Notes on Chinese-American Botanical Collaboration

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Collaborations between Chinese botanists and their colleagues in the West began in the early part of this century. In many cases, the bonds that fostered those collaborations were forged at Western institutions, including the Arnold Arboretum and Harvard University Herbaria.

Modern science first gained a foothold in China with the overthrow of the Qing Dynasty in 1912 and the cultural revolution that followed in 1915. Botany began there as it had in the West, with systematics: the names and relationships of plants had to be established before other research could proceed.

Work in systematic botany was partly inspired by the many Western collectors who developed a fascination for the rich Chinese flora. One of these was Charles Sprague Sargent, first director of the Arnold Arboretum, who made the study of East Asian plants a major focus of the Arboretum early in this century. Sargent's interest had been aroused by Asa Gray's observation (1859) that at least forty genera of plants occur only in eastern Asia and northeastern North America, an indication that the two flora are closely related. For Sargent, this suggested eastern Asia as a source of new plants for New England, since the species of one region might grow well in the other. The Arboretum's success in growing seeds sent from Beijing by Emil Bretschneider, a Russian physician living there, confirmed Sargent's theory, and he began to acquire Chinese specimens actively, at first chiefly through European institutions. In 1907 he hired Ernest H. Wilson to collect in western China; later he employed the collector and ethnologist Joseph F. C. Rock. As the Arboretum's collection of Chinese plants grew, so did knowledge of China's flora, thanks largely to Alfred Rehder, curator of the Arboretum's herbarium.

But Rehder was only one of several Western botanists who extended the the world's scientific knowledge of the Chinese flora. Others included the Regius Keeper of the Royal Botanic Gardens at Edinburgh, William Wright Smith; Heinrich Handel-Mazzetti, an Austrian who collected extensively in China and published the seven-volume *Symbolae Sinicae* (1929–1937); and the American Elmer D. Merrill, who worked throughout his career to advance the study of botany in China. On his first visit there, in 1916, Merrill helped establish the herbaria at Lingnan University in Canton and at the University of Nanjing. He also collected plants in the vicinity of Canton with botanists from Lingnan and returned a year later for more extensive fieldwork. He identified plants for the herbaria of many institutions, including those at Lingnan, Nanjing, and the Fan Memorial Institute of Biology (Beijing). In his various directorships, beginning in 1916 at the Bureau of Science in Manila and continuing at the University of California's College of Agriculture, the New York Botanical Garden, and the Arnold Arboretum, he supported botanical exploration by Chinese institutions through cooperative arrangements.

Just as Americans had earlier been obliged to travel to European herbaria to study American plants, Chinese in the early part of this century were obliged to travel to American and European institutions to study Chinese plants. The China Foundation for the Promotion of Education and Culture sent students to the Royal Botanic Gardens at Kew and Edinburgh, Jardin des Plantes, the Berlin Botanic Garden, the New York Botanical Garden, and the Arnold Arboretum. Had the early Chinese botanists not been able to use the research collections at these

Professor John G Jack (left) and three of his Chinese students examining a black maple (Acer saccharum *var.* nigrum) *photographed in the Arnold Arboretum during the summer of 1917*

institutions, they would have had to begin their study of the flora of their country from the very beginning. Woon-Young Chun came to Harvard in 1915 specifically to use the rich collections at the Arboretum, because "it would take me a lifetime of travel to study what I can find out here about Chinese trees in a few years" (Haas 1988).

The Arboretum did not officially offer graduate instruction, but did admit special students who could pursue botanical research with the use of the Arboretum's herbarium, library, and living collections. Assistance was also available from the staff, usually in the person of John G. Jack. Chinese students often registered at the Arboretum's neighbor and fellow Harvard institution, the Bussey Institution for Research in Applied Biology, which offered graduate studies in subjects related to agriculture, such as genetics, entomology, plant anatomy, and economic botany. In addition to Jack's work at the Arboretum—checking plant identifications, lecturing to field classes, and supervising the plantings—he was associated with both the Bussey and the Harvard Forest as assistant professor of dendrology and of forestry. He shared Sargent's interest in east Asian flora and in 1905 traveled to Japan, Korea, and China at his own expense to collect specimens for the Arboretum.

An enthusiastic and effective teacher, Jack went out of his way to help his Chinese students, often paying their wages for work at the Arboretum out of his own pocket or arranging Harvard loans for them. He helped them classify their plant specimens and prepare their manuscripts for publication. One of those students, Hsen Hsu Hu, maintained a warm correspondence with his teacher after his return to China

Undated photograph of H. H. Hu.

and honored him (and his relationship to Chinese botany) in the name of a new genus, *Sinojackia*. (Hu named another new genus in Styracaceae, *Rehderodendron*, for the Arboretum's taxonomist.)

Chinese students had been coming to America since shortly before the turn of the century; by the teens, 1,600 Chinese were studying in the United States. H. H. Hu was among the first generation of botanists to come to Harvard for graduate training. He had acquired an undergraduate degree at the University of California at Berkeley in 1916 and then returned to China for seven years, teaching at the Nanjing Higher Normal School (the predecessor of the National Southeastern University, Nanjing) and pursuing fieldwork in Zhejiang and Jiangxi provinces (Haas 1988, Li 1944).

Hu first made contact with the Arnold Arboretum by sending specimens, a standard method used by Chinese botanists to establish relationships with eminent botanists in the West. In 1920 he sent Sargent a collection of woody specimens from Jiangxi Province, asking Sargent to identify them in return. Over the years, he built up the research collections at Southeastern University by attaching Sargent's identifications to an identically numbered duplicate set retained in Nanjing.

Hu was enrolled at the Bussey Institution from September 1923 to June 1925, during which time he took four forestry courses with John Jack. He left Harvard with a doctor of science degree and a thesis on the genera of Chinese flowering plants that was to be published in multiple volumes. Expectations for this pioneering generation were high. In his 1924–1925 annual report, Dean Wheeler of the Bussey Institution wrote:

> [Hu's thesis] will be the foundation for all manuals on the flora of China and a necessary and valuable aid to students of the plant life of that extensive country. Professor Hu proposes to conduct vigorous explorations and studies of the complex and comparatively little known plant life of his native country, and in this work he will continue to have such assistance and cooperation as Professor Jack can give.

Hu's letters to Jack in the 1930s portray botanists full of energy and zest for the opportunities before them. The war with Japan began in 1931 and caused many upheavals, but none so great as to stop progress in science. In 1933 Hu wrote,

> I believe if we can resist Japanese aggression, there will be a very important scientific renascence in China. . . . The time for dallying about philosophy and political science and economic theories and revolutionary jargon is passed. We are setting heart to learn real things" (7/15/33).

Plant-collecting expeditions were mounted. Taking the advice of C. S. Sargent, Woon-Young Chun used his 1919 Sheldon Travelling Fellowship from Harvard to begin collecting plants on southern China's unexplored Hainan Island. He amassed a collection that by 1934 Hu described as "enormously large"; like many collections, it was shared with the Arnold Arboretum. Hu's collector, Mr. Wang, explored southwestern Sichuan and "penetrated southeast Tibet where Handel-Mazzetti and George Forrest and indeed

any white man have not penetrated." The yield was ten specimens of each of 10,000 numbers, or kinds of plants. Hu also directed a five-year investigation of Yunnan Province that began in 1933 and by 1936 had harvested 3,000 numbers and 30,000 specimens. The Royal Horticultural Society and Arnold Arboretum cooperated with the Fan Memorial Institute of Biology on a seed-collecting trip to the Burma-Yunnan border; many herbarium specimens and rare seeds were collected.

> "The rare rhododendron, R. sinonuttallii [now *R. nuttallii*] of which only 3 mature fruits have been collected by Kingdon Ward, we found in great abundance and 60 mature fruits have been collected last year" (2/3/39).

New plants were discovered, named, and studied. In Yunnan new species of tropical genera were too numerous to detail. In southwestern Yunnan alone two dozen new species of *Castanopsis, Pasania,* and *Quercus* were collected. Sometimes plants were renamed: Chun placed two species in genus *Rehderodendron* that Hu revised and placed in separate genera; Merrill informed Hu that his *Sinomerrillii* was *Neuropeltis racemosum* Wall (3/7/38). *Huodendron* was discovered almost simultaneously by Hu, Chun, and Rehder, on which Hu commented, "Such things as these are quite heartening" (8/6/35).

New institutions were founded. H. H. Hu joined the new Fan Memorial Institute of Biology in Beijing as head of botany in the late 1920s, later to become its director. In 1934 he established a 1,700-acre arboretum and botanical garden at Guling (Lushan Arboretum and Botanical Garden). After only a year a seed list had been issued and they had procured 3,800 kinds of seeds. In 1938 it was in Kunming, the capital of Yunnan Province, that a new botanical institute was organized, and Hu was asked to initiate yet another in eastern Tibet, "which E. H. Wilson explored 30 years ago—the type locality for many botanical treasures, Muping, will be next door" (11/18/38). When the staff of Lushan Botanical Garden was obliged to evacuate owing to the war in 1939, Hu sent them to Kunming to help with the new institute.

Publications abounded. In 1921 W. Y. Chun published *Chinese Economic Trees,* a work he had begun at Harvard. *Icones Plantarum Sinicarum,* a collaborative effort by Hu and Chun, was published in five large-format volumes, 1927 to 1938. (The first volume was dedicated to Charles S. Sargent, the fourth to E. D. Merrill, and the fifth to Alfred Rehder.) Hu's very long list of publications included enumerations of plants, descriptions of new species and genera, analytical keys, geographic distribution studies. He collaborated with R. W. Chaney on a study of Miocene flora in North Shantung, China. For years he ambitiously planned a "Silva of China, after the fashion of Prof. Sargent's Silva of North America" (6/17/31). In 1948 the sole volume of *Silva of China, A Description of Trees Growing Naturally in China,* volume 2, Betulaceae to Corylaceae, was published.

Throughout the afflictions and dislocations of war, Hu retained his confidence. In 1939 he wrote, "You may be sure that epoch-making

Woon-Yung Chun, founder and director of the South China Botanical Institute, Canton, and collaborator with H. H. Hu on Icones Plantarum Sinicarum.

developments of Chinese horticulture is about to be initiated" (2/3/39). In 1948 he briefly summed up the accomplishments of his generation of Chinese botanists:

> Since Chinese botanists have taken active part in the botanical exploration and systematic studies of Chinese flora, numerous new discoveries have been made, such as the genera *Pseudotaxus, Nothotsuga, Smithiodendron, Sinojackia, Rehderodendron, Huodendron, and Zenia,* all interesting trees, both botanically and horticulturally. Crowning all is the *Metasequoia,* . . . the "living fossil" discovered in Central China, the most remarkable botanical discovery in the century (Hu 1948).

Very soon thereafter, following the successful revolution led by the Chinese Communist Party, science in China was completely reorganized. On 1 November 1949, the Chinese Academy of Sciences was established as the umbrella organization for scientific research institutes in the Beijing area. Work was suspended at the Fan Memorial Institute while control was transferred to the new Academy. In a 1949 letter to Elmer Merrill, Hu voiced a hope that the Institute would return to normal operations when the new arrangements were complete, but that was not to happen in his lifetime (11/24). When China's Great Proletarian Cultural Revolution began in 1966, most scientific work came to a halt; Hu died in 1968.

In the mid-1970s scientific work resumed, and communication between Chinese and American botanists was slowly re-established. Botanical collaboration between the two countries officially resumed in 1978 with an invitation to a delegation of American botanists—among them Richard A. Howard, then director of the Arnold Arboretum—to tour botanical gardens and institutions in the People's Republic of China.

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