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together those sections which he assigns to author C, giving text, critical apparatus, translation, a brief commentary, and a good index of Greek words. He supplies a detailed account of the manuscript tradition, but what is lacking is any real discussion of ancient gynaecological theory. While this is a meticulous piece of work, it will do little to dispel any lingering doubts over the value, or indeed the possibility, of assigning Hippocratic texts to particular dates or to "schools". Grensemann's answers may be good, but is he asking the right questions of his texts?

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GWYN MACFARLANE, *Alexander Fleming. The man and the myth*, London, Hogarth Press (Chatto & Windus), 1984, 8vo, pp. xv, 304, illus., £12.50.

Of the several English-language biographies of Sir Alexander Fleming this is the most readable, and certainly the most accurate and complete. The author has taken immense pains to sift and evaluate the often contradictory statements which have been made about Fleming and his work.

The first two chapters capture his happy boyhood on Lochfield Farm, Ayrshire, where the foundations were laid of his acute powers of observation and his lifelong physical vigour and stamina: the first was relevant to his discovery of penicillin; and the second was probably never more needed than towards the end of his life, during his gruelling but triumphant foreign tours to receive countless honours.

Fleming was a brilliant student. In the list of his honours at the end of the book appears the entry: "1902-06. Almost all class prizes and scholarships at St Mary's Hospital Medical School." In the next few years, his distinctions included at least two gold medals, promising a brilliant research career. However, although he held a part-time post as Assistant in the Inoculation Department at St Mary's under Sir Almroth Wright, he was kept so busy setting up opsonin tests that there could have been little time for other work. Concurrently, he was building up a private practice.

At the outbreak of the war in 1914, Fleming and others went with Wright to France to work on the bacteriology of wounds. Their competent demonstrations that disinfectants instilled into a wound could not reach its recesses, and that in any case they killed the phagocytes more readily than the invading bacteria, were not well received by the majority of surgeons, who only slowly and reluctantly were convinced of the team's findings.

When they returned to St Mary's Hospital in 1919, "tired and shaken" by the horrific suffering they had seen, Fleming was appointed Assistant Director in the Inoculation Department. Quite soon, he discovered lysozyme and, with the help of V. D. Allison, over the next few years investigated its occurrence and properties. This is sometimes regarded as Fleming's best work. Few details were given of the actual discovery, and while it must be the duty of a scientific editor to prune a manuscript of irrelevant information, Macfarlane notes here and elsewhere that Fleming tended not to disclose information which would now have been of interest. Perhaps this is allied to his well-known taciturnity and his custom neither to deny nor confirm the suppositions of others as to what he had, or had not, done in any particular situation. This trait was one factor favouring the creation of the many myths which surrounded him and his work.

In 1921, Fleming took over from S. R. Douglas the responsibility for the preparation in the Inoculation Department of the vaccines which were marketed by Parke, Davis & Co. This commercial activity enabled the Department to be self-financing and independent of St Mary's. In addition, it contributed £43,000 of the £105,000 required to rebuild the Medical School in 1930-33. The commercial activities remained almost unknown until the publication in this journal of the informative paper by Ronald Hare, 'The scientific activities of Alexander Fleming, other than the discovery of penicillin' (1983, 27: 347-372). Hare states that Fleming remained in charge for thirty-four years, that his duties must have taken up a good deal of his time, and that they were carried out with extreme efficiency; if so, this adds a new and rarely quoted dimension to Fleming's working life. Hare is on several counts a key figure in the history of penicillin, for he was actually working in the Inoculation Department in 1928 when Fleming made his discovery. A professional bacteriologist, Hare was joint director of penicillin produc-

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tion for the Canadian Armed Forces during the 1939–45 war, then for about eighteen years Professor of Bacteriology at St Thomas's Hospital Medical School. His book, *The birth of penicillin and the disarming of microbes*, published in 1970 but, alas, out of print, provided a welcome reassessment of some of the myths which had accumulated during the previous forty years. Further valuable information, some of it derived from a careful study of Fleming's notebooks in the British Library, is to be found in another recent paper of his, 'New light on the history of penicillin' (this journal, 1982, 26: 1–24).

Fleming's discovery of penicillin took place in the autumn of 1928 and was described, together with some of its properties, in a workmanlike paper in the following year. It attracted little attention then or during the next twelve years, and within a year of his discovery Fleming had largely lost interest in it except as a selective adjuvant for microbial culture media. Thus, when Raistrick, the distinguished authority on new fungal metabolites, began work on penicillin in 1930 at the suggestion, not of Fleming but of W. C. Topley, the information provided by Fleming was minimal and communication between the two virtually non-existent. For example, Fleming did not even pass on the findings of his two medical student aides, Frederick Ridley, and Stuart Craddock. Their work had been not only laborious, but successful, in so far as they had found out (as reported by Hare, after studying Craddock's notes in the British Library) how to produce a protein-free concentrate that would certainly have allowed Fleming to carry out the crucial mouse protection experiments which eleven years later, elsewhere, demonstrated penicillin's potential – even if the "mould juice" itself had not served for that purpose. Ridley and Craddock received sadly inadequate recognition, and it is arguable that they should have been co-authors with Fleming of his original 1929 paper. Lewis Holt also worked briefly on penicillin; his important observations were never mentioned in print by Fleming and remained forgotten till recent years.

Macfarlane examines with great care the various reasons given by Fleming's other biographers as to why he did not pursue his discovery, especially as most of them were sure that he realized from the beginning its great medical importance. His clear summing up shows that this Great Mystery was built on a series of myths and that there *was* no mystery.

It is not in doubt that Fleming discovered penicillin, for which he deserves, and indeed has received, the gratitude of all mankind, though the cynic might ask how much of this gratitude he received during the decade following his discovery. The remarkable fact is that he did no further significant work on penicillin, yet twenty years later he was receiving universal adulation. Macfarlane points out that usually it is the developer of an academic discovery who gets the credit; e.g. Marconi, rather than Hertz; the Curies, rather than Becquerel. In what some would regard as a refreshing reversal of this tendency in the case of penicillin, there lies a fascinating story, convincingly told. It involves determination to capture some of the glory for the Inoculation Department, as evinced by Wright's letter to *The Times* of 31 August 1942 following the publication of the Oxford work; the entirely proper desire of St Mary's Hospital to make capital from the discovery; and a chance to boost national morale at a particularly gloomy stage of the war. With a well-disposed newspaper proprietor and none too critical help from the media, a durable and widespread international myth was created, namely, in its most extreme but not uncommon form, that Fleming was solely responsible for giving penicillin to suffering mankind. It is a historical fact that the introduction of penicillin into medicine took place in two stages; first, its discovery, then its demonstration as a systematic chemotherapeutic agent. Though there was no technical reason why the second stage should not follow on from the first, there was, in fact, a gap of some twelve years between the two essential stages. Only after the completion of the second did the value and importance of Fleming's observation become obvious. What would have happened, one wonders, had this second stage been delayed a further twelve years, or even till after Fleming's death? Or if it had been carried out by someone less averse to publicity than Florey, or more hungry for popular acclaim? To be fair to Fleming, Macfarlane states that he never claimed credit for work he had not done, and that it would have been almost impossible for him to try to arrest the growth of some of the myths attached to his work. Nevertheless, some would maintain that his already mentioned policy of never confirming or denying statements made by others about him and his work was at times carried to

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exasperating lengths. Another reviewer of this book describes the lengthy section dealing with the penicillin saga as “absolutely rivetting”, and one can only concur in this assessment.

In his final chapter Macfarlane discusses, among other things, whether Fleming was a “Great Scientist”. In the view of the present reviewer the answer must be No. His published work was carried out with very simple and elegant equipment, but with some exceptions, notably the work on wounds and on lysozyme, it was often of a technical nature and contributed little to the store of scientific knowledge. And his discovery of penicillin was not the result of patient research based on his own and others’ work, or on a reasoned search for the ideal antiseptic, or even on a random survey, but on a single experiment set up and completed by Nature herself. A brilliant and acute observer, which he undoubtedly was, is not the same as a scientific genius.

Luck has played a prominent part in the penicillin story, as both Fleming and Florey have freely admitted. On a different plane, Fleming would surely have considered himself fortunate to have so painstaking, perceptive and skilled an author for this, his latest biography.

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LESLIE T. MORTON, *A medical bibliography (Garrison and Morton): an annotated check-list of texts illustrating the history of medicine*, Aldershot, Hants, Gower Publishing Co., 1983, 8vo, pp. xii, 1000, £45.00.

If “Garrison and Morton” did not exist, it would be necessary to invent it, so indispensable have the successive editions of this “annotated check-list of texts illustrating the history of medicine” become. A “G–M” number immediately multiplies the price one would expect to pay for an old medical book, but inclusion has also become, by common consent, the equivalent of entry into the medico-historical Valhalla. To be sure, membership among the medical blessed need not be permanent, for items have been dropped as well as added, as Garrison’s original handlist of 1912 has grown into the present volume of precisely 1,000 pages.

Ironically, Fielding H. Garrison and Leslie T. Morton never actually co-operated in producing an edition of the bibliography. Garrison compiled two versions, the first in 1912 and an expanded one in 1933. Garrison died in 1936 and it was not until 1943 that Morton, then a young medical librarian, expanded Garrison’s final list, adding the valuable annotations that summarize the significance of the individual items. There were further editions in 1954 and 1970. About ten per cent of the 7,830 main entries in the present edition are new, and more than five per cent of the previous edition has not been included here, though many of the dropped entries are superseded secondary literature. The use of decimals and the acceptance of numerical gaps in the sequence allows numbers to be retained from earlier editions. The new primary references are concerned for the most part with medical and scientific discoveries and techniques of the present century. Undoubtedly, Mr Morton is wary of the recent past, and items like endorphins or monoclonal antibodies will have to await a further edition. A similar conservatism (perhaps less appropriate) also dictates Mr Morton’s choice of secondary works. There are several fine monographs on the history of plague since Shrewsbury’s (the most recent to be included), and out-dated surveys like Ralph Major’s *A history of medicine* and Alexander and Selesnick’s *The history of psychiatry* could be decently retired.

Inevitably, Garrison still casts a long shadow on his brain-child, and the positivism which permeated the original list still largely shapes its most recent incarnation. This is no bad thing unless it lulls its users into believing that the history of medicine is simply a series of discoveries inexorably leading to the present. Social aspects of medicine are under-represented when compared with scientific, and there is relatively little room for what sociologists are fond of calling “rejected knowledge”, even if such knowledge was important in its own time. There are, in addition, still too many modern authors without birth and/or death dates and occasional mistakes in the index. But “Garrison–Morton” remains an invaluable reference tool and, like Dr Johnson’s *Dictionary*, better for the fact that Mr Morton has chosen to produce it single-handedly. Its future will undoubtedly be as bright as its past.

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