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is part of that broader field of experimental pathology to which all medical sciences belong". This is reflected in the thirty important years Hardy spent as Chairman and Professor in the Department of Surgery at the University of Mississippi in Jackson, where he divided his activities among surgical practice, teaching, and research.

The period of his memoirs saw advances in surgical pathology and anaesthesia. Also arterial surgery, open-heart surgery, organ transplantation, and the artificial heart and other prostheses were developed. Following extensive research, including a study of the moral problems, his team undertook and recorded the first human lung and heart transplants, in 1963 and 1964 respectively.

Hardy was not only an active surgeon, but as an author contributed much to surgical literature. His wide reading, too, he regarded as a form of education. His most gratifying honour was his election as President of the American College of Surgeons in 1980.

It is ironic that James Hardy, vascular surgeon, should undergo in 1982 and 1985 carotid endarterectomy. His well-earned retirement allowed him professional rest to enjoy his "closely knit" family life.

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VIVIEN T. THOMAS, *Pioneering research in surgical shock and cardiovascular surgery. Vivien Thomas and his work with Alfred Blalock*, Philadelphia, University of Pennsylvania Press, 1985, 8vo, pp. xx, 245, illus., £29.95.

This is a remarkable autobiography by a remarkable man. Owing to "collapse of the Stock Market", this American Negro was unable to proceed to a medical career. Luckily, he became Alfred Blalock's technician first at Vanderbilt University and later at Johns Hopkins University, both in the Experimental Surgery Laboratories. With his aptitude to learn and his manual dexterity, during the next twenty-eight years, Vivien Thomas became a first-class trained surgical assistant. He was at the ringside at most of the pioneer procedures. Blalock's work on surgical shock deserves great credit. The development of cardiovascular surgery was largely due to the backroom expertise. This culminated in the successful correction of Fallot's Tetralogy in 1944, following eight years of intense research. Consideration of this anomaly was instigated by Helen Taussig and perfected by Blalock and Cooley on a child. It is now a routine procedure for "blue babies".

The old Hunterian Laboratory in Baltimore was the cradle of many surgeons who became well known in after years, such as Henry Bahnson, Denton Cooley, Rollins Halon, Mark Ravitch, and David C. Sabiston jun. Each contributed notable works in pioneering cardiovascular procedures, most of which were recorded in surgical journals. Sixty-four such papers are listed in the references.

Vivien Thomas was not only a skilled operator, but also helped in clinical assessment, invented a few surgical instruments, and taught routine animal surgery in the laboratory. With Blalock, he had a good loyal understanding. Towards the end of his chief's career, the research programme slackened. In 1971, Thomas was presented with a portrait of himself given by the Old Hands Club (former Halsted Residents). Five years later, the honorary degree of Doctor of Laws was conferred on him. Happily, the portraits of Blalock and Thomas hang beside each other in the lobby of the Alfred Blalock Clinical Science building—the master beside his right-hand man.

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RUDOLF VIRCHOW, *Medizin und Naturwissenschaft. Zwei Reden 1845*, with introduction by Werner Scheler, Berlin DDR, Akademie Verlag, 1986, 8vo, pp. 80, M.30.00.

Handsomely bound in red cloth with gold lettering on the front and spine, this volume is one in the series *Dokumente der Wissenschafts-geschichte*, edited by Christa Kirsten and Kurt Zeisler in

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East Germany. It contains two hitherto unpublished papers by Rudolf Virchow. They were delivered as lectures on 3 May and 2 August 1845 respectively, at the Medizinisch-chirurgischen Friedrich-Wilhelms-Institut in Berlin (from which Virchow had graduated only two years earlier). The hand-written texts, reproduced in facsimile in the present volume, eventually found their way into the Central Archives of the Academy of Sciences of the German Democratic Republic. They have been transcribed, edited, and annotated by Klaus Krauss. Werner Scheler has contributed a short but informative discussion of both papers. Krauss notes that a version of the first lecture—not the revised version given here—was published under the auspices of Johannes Orth in *Virchows Archiv* five years after the death of Virchow in 1902.

For the majority of readers the most interesting and immediately accessible aspect of these two lectures will undoubtedly be Virchow's uninhibited expression to his elders of his views on the proper scope and nature of medical science. He tells them that medicine must be looked on as an applied natural science based on anatomy, physiology, physics, and chemistry. "Life" does not depend on the action of a "life-force"; it is a mechanistic, causally-determined phenomenon based on cellular activity. A threefold path should be followed by medical investigators in the future: (1) studies in the clinic making use of all means offered by physics and chemistry; (2) experimentation on animals, including both the induction of disease and the trial of therapeutic agents; (3) autopsy studies of human tissues, making use of the scalpel, the microscope, and chemical reagents. Pathology, he tells his auditors in the second lecture, is nothing other than an application of Physiology (*Die Pathologie ist also weiter nichts als eine Anwendung der Physiologie*). Virchow continued to subscribe to these views for the remainder of his life.

Elsewhere in the two lectures Virchow deals at some length with the pathological physiology of inflammation. He asserts that all inflammatory exudates are amorphous in the beginning; only after more or less time has passed do pus cells begin to take form. Ten years were to pass before Virchow would enunciate the fundamental aphorism, *omnis cellula a cellula*, of his cellular pathology.

The publication of this volume is most welcome, and we look forward to the appearance of others in this series.

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