Abraham Pais
1918–2000

Abraham Pais, eminent physicist and meticulous writer, died in Copenhagen on 28 July. The 20th century was characterized by tremendous strife and political upheavals on one hand, and by unprecedented progress in science and technology on the other. Pais influenced the latter and was himself deeply influenced by the former. In his autobiography *A Tale of Two Continents* (1997 Oxford), he concluded: “We do not know where we are going, nor even where we ought to be going.”

Pais was born in Amsterdam into a Sephardic Jewish family whose special traditions and roots went back over many centuries. This background remained a force throughout his life. After initial studies in Amsterdam, and with mathematical physics aspirations, he moved to George Uhlenbeck’s school in Utrecht. Here he encountered several leading European physicists, including Léon Rosenfeld, and made regular pilgrimages to Leiden for discussions with quantum theory pioneer Hendrik Kramers.

In 1940 the Netherlands were occupied and the German administration imposed 14 July 1941 as the deadline for Jewish students to be able to earn a doctorate. Rosenfeld had asked Pais to cast meson theory in terms of projective relativity. The highly motivated student succeeded with five days to spare. Pais claims that his intense focus on this work isolated him from the calamitous events going on all around. After trying to embark on a scientific career under impossible circumstances, in 1943 he went into hiding to avoid deportation. Two years later he was arrested, and then released, indirectly because of a plea that Kramers had written to Heisenberg.

Returning to science post-war, Pais soon received offers from Niels Bohr’s Institute in Copenhagen and from Princeton’s Institute for Advanced Study. In 1946 he moved to Copenhagen where he and Christian Møller, working on the decays of newly discovered particles, coined the word “lepton”. He also worked with Bohr on contemporary quantum issues.

In 1946 Pais took up a position at Princeton IAS at a time when a wind of change was blowing through quantum field theory. In 1947 he attended the famous Shelter Island conference, which marked the birth of modern quantum electrodynamics.

After continuous forays into field theory, the mysteries of the newly discovered particles began to intrigue him. In 1951 he was the one who showed that the new particles (subsequently called “strange”) had always to be produced in pairs – a phenomenon that came to be called “associated production”. Working with Murray Gell-Mann, who was also intrigued by the plethora of new particles, he looked at their possible classifications. This work led to their suggestion that mixtures of neutral kaon states could have different symmetry properties, and therefore decay in different ways. This set the scene for the subsequent discovery of CP violation. Continuing with neutral kaons, in 1955 Pais, now working with Oreste Piccioni, pointed out the possibility of “regeneration”, one of the most bizarre quantum phenomena.

Pais became a naturalized US citizen in 1954. In 1963 he moved to Rockefeller University, New York City, where he immediately became active in attempts to extend the pattern of particle symmetries.

In 1972 a chance invitation to write a review article launched him on an entirely new career as a writer. Benefiting from widespread contacts made during his research career, his subsequent output was prolific: besides numerous contributions to anthologies and festschriften, it began with the classic 1982 Einstein biography *Subtle is the Lord* (Pais got to know Einstein well at Princeton) and continued with the informative *Inward Bound: of Matter and Forces in the Physical World* (1986); then another classic, *Niels Bohr’s Times, in Physics, Philosophy and Polity* (1991); an autobiography, *A Tale of Two Continents: a Physicist’s Life in a Turbulent World* (1997); a second Einstein volume, *Einstein Lived Here* (1994); and, most recently, *The Genius of Science: a Portrait Gallery of 20th-Century Physicists* (2000).

Pais received major awards in the US and in the Netherlands for both his physics and his writing.