J.S.A. and his commitment to Aberystwyth, where he was very happy and successful.

With a somewhat heavy heart, and much hesitation, I mentioned the invitation

from Cambridge to J.S.A.. He gave me unequivocal advice. He said that there was no question but that I should accept. Cambridge would give me even greater satisfaction and, so he said, I could provide physical chemistry at Cambridge with added stimulus. He also told me that Jack W. Linnett (who had been a member of J.S.A.'s staff at the ICL in Oxford) had, in 1972–1973, planned to recruit me as his (J.W.L.'s) second professor at Cambridge, but that, owing to some financial difficulty, this plan had been frustrated.

In due course I left. But I kept my links with J.S.A.: we wrote to one another regularly. He came to see us in Cambridge on a number of occasions; and there was one very happy Tuesday in 1980 when J.S.A. gave us a Departmental Seminar in Physical Chemistry at Lensfield Road (Cambridge) on "Non-stoichiometry Re-visited." This seminar was attended by Harry G. Emeleus. At the dinner that night (in Churchill College) we heard J.S.A. and H.G.E. reminisce about the writing of their famous book: *Modern Aspects of Inorganic Chemistry*. It was an evocative evening.

Final Days at Aberystwyth

My place at Aberystwyth (EDCL) was taken by Dr. Jeremy Jones, Fellow of Trinity College, Cambridge (and a distinguished member of staff in Physical Chemistry at Lensfield Road when I got there in 1978). He set about building a dynamic and powerful laser-chemistry group at EDCL. Dr. J. O. Williams, by then a Reader in Chemistry, continued his work in solid-state chemistry and interacted profitably with Professor Jeremy Jones. The EDCL continued to excel as a research center with others (Professors H. G. Heller and G. Williams) there doing notable work (in photochromics and polymers, respectively). Professor Mansel Davies, a phenomenally productive individual, had already retired to live in Criccieth. Dark clouds began to gather, however, in 1981–1982, as the Government's (and the UGC's) attitude to small departments began to harden.

Undergraduate numbers in the Department of Chemistry at Aberystwyth have never been large. But they now began to grow smaller, as two sister departments (Geography and Botany) mounted courses in Environmental Science, which caused the service teaching element of the Department of Chemistry to drop to quite low levels. Pressure for the closure of the EDCL started to grow within the College. J.S.A. sensed all this. In addition J. O. Williams was appointed to the Chair in UMIST; and Mansel Davies, with whom he had many stimulating and enjoyable interactions, had gone. J.S.A. decided that the time had come for another move.

JOHN MEURIG THOMAS
*Royal Institution
21, Albemarle St.
London W1X 4BS
United Kingdom*