

Obituaries

IRENE MANTON
(1904–1988)

Professor Irene Manton, born at the turn of the century and who died on 31 May 1988, was one of the most remarkable botanists of our time. As a girl she was originally destined to be a musician but, by her own account, public appearances as solo violinist at school concerts were traumatic experiences. Although she abandoned the idea of music as a career, she remained an accomplished performer throughout her life and often relaxed by playing in a quartet. In her latter years at school she became a convert to science after reading Newton's Laws of Motion, which struck her forcibly by their elegant simplicity. Her interests were specifically channelled towards cytology by reading E. B. Wilson's book on *The Cell* (1902), but having won a scholarship to Cambridge she was disappointed to find that her undergraduate years there (1923–26) did nothing towards realising her ambition of studying chromosomes. However, the award by her College of a postgraduate studentship of £150 per annum enabled her to travel to Stockholm to work in Prof. Rosenberg's laboratory (and incidentally to become fluent in Swedish in a very short time!). At this period the study of chromosomes involved the lengthy and tedious process of embedding, sectioning and staining root tips. This formed the basis of her doctoral thesis, involving a study of 250 species of Cruciferae. Her external examiner pointed out a discrepancy between the text and drawings which was to have an important effect later on, namely that watercress was described as having $2n = 32$ but figured with $2n = 48$. Fresh material was hastily gathered and processed to determine how the discrepancy arose and this proved to have $2n = 64$! This was her introduction to a wild polyploid series and their sterile hybrid. It was also a portent in that thereby she added a new species to the flora by discovering its chromosomes first – a pattern that was to be repeated many times by herself and her students in various parts of the world.

Irene Manton went to the University of Manchester in 1929 as an assistant lecturer on the staff of Prof. W. H. Lang, co-author with R. Kidston of the famous series of papers on the Rhynie fossils. At this time Lang was interested in the mechanism of aposporously produced plants of the Royal Fern, *Osmunda regalis*, and asked her to look at them cytologically. From this work arose the classic papers on chromosome structure, together with the autopolyploid series of diploid, triploid and tetraploid plants which provided such excellent teaching material for future generations of cytologists.

During a short visit to Egypt, Dr J. Philp at the Cotton Research Institute showed her some slides of meiotic cells prepared by McClintock's method. This consisted of staining in aceto-carmin and placing a coverslip on top – the weight of the coverslip slightly flattening the soft cells. She took up this new technique with enthusiasm and greatly improved it by applying heavy manual pressure to the coverslip. This produced perfectly flat cells in which all the chromosomes could be seen in one plane and made possible the accurate counting of the high numbers found in the ferns – something that had defeated previous cytologists.

World War II brought restrictions on printing and Irene Manton had accumulated at Manchester such a wealth of material on the entire British fern flora that to publish it piecemeal when restrictions were lifted would have taken an unacceptable length of time and the decision was taken to incorporate it all in book form. In the meantime she had been appointed to the Chair of Botany at Leeds in 1946. Here, her incredible energy not only enabled her to run and re-equip the Department (delegation was not in vogue in those days!), but also rapidly to build up a very flourishing research school, and take on a full teaching load. Nevertheless at the end of each day she would settle down to do up to nine hours research. Weekends were an added bonus only interrupted by the necessity of a few hours sleep and snatched meals. One outcome of all this workload was the streamlining of the mechanics of research by using photographic methods wherever possible in order to eliminate much of the traditional drawing. This was of critical importance and set new standards, since she adopted as her maxim 'what cannot be photographed cannot be used in evidence'.

The book, *Problems of cytology and evolution in the Pteridophyta*, was published in 1950 and proved to be a landmark of much wider importance than its title might suggest. Not only were many problems in the British fern flora resolved, but it effectively disposed of the view held by many European flowering plant cytologists that polyploidy was a direct outcome of the cold experienced during the Ice Age. This was reinforced by the joint publication with W. A. Sledge in 1954 of the cytological survey of the ferns of Ceylon which showed an even higher percentage of polyploidy in this tropical island. The advent of the book stimulated research all over the world with the result that the ferns are now one of the best known groups of plants cytologically, despite the late start.

The frontispiece of the book depicts a fern spermatozoid as seen under the ultra-violet microscope at a magnification of $\times 3000$. In this some of the cilia can be seen to have disintegrated into their fibrillar components and the observation led to the next great phase of her research which was to occupy Irene Manton for the rest of her life, namely the fine structure of cells and their components. Following what was literally a flying visit to the Rockefeller Institute in New York to work with an electron microscope, she soon established at Leeds the first electron microscope laboratory in the world devoted to the fine structure of plants. Initially work was concentrated on the structure of cilia in motile plant cells such as spermatozoids and zoospores. The structure of two central strands surrounded by nine outer ones was demonstrated to be common to all groups of plants with such motile cells. The quality of the photographic proof and the manner of presentation were, as always, of the highest standard and I well remember the whole audience giving her a standing ovation after her lecture at the International Botanical Congress in Paris in 1954. This work continued with investigations into other organelles such as plastids, vacuoles, and Golgi apparatus and much of what is now student textbook knowledge dates from this work.

The algae had always been a great interest of hers and much of the early scanning electron microscopy was based on these plants, some of it done in collaboration with Mary Parkes at the Marine Laboratory, Plymouth. The remarkable scale structures seen in the Chrysophyceae linked up with another of her passions, and the walls of Botany House were covered with SEM micrographs alternating with prints of modern abstract art without one feeling any sense of incongruity. During her time at Leeds, Irene Manton amassed a large and valuable collection of Chinese and modern abstract art – both prints and originals – and she delighted in staging exhibitions of these, the last one being at Lancaster University earlier this year.

Retirement in effect meant the shedding of administrative and teaching duties in order to devote herself fulltime to research and her other interests. Much of this period was taken up with a study of the structure and distribution of nanoplankton, taking her on collecting trips to Greenland, Hudson Bay and Resolute Bay, Alaska, South Africa and the Galapagos Islands. Many papers resulted from this, with one major paper a month being maintained over a number of years. Her style of writing was instantly recognizable and her accounts were often racy, but always models of clarity. The quality of her work was recognized by her election to the Royal Society and to the Presidency of the Linnean Society of London, together with the award of honorary degrees from several countries and other honours in the form of medals and citations.

From all this it will be gathered that Irene Manton was a person of enormous energy, a quality much in demand in Botany House at Leeds, where her office was on the first floor, the SEM and darkrooms in the basement and the optical bench on the first floor – to say nothing of the teaching laboratories being located in a different part of the University and the experimental gardens about a mile away! One of my abiding memories as a student is of trailing panting after her in an effort to keep up.

Her relationship with her research students was warm, and they were collectively always affectionately known to her as "The Young". It was as "The Young" that we remained despite the passage of the years and the acquisition of families of our own who were in their turn included in the fellowship.

T. G. WALKER

CHARLES PLOWRIGHT PETCH
(1909–1987)

Charles Petch died suddenly at his home in Wolferton, Norfolk on 8 December 1987. Born and educated in the county, he was recording the local flora whilst still at school at Gresham's.

He was one of a party of six from the Universities of Oxford and Cambridge to visit the deserted island of St Kilda in 1931 (the inhabitants had been evacuated in 1930), and his paper on 'The vegetation of St Kilda' was published in *J. Ecol.* 21: 92–100 (1933). After obtaining first class Honours in Natural Sciences from St John's College, Cambridge, he taught at Stowe. He then returned to his former college and from there went to St Thomas' Hospital, qualifying as a physician in 1939. During World War II he served as a Medical Officer in the R.A.F. In 1948 he was appointed consultant physician to St Helier Hospital, Carshalton, a position he held until his retirement in 1975.

Whilst still at St Thomas', Charles married Margaret Stirling. She and their two sons would frequently accompany him in the field. A most hospitable family, they were always ready to entertain a grubby and noisy party of botanists to tea after a field meeting.

Charles joined the B.S.B.I. in 1952 and with the inception of the Mapping Scheme soon had his family out 'square bashing' in Norfolk. He was a meticulous recorder. In 1962, *West Norfolk plants today*, with E. L. Swann, was published as a supplement to *Proc. bot. Soc. Br. Isl.* 4 (1962). After his retirement Charles was appointed recorder for v.c. 28 and served on the Council of the B.S.B.I.

Although he lived and worked in Surrey, and Surrey botanists like to claim him as their own, his heart was in Norfolk, and it was there that he carried out the major part of his botanical and ecological work, often in collaboration with Eric Swann. Every holiday and on many weekends, Charles, his family and his 'cello' could be seen setting off in his old silver-grey Bentley in the direction of Norfolk, where he kept a caravan and a boat. He was a member of the Norfolk and Norwich Naturalists' Society, of which he was elected President for the year 1981–82. He contributed many papers on West Norfolk for the Society's *Transactions*, and to commemorate their centenary they published the *Flora of Norfolk* by C. P. Petch and E. L. Swann in 1968.

More recently he was a major contributor to the *Ecological Flora of Breckland*, edited by P. J. O. Trist, though he was critical of the random sampling method of recording, especially as it always seemed *just* to miss the rarities. He certainly knew the precise location of the interesting species in his neighbourhood. None of this "Well, it's along here somewhere": he knew exactly where to stop his car to point out to me the *Berberis* in the hedgerow or the rosettes of *Verbascum pulverulentum*. This was just as well if the weather was too appalling to open the car doors!

In Surrey Charles was a founder member of the Surrey Flora Committee in 1957, and a contributor to the *Flora of Surrey* (Lousley 1976). Following the sudden death of Ted Lousley in 1976, Charles Petch and Cecil Prime saw the *Flora* through to publication. Charles was elected to the S.F.C. in 1971, serving on it until his death. He was a very active member of the Committee, undertaking site recording and regularly attending field meetings. The area of Surrey that he chose to work in detail was the Lower Greensand around Leith Hill – perhaps because this was reminiscent of his native Norfolk, to which he later retired.

He was also a competent mycologist. This had been his father's profession. He led fungal forays in Surrey and Norfolk, and as his elder son writes, "the quality of our breakfasts was radically improved by his knowledge."

Charles was a reticent man, quick-tempered but with a pleasing sense of humour. "What has it to do with Norfolk County Council?", he inquired, when I referred to the N.C.C. at a Surrey meeting. I now realize that he must have had exceptional organizational ability. How else could he have managed a hospital consultancy, a private practice, beagling, sailing, walking, playing the 'cello, entertaining, and still contribute so much to the botanical and ecological knowledge of the counties of Surrey and Norfolk?

J. E. SMITH