botanist, Bruno Huber. His research laid the foundation for the modern school of German dendrochronology which has remained at the forefront of tree-ring research in Europe to the present day.

The most significant advance in Quaternary chronology, however, came during and immediately after the Second World War, with the discovery that the decay of certain radioactive elements could form a basis for dating. Although measurements had been made more than 30 years earlier on radioactive minerals of supposedly Pleistocene age (Holmes, 1915), it was the pioneering work of Willard Libby and his colleagues that led to the development of radiocarbon dating, and to the establishment of the world's first radiocarbon dating laboratory at the University of Chicago in 1948. During the 1950s and 1960s, other **radiometric methods** were developed that built on technological advances (increasingly sophisticated instrumentation) and an increasing understanding of the nuclear decay process. These included uranium-series and potassium–argon dating (Chapter 3), while a growing appreciation of the effects on minerals and other materials of exposure to radiation led to the development of another family of techniques which includes thermo-luminescence, fission track and electron spin resonance dating (Chapter 4). In the late 1960s and 1970s, advances in molecular biology enabled post-mortem changes in protein structures to be used as a basis for dating (amino acid geochronology), while remarkable developments in coring technology led to the recovery of long-core sequences from ocean sediments and from polar ice sheets, out of which came the first marine and ice-core chronologies. The last two decades of the twentieth century have been characterised by a series of technological innovations that led not only to a further expansion in the range of Quaternary dating techniques, but also to significant improvements in analytical precision. A major advance was the development of accelerator mass spectrometry (AMS), which not only revolutionised radiocarbon dating (Chapter 2), but also made possible the technique of cosmogenic nuclide dating (section 3.4). The last decade has also witnessed the creation of the high-resolution chronologies from the GRIP and GISP2 Greenland ice cores, and from the Vostok and EPICA cores in Antarctica (section 5.5).

These various developments and innovations mean that Quaternary scientists now have at their disposal a portfolio of dating methods that could not have been dreamed of only a generation ago, and which are capable of dating events on timescales ranging from single years to millions of years. The year 2004 sees the 350th anniversary of the publication of the second edition of Ussher's ground-breaking volume on the age of the earth. How he would have reconciled the recent advances in Quaternary dating technology with his 6000-year estimate for the age of the earth is difficult to imagine!