OBITUARIES

Bryan Montague (1921–2004)

Bryan William St Leger Montague grew up in London. He left school at 15 and started training as an auto-mechanic, but also took evening classes in electrical engineering. At the outbreak of the Second World War he volunteered for the Royal Air Force, where he became a “radio-mechanic” attached to a top-secret radar division. He received rather little training in the field, but became so interested in the underlying microwave techniques that he signed up for correspondence courses.

When the war was over, Bryan decided to study physics at the University of London, which accepted him after he had passed the required entrance exams. He graduated in 1951, though by that time he had already become a technical information assistant for the Philips office in London.

After graduation he joined the television research group, working on electron optics and magnetic amplifiers before moving to the linear accelerator group, where he participated in the design and construction of a 15 MeV microtron. His interest in particle accelerators – as well as the challenge of joining a laboratory recently created to rebuild the unity of Europe – led him to apply for a job at CERN.

Bryan came to Switzerland in May 1955 and was attached to the CERN-PS division. His first task was testing high-power amplifier tubes in the linac group, before he was asked to take on the design of the modulator, as the specialist foreseen for this task had died in an accident. The modulator design was completed by 1960, when the PS was successfully commissioned.

Around 1962 Bryan joined – and later led – the RF separator project in the newly formed Accelerator Research division. The goal was to develop a separator for secondary particles above 5 GeV, where electrostatic separation becomes inefficient.

The design was based on ideas of Panofsky and Schrødinger for transverse separation, but was modified by Bryan to use hybrid modes, which he and Peter Bramham had (re)discovered experimentally when measuring propagation on disc-loaded structures.

From 1965 Bryan also took part in the study for a 300 GeV synchrotron, from which the CERN Super Proton Synchrotron evolved. However, when this project was postponed sine die in 1969, Bryan joined the newly formed Intersecting Storage Rings (ISR) project led by Kjell Johnson. Here Bryan worked first on the design of scrapers and collimators and then took part in commissioning the ISR, using the scrapers to measure the beam profile.

Later he joined the theoretical group whose task was to analyse and improve the ISR performance, and developed a computer code for the automatic measurement of luminosity. In the general studies group, he worked on the design of proton colliders with higher energy and proposed a method of increasing the luminosity of the ISR by reducing the crossing angle to give head-on collisions, using dipoles over the interaction regions to separate the counter-rotating proton beams. He also investigated non-linear coupling resonances caused by space charge – an effect still referred to as “Montague resonance”.

Bryan became a member of the Senior Staff Consultative Committee to the Director-General for three years, and during the third year acted as its spokesman. The task of this committee was to represent the interest of the academic staff of CERN. Hence he acted to balance the negative effects of the Abrahams Committee, constituted to reduce the cost of CERN so that the UK would not leave the organization.

In 1980 Bryan began work on the Large Electron Positron collider and concentrated on methods to obtain polarized beams in the machine. He developed rotator magnets, and studied Siberian snakes and spin matching. His most original contribution was a very clear description of polarization effects in storage rings using spinor algebra.

He also participated in the search for new methods of the acceleration of particles to even higher energies, and initiated a collaboration with the Rutherford Appleton Laboratory, which had the highest-power lasers in Europe, and Imperial College, London, to perform experiments on the acceleration of electrons with beat-waves created by two laser beams in a plasma.

From its inception in 1985, Bryan participated in the CUC study at CERN. In this he explored methods for obtaining polarized beams, and suggested the use of the extremely sensitive Hanbury–Brown–Twiss intensity interferometer for the exact alignment of beams, using the synchrotron radiation emitted in bends.

In 1985, the University of London awarded Bryan the degree of Doctor of Science (DSc) for his work on particle accelerators. He gave lectures at several CERN Accelerator Schools and contributed to the book on accelerator physics edited by Heinrich Schopper. Even after retirement Bryan continued to work on accelerators, and also contributed to quantum mechanics, pointing out the importance of the usually neglected phase factor of the complex wave function.

In his early eighties, Bryan suffered a severe aneurysm during a holiday trip to Italy, and finally passed away in May 2004.

Bruno W. Zetter, CERN.