

Manuscript Herbals.¹

THE herbals which have come down to us from pre-Renaissance days offer a vast field for inquiry, as yet imperfectly explored. Dr. Charles Singer's new memoir not only affords invaluable clues to the labyrinth of codices which confronts the perplexed student, but also illuminates the subject by treating it on broad lines and relating it to the main currents of thought. Dr. Singer believes that the herbal—or descriptive drug-list of vegetable remedies—had already assumed its definitive form in the fourth century before Christ, though no work so early in date is extant. We owe our first knowledge of Greek herbal literature to the "Historia Plantarum" of Theophrastus. The Ninth Book of this work, which may perhaps date from a period later than the death of the reputed author in 287 B.C., is believed to be a compilation from which we may gain an idea of the nature of the earliest herbals.

The most important work of the period before Christ is, however, that of Krateuas of Pontus, the medical attendant of Mithridates (120–63 B.C.); Krateuas was the first author to produce a herbal with figures, and he is thus the father of plant illustration. No actual copy of his work has survived, but Dr. Singer believes that we have the material for restoring a considerable part of it, which seems to have been used some centuries later in association with another materia medica—that of Dioskurides. The manuscript, which has so fortunately preserved for us this fragment of the herbal of Krateuas, is the most illustrious of all the early botanical codices. It was prepared in Constantinople about the year A.D. 512 for a noble lady, Juliana Anicia, the daughter of Flavius Anicius Olybrius, Emperor of the West. For the next thousand years or so it remained at Constantinople, where it suffered various vicissitudes; in 1569 the diplomatist Augier Busbecq, when on a diplomatic mission to that city from the Emperor Ferdinand I., found it in the hands of a Jew, and induced his royal master to buy it for a hundred ducats. For a long period it was one of the chief treasures of the Hofbibliothek at Vienna, but as a result of the War it is now transferred to St. Mark's Library at Venice. The codex includes a picture of Krateuas engaged in painting a mandrake, which is conveniently held up for his inspection by Epinoia, the Goddess of Intelligence, while Dioskurides sits by, writing an account of the plant.

The text of the manuscript contains, among other matter additional to Dioskurides, an account of the uses of eleven plants, avowedly taken from Krateuas; these descriptions are accompanied by excellent illustrations, which may reasonably be regarded as ultimately derived from the same author's pictures, and thus as dating from about seventy-five years before the birth of Christ. Dr. Singer gives outline reproductions of these eleven pictures, from which we can gather an adequate

impression of the essential character of the earliest of all illustrated herbals—the forerunner of the innumerable books with botanical pictures which have appeared in the two thousand years that have since elapsed. If we make allowance for the degradation which these drawings evidently suffered in the period of nearly six centuries which passed between their leaving the hand of Krateuas and appearing in the codex of Juliana Anicia, their qualities may well induce a sense of humiliation in the modern botanist; for their beauty and accuracy undermine the comfortable theory that the art of plant illustration has shown a progressive evolution. Indeed, it is not only on the artistic, but also on the medical side that degeneration rather than progress too often confronts the student of herbal literature as he passes the centuries in review.

Dr. Singer tells us that Andromachos of Crete, physician to Nero (A.D. 54–68), produced a modification of the *mithridate*, or panacea for all manner of poison, injury, and disease; and so late as the end of the eighteenth century, in certain continental cities it was still the custom to prepare once a year in public, in presence of the magistrates, a *Theriaca Andromachi*. The recipe of Andromachos himself included 45 items, while the eighteenth-century theriac had reached such absurd elaboration as to demand no less than 140 different ingredients! Though the theriac has died out under the wilting influence of modern scepticism, it has bequeathed to us the word 'treacle,' in which its memory survives as in an innocuous second childhood.

Andromachos was not the only Greek herbalist of the first century. Pamphilos, a physician who practised in Rome, had already written a book which appears to have been the first work on plants arranged in alphabetical order, and there were other writers of this period who dealt with vegetable drugs. All these herbalists are, however, entirely overshadowed in reputation by Pedanios Dioskurides of Anazarba, whose materia medica, which included about five hundred plants, was treated as the standard work for the next fifteen centuries—indeed in Arabic-speaking countries its influence survives even to the present day. Dioskurides, after studying in Alexandria and Tarsus, became physician to the Roman legions in Asia soon after the middle of the first century. His herbal shows an extensive knowledge of plants, but it does not reveal outstanding mental capacity or scientific insight. Attempts at the identification of the plants which he describes have occupied an astonishing amount of the time and energy of the botanists of later times; the difficulty of the task is due chiefly to the inadequacy of his descriptions, but in part also to the fact that even to-day the plants of Asia Minor have not been exhaustively explored. The authority attributed to Dioskurides led to the making of countless copies of his work, and the unravelling of the lineages of these various manuscript versions is a matter of the utmost difficulty and complexity. Dr. Singer gives a chart showing the results so far

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attained regarding the relationships and sources of the different groups.

We have already referred to the codex of Juliana Anicia. It is a signal instance of the passion for copying, rather than for original observation of Nature, which possessed herbalists even so late as the Renaissance period, that fifteenth-century copies of the illustrations of this manuscript are known—that is to say, a botanical artist in the fourteenth-hundreds was content to copy figures, some of which may have originated in the period before Christ, rather than to draw the flowers which were ready to his hand in his own countryside and garden. The same almost incredibly slavish and brainless copying characterised the text. The plant synonyms, which are a feature of the manuscripts of Dioskurides, were copied and re-copied right into the sixteenth century, though many of them were in strange tongues, which had been extinct for more than a thousand years. Dr. Singer lays stress upon the fact that the creative period of Greek science came to an end in the second century of the Christian era, and that, during the Dark and Middle Ages, the illustrated manuscript herbals are merely literary products, the preparation of which involved no genuine knowledge of plants.

The *materia medica* of Dioskurides was not the

only work of its class which was widely circulated in the Middle Ages. An immensely popular herbal was that of Apuleius, which is supposed to date from a Greek original of the fourth century; it is frequently combined with a Latin version of Dioskurides. How the name of Apuleius became associated with it is not known; the author of "The Golden Ass" had no concern with it. As in the case of Dioskurides, Dr. Singer gives a diagram indicating the probable descent of the principal groups of manuscripts. This herbal is of special interest to us in Great Britain, since versions of it exist which are of Anglo-Saxon and Anglo-Norman workmanship.

In the fifteenth century the inventions of printing and of wood-engraving rendered possible a new era in herbal history, but at first there was a failure to realise the distinctive potentialities of these inventions, and the earliest printed herbals diverged little from the preceding manuscripts. Dr. Singer concludes his work by demonstrating the continuity of the printed herbal with the manuscript tradition which gave it birth. His lucid memoir, with its numerous and exquisite illustrations, should awaken further interest in a subject which is far from being exhausted, and still stands greatly in need of workers trained in the methods of critical scholarship.

Obituary.

PROF. D. NOËL PATON, F.R.S.

THE death of Prof. Diarmid Noël Paton on Sept. 30 has removed an outstanding teacher of physiology, and a devoted investigator of the subject.

Noël Paton, the eldest son of Sir J. Noël Paton, the famous artist, was born in 1859. He was educated at Edinburgh Academy, where he had as classmates Herdman of Liverpool, D'Arcy Thompson of St. Andrews, and Haldane of Oxford. It is no wonder that when he passed to the University of Edinburgh he joined the Faculty of Science. He inclined at first towards zoology, then to botany, but having begun the study of medicine he found his real interest. After a distinguished undergraduate career he proceeded to Vienna for a short period of post-graduate medical work, and on his return to Edinburgh commenced general practice. He was offered and accepted a biological fellowship in the University of Edinburgh, and two years later, in 1886, he was appointed lecturer in physiology at Surgeons' Hall. He was able to devote his whole time to research and teaching when, in 1889, he was appointed superintendent of the Research Laboratory of the Royal College of Physicians, Edinburgh. He continued hard at work in Edinburgh until 1906, when he was nominated by the King to the Regius professorship of physiology in the University of Glasgow.

Noël Paton may rightly be regarded as one of the last 'all round' physiological teachers in Britain. He had a very wide and deep knowledge of his subject. Much of his energy and enthusiasm was given to the conduct of his classes. He was

a born teacher, and he expressed his views with clarity and thoroughness, being scrupulous to put before the student all sides of the problem under discussion. He believed intensely in his own interpretation of the facts, but he was insistent that the student should also make up his own mind. Even the appearance of laying down the one and only law was anathema to him. Throughout his course of physiology he never forgot that the majority of his hearers were going to be practitioners of medicine. He related as much as possible of his teaching to clinical work, often illustrating his points by the display of actual patients.

As a research worker Noël Paton was keen and energetic. He attacked his problem with a passionate devotion to the task, and he was unswerving in his endeavour to reach the truth. He had a horror of cheap and shoddy work. Any kind of special pleading, of the suppression of material facts or negative results, roused him to a righteous fury. His early research work was mainly devoted to chemical physiology; he was, indeed, one of the first workers in Britain to investigate metabolic problems. Although until the end he was interested in the chemical aspects of physiology, yet, as his own published work and that of those who worked under his direction show, his interests were wide and varied. This width of outlook is conspicuous in two of his books, "The Regulators of Metabolism" and "The Continuity of Life." It did not matter to him if his ideas clashed with popular or commonly accepted opinion.

So far as individual pieces of laboratory research are concerned, probably the most valuable is his