

JOHN TORREY: AMERICAN BOTANIST

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TO those familiar with the vast and productive western and middle-western regions of the United States, the realization may come as something of a shock that these spacious lands were not only little developed but also very little known a century ago. A recent book* embraces that very important phase of American history—the detailed exploration and development of the West. In it we learn much of the coming and going of expeditions, of the trials of explorers and administrators, and of the discovery of all manner of new features. The West was still a country where exploration in the full geographical sense could be carried out—in contrast to the world to-day which, to be honest, we must admit contains few if any major areas remaining to be discovered or even primarily surveyed—and it was still very much a land of wild Indians and all manner of dangers both known and unforeseen. Much the same was true, in lesser degree, of the Rocky Mountains and many tracts lying nearer to the eastern and southern fringes of civilization.

But the very period of these explorations (well on in the nineteenth century) was one of great scientific awakening and development; and so, fortunately, they saw a telescoping of geographical exposition with the scientific investigation which is the real and none the less fascinating work of the explorer of to-day.

Accordingly to the subject of this biography, the expeditions brought in plant collections in considerable number and variety, which led to his being the first to describe the flora of many areas that had previously remained unknown botanically. At first the recognition of the calls of botany needed activating by the instruction and dispatch of collectors; but in time it seemed to proceed almost automatically. Indeed, the reader might be excused if, in a fit of enthusiasm, he were to conclude that this account of the botanical investigation which proceeded in the United States in the days of John Torrey gave a very fair picture also of the history of American exploration in those momentous times.

Torrey the botanist was born in 1796 in New York, of a New England father of British ancestry, and died early in 1873 in his seventy-seventh year. Though a physician by training and to a considerable extent a chemist by profession, he was practically always a botanist by choice. Botany it was that brought him fame, and, through him, made great the name. His long and active life encompassed those of many famous botanists, whom he helped and encouraged in his own country and corresponded with in other parts of the world—so that the story of his work and times is punctuated with their names and contains long extracts from their correspondence.

We learn much of Amos Eaton, "the first great teacher of natural history in America"; of the scholarly mycologist Schweinitz (a prominent clergyman like the pioneering G. H. E. Muhlenberg, "the father of American botany"); of Nuttall, whom Sir

William Hooker termed "a queer fellow" though admitting that "he certainly does contrive to get access to most interesting plants"; of the Hookers themselves, both father and son; of David Douglas and Thomas Drummond; of Major Emory and Colonel Frémont, who frequently botanized instead of fighting; of William Darlington and Chester Dewey the caricologist; of D. C. Eaton, of Yale; of the admirable Engelmann, who for a while practised medicine, but then found the lure of botanical researches irresistible; of Tuckerman the lichenologist and Sullivant the bryologist; of the Bigelows and various LeContes; of John Lindley, of whose "Natural System" Torrey published an American edition in 1831; of C. C. Parry, who brought such distinction to western botany, though he was "one of the quietest men in the world—he *pokes* about and turns over any collection of plants that may be lying about" (according to Torrey, who appeared to agree that this was a good beginning for a botanist); of M. C. Leavenworth and Charles Wilkins Short; of Frederick Pursh, whom Torrey disliked as a man and (as is unfortunately common especially in a youthful civilization) accordingly underestimated as a botanist; of Edwin James, of Long's famous expedition in the Rocky Mountains; of Sir John Richardson and the peculiar Rafinesque; and, most notable of all, of the great Asa Gray, whose chief teacher and 'spiritual father' Torrey clearly was. We also learn much of the American learned societies of that day and this—including the Smithsonian Institution, the American Philosophical Society, the National Academy of Sciences at Washington, D.C., and the Lyceum of Natural History of New York with its successor the New York Academy of Sciences.

The author of Torrey's biography has obviously been at great pains to rout out all manner of data and evidence, both published and unpublished. Nevertheless the resulting publication is not without blemishes—as, for example, a fair quota of misprints and ambiguities, the rather loose literary style and apparent lack of expert editing, and the inclusion of such a welter of fact and seemingly minor detail that the result is at times confusing. Moreover, where so much space is given to the description of expeditions and the routes they took, it is surprising not to find more maps. The characters are also very numerous, coming and going so that the central one is apt to be swamped, and no very clear picture of John Torrey, the man, emerges. However, we are given here and there tantalizing glimpses of the real and rather lovable human being—as, for example, in extracts from his personal letters and in the anecdote about the child John who "considered it a great hardship to be sent after dark into the country . . ." although by day he loved the wild tracts beyond the small heart of contemporary New York.

In short, the book is not easy reading; but the theme is intensely interesting. For Torrey lived in one of the most vigorous phases of American history, a history which is seen in this biography from a new or at least unhackneyed angle—that of a pioneer in taxonomic and phytogeographical research whose experiences should prove valuable to students, botanical or otherwise, of the period or of that noble and fundamental science. For fundamental it is, in that taxonomy (most profitably with the background of its geographical offshoot) deals with the delimitation and identification, and where necessary the description and classification, of biological entities of

* John Torrey: a Story of North American Botany. By Andrew Denny Rodgers, III. Pp. x+352. (Princeton, N.J.: Princeton University Press; London: Oxford University Press, 1942.) 3.75 dollars or 25s. net.

innumerable sorts and sizes, and little enough botanical or zoological or other connected scientific work of a lasting nature can be accomplished without proper knowledge of what the entities concerned are.

Torrey's botanical publications began in his early twenties and extended, as those of so many devoted botanists have done, over more than half a century and until past the time of his death. In size and importance his papers and books grew through the first volume of his "Flora of the Northern and Middle Sections of the United States" (1824), then his monumental two-volume "Flora of the State of New York" (1843) and his joint work with Asa Gray on the "Flora of North America" (1838-43), which was the most searching and authoritative treatment of North American plants up to that time. Most of the expedition reports followed, though often in intervals between work at other subjects.

Torrey lived in the days when, at least in the New World, a man of science could easily be a 'professor' (the title often meaning less in America than in Europe) of different subjects at different times, or even of different subjects at the same time; and in fact Torrey was, as a young man, professor of chemistry and mineralogy at West Point, and later for many years professor of chemistry at Princeton and at the same time professor of botany and chemistry at the College of Physicians and Surgeons of New York (part of what is now Columbia University), where he had graduated. As a chemist he appears to have discovered pectin, which he called "sclerotin", while his chemical knowledge and ability received high recognition later in life when he was made United States assayer; but always he was in touch with, and usually he had a hand in, anything of importance, botanically speaking, which was going on in that rapidly developing country.

As a man Torrey was predominantly straightforward and hard-working, clearly owing his deserved and lasting fame to the consistent expression of these qualities through a life-long devotion to his favourite subject. He appears during his life-time to have been highly respected and widely loved. In the words of one of the most eminent of his successors in the modern practice of taxonomy, Prof. M. L. Fernald, of Harvard, "Torrey was exact, scholarly, a kindly and devoutly religious man, and in the goodness of his heart ready to help everyone". I have heard Prof. Fernald refer to Torrey's descriptions of plants as "wonderfully vivid and accurate, models to this day"—high praise indeed from the director of the Gray Herbarium, whose great founder was Torrey's pupil, assistant and then associate over a total span of more than forty years.

Gray himself styled Torrey "an investigator . . . characterized by a scrupulous accuracy, a remarkable fertility of mind, especially as shown in devising ways and means of research, and perhaps by some excess of caution", who had a "thorough love of truth for its own sake" and "took a prominent part down almost to the last days of his life" in putting into order and describing the materials coming in almost interminably from the exploring expeditions of the time. All this appeared to result from the circumstance that, as a boy, Torrey had been taught by Amos Eaton "the structure of flowers and the rudiments of botany" when Eaton was serving a term in the New York State prison, of which Torrey's father, Alderman William Torrey, was then fiscal agent. Eaton seems to have taught in such a way as to

'awaken a taste and kindle a zeal that could be extinguished only with the pupil's life'. How much greater in our scientifically enlightened days are the data and chances of the educator, and how vitally important his task!

The effect which Torrey has had on botanical knowledge and institutions in America can scarcely be over-emphasized. His name is commemorated in a 'unique' genus of the Coniferae, in numerous species of vascular plants, in a noble peak in the Rocky Mountains, and in the splendid Torrey Botanical Club; his herbarium exertions "representing a deal of back-ache" went far towards starting two of the greatest herbaria of the world, namely, the United States National Herbarium and the Herbarium of the New York Botanical Garden. Essentially an *American* botanist, finding more than enough to do within the confines of his own sub-continent, Torrey was content to describe rather than to classify, to investigate rather than to theorize—wisely leaving to others, whom he knew would come, the generalization for which he realized the time to be unripe.

Although essentially a practical man, Torrey was to a considerable extent a 'cabinet' botanist, though living in the days when such were needed. He did not experience the thrills and adventures of the actual explorers whose results he worked out so tirelessly and meticulously. His were rather the thrills and adventures of research—the excitement of the microscope and of testing the validity of speculations—the joys which strict compliance with the requisites of minute analysis may bring: for his was the imagination which can see a verdant treasure in a dried specimen. He had the all-important taxonomist's flair; and had he lived in these days of cytogenetics and physecology there can be little doubt that he would have backed or underlain this flair with far more field observation. As things were, however, he was hard put to it, in the midst of other and often more lucrative duties, to arrange and assort, then diagnose, name and describe, the new things which came to him almost daily. There is something of greatness in the man who can sit and wait and have all that he wants come to him; and in the aggregate Torrey must have named and described some thousands of new species and varieties of plants.

In most modern countries, as in the United States of America, botany is a great subject with a vast following both professional and lay—especially among the enlightened who realize that it is by plants that man is largely surrounded, and on them that he lives—consequently its study is imbued with sentiment and historical flavour. In deference to this we may appropriately conclude the present account by quoting Asa Gray, who thus closed his obituary notice of Torrey's life: "Thirty or forty years ago, a new and remarkable evergreen tree was discovered in our own Southern States, which it was at once determined should bear Dr. Torrey's name. More recently a congener was found in the noble forests of California. Another species had already been recognized in Japan, and lately a fourth in the mountains of Northern China. All four of them have been introduced and are greatly prized as ornamental trees in Europe. So that, all round the world, *Torreya taxifolia*, *Torreya Californica*, *Torreya nucifera*, and *Torreya grandis*—as well as his own important contributions to botany, of which they are a memorial—should keep our associate's memory as green as their own perpetual verdure".