theoretical inclination or contribution. In fact, the long quotations from published and unpublished lectures of the "maître de la Salpêtrière" which Gasser uses extensively reinforce the impression that Charcot was a great compiler of new knowledge and clinical cases who failed to produce any revolutionary synthesis of import. His major contribution to medicine was indeed more in the field of nosography and medical specialization. As Charcot stated in a lively debate on motor localization: "Je suis empirique et reste empirique".

Bernard Brais, Montreal General Hospital

H A Snellen, *Willem Einthoven (1860–1927): father of electrocardiography: life and work, ancestors and contemporaries*, Dordrecht, Kluwer Academic Publishers, 1995, pp. 140, illus., £24.50, $40.00, Dfl 60.00 (0–7923–3274–1).

The nineteenth century saw some notable advances in the diagnosis of heart disease. Early on it was possible to detect cardiac enlargement by percussion and valvular lesions by auscultation, but abnormal cardiac rhythms, which intrigued many physicians, could not be diagnosed by these methods and it was much later that mechanical records allowed progress to be made in this field. Even so the nature of quite common cardiac arrhythmias, such as extrasystoles, remained a problem up to around 1900.

The instrument which was to prove the Rosetta stone to unravel these cardiac irregularities was the electrocardiograph, and in 1887 the first electrical record of the heart beat in man was obtained by the London physiologist Augustus D Waller, who invented the word electrocardiogram. He used Lippman's capillary electrometer but it gave only rather inadequate records of the heart beat. It was this apparatus and this discovery which stimulated Willem Einthoven, working in Leiden, Holland, to invent the modern electrocardiograph. Einthoven was a physiologist with a good grasp of mathematics and physics, and he worked at the problem of overcoming the defects of the electrometer with great persistence, intelligence and ingenuity. His answer was the string galvanometer, in which the tiny cardiac currents were led through a very fine metallic coated quartz thread suspended between the poles of a powerful electro-magnet, whose shadow was magnified onto photographic film. Einthoven's invention led to the precise recognition of cardiac arrhythmias and soon to the diagnosis of disease in the heart muscle itself.

Einthoven first reported his invention in 1901 and published his first electrocardiograms in 1903. In order to get tracings readily from cardiac patients he had the signals transmitted over telephone wires to his laboratory from the university hospital one mile away. By 1906 he was able to publish a seminal paper with recordings of several human arrhythmias, but even much earlier, in 1893, he had seen that electrocardiography would be a new method of clinical investigation. His galvanometer, together with Roentgen's discovery of X-rays, revolutionized clinical diagnosis. It was his idea to label the five electrical waves of the heart beat as P, Q, R, S, and T following the convention in physics, started by René Descartes, that points on a curve were labelled from P onwards.

But Einthoven's collaboration with the physician at the university hospital, Dr Nolen, was short-lived. Fortunately, however, in 1908 a young British doctor, Thomas Lewis, visited Einthoven and soon became the world's leading authority on clinical and experimental electrocardiography. He provided Einthoven with clinical expertise and the two men became close friends. Professor Snellen has already given an excellent account of their relationship in his book *Two pioneers of electrocardiography*, which reprints all their correspondence. He has also published a valuable book, *Selected papers on electrocardiography of Willem Einthoven*.

In the present volume the author devotes two chapters to various times in his life, with good

pictures of his laboratory and apparatus. There are also photographs of some of his colleagues. But the best illustration, which will appeal to many, is the superb pencil portrait done by his grand-niece Lucie when she was only thirteen years old. Einthoven was looked on with admiration by his friends and associates for his unfailing courtesy, patience, and modesty, as well as for his genius and untiring devotion to his work.

Professor Snellen acknowledges his debt to two earlier books about Einthoven written in Dutch, especially to the full account by A de Waart published in 1957. The present volume is not a complete biography but it provides a most welcome and useful account of Einthoven's life and work, and it contains material which has not previously been published. Many cardiologists and medical historians will be indebted to Professor Snellen and will salute him for completing, in his ninetieth year, this tribute to a great Dutch scientist.

Arthur Hollman, Pett, East Sussex

Charlotte Roberts and **Keith Manchester,** *The archaeology of disease*, 2nd ed., Far Thrupp, Glos., Alan Sutton, and Ithaca, Cornell University Press, 1995, pp. x, 243, illus., £25.00 (0–7509–0595–6).

This work is the second edition of Keith Manchester's book of the same title (Bradford, 1983), which sought to survey the various ways and means by which palaeopathology can identify and interpret illnesses and injuries of the past from the human skeletal remains found in archaeological contexts. Two introductory chapters introduce the study of palaeopathology and such demographic issues as population size, structures of age and sex, stature, morbidity and mortality, and ethnicity and disease. Chapters on specific problems cover congenital disease, dentition, trauma (including battle injuries, scalping, infanticide, and cannibalism), joint disease, specific and non-specific infectious illnesses, metabolic and endocrine disease, and cancer.

Among the many merits of the book is its wide-ranging approach to its subject. Avoiding the temptation to restrict their inquiry to skeletal remains only, the authors also bring written records and works of art and ethnography into their discussion; their interpretation of disease phenomena is especially noteworthy for its emphasis on social and cultural factors. The chapter on congenital disease, for example, argues persuasively that palaeopathology can tell us much about attitudes toward the physically and mentally impaired in ancient societies, since many such individuals could have survived only if the family or communal group had been willing to devote considerable time and trouble to their care and support. Also noteworthy are the book's fine balance between clinical and historical insight, and the apparent ease with which it meets the challenge of describing an often highly technical field accurately, on the one hand, and clearly enough to meet the needs of non-specialists, on the other. Its precise yet lucid style perhaps owes much to the fact that its primary author is professionally qualified as both a medical practitioner and a university lecturer in the archaeological sciences.

The new edition marks a complete revision of the original 1983 work. The field of palaeopathology has advanced enormously in the interim and has witnessed important new developments; fully half of the bibliography and references serve to incorporate new research. A final chapter on "the next ten years" has been added to consider the main problems and priorities of the field as they appear in the mid-1990s. In the former category, the authors stress needs involving the collection of data and research results: a world-wide registry of palaeopathological cases, a central bibliography, a compilation on skeletal material with known histories, and a collection of clear illustrations of important case histories—in all such endeavours a focus on a standardization of recording is clearly essential. The need to apply new scientific techniques of microscopy, radiology, and biochemical analysis is also emphasized, with