

# How *Metasequoia*, the “Living Fossil,” Was Discovered in China

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Professor Hsen Hsu Hu (1894–1968) was director of the Fan Memorial Institute of Biology in Beijing when he collaborated with Wan-Chun Cheng (1904–1983), professor of forestry at National Central University in Zhongjing, in naming and describing *Metasequoia glyptostroboides*. He had been among the first from his country to study botany in the West, and was the first Chinese botanist to receive a doctorate from Harvard University. Primary credit for the discovery of *Metasequoia glyptostroboides* belongs to Professor Hu and his Chinese colleagues.

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In the winter of 1941 Professor T. Kan of the Department of Forestry of the National Central University journeyed from Hupeh to Szechuan, and saw on the roadside at Mou-tao-chi in Wan Hsien a large deciduous tree that was called by the natives *shui-sa*, or water fir. This attracted the attention of Professor Kan. Unfortunately no specimens were collected at that time as all the leaves had fallen off. Next year Professor Kan requested Mr. Lung-hsin Yang, the principal of the Agricultural High School, to collect herbarium specimens for him. But these were not identified. In the summer of 1944 Mr. T. Wang, a staff member of the Central Bureau of Forest Research, went to western Hupeh to explore the forests at Shen-lung-chia, and was asked by Mr. Lung-hsin Yang to go to western Hupeh by way of Wan Hsien and Enshi in order to investigate the *shui-sa* at Mou-tao-chi.

At Mou-tao-chi Mr. Wang collected herbarium specimens of leafy branches and fruits of this tree and thought it to be *Glyptostrobus pensilis* Koch, or *shui-sung*, the water pine, which is a common deciduous coniferous tree in Kwangtung province found also in Kiangsi. Mr. Chung-lung Wu, an assistant in the department of forestry of the National Central University,

met Mr. Wang, who gave him a branchlet of the water fir with two cones. Mr. Wu presented these to Professor W. C. Cheng of the same department, who considered this tree not a *Glyptostrobus* but a new genus, on account of the opposite character of the peltate fruiting scales, which differ from those of *Glyptostrobus* although the deciduous linear leaves are somewhat similar.

Professor Cheng then sent his assistant, Mr. C. Y. Hsieh, to go twice to Mou-tao-chi in February and May 1946, and these trips resulted in the collection of specimens of flowers and young fruits of this water fir, from which Professor Cheng understood the morphology of this tree more clearly. In the autumn of the same year Professor Cheng sent to me fragments of herbarium specimens Mr. Hsieh collected and asked my opinion about this new genus, which he thought to be closely allied to the American genera *Sequoia* and *Sequoiadendron*, the California coastal redwood and the famous big tree.

It happened that I had a reprint of a paper by a Japanese paleobotanist, Mr. S. Miki, instructor in Kyoto University, entitled “On the Change of Flora in Eastern Asia since Tertiary Period,” in which he proposed the new generic name *Metasequoia*, based on two fossil species that

were formerly known as *Sequoia disticha* Heer and *Sequoia japonica* Endo, both found in the Pliocene beds near Tokyo. He found his new genus *Metasequoia* differing from the true *Sequoia* in the long stalk and in the opposite scales of the fruits. I had on hand also a paper by another Japanese paleobotanist, Professor S. Endo, entitled "A New Palaeogene Species of *Sequoia*," in which he published a new species, *Sequoia chinensis* Endo, from Eocene beds in Fushun coal mines in southern Manchuria and Kawakami coal mines in southern Saghalien. This I found to be also a species of *Metasequoia*. Thus I published a paper in the *Bulletin of the Geological Society of China*, Vol. 26, 1946, entitled "Notes on a Palaeogene Species of *Metasequoia* in China," in which I transferred *Sequoia chinensis* Endo to the genus *Metasequoia* and announced the discovery of a living species of this remarkable tree in Wan Hsien of Szechuan province.

I then communicated with Professor Ralph W. Chaney of the Department of Paleontology of the University of California, who had not seen either Miki's or Endo's paper. On the basis of the descriptions I supplied to him, Professor Chaney found that *Sequoia macrolepis* Heer, *S. fastigiata* Sternberg, *S. concinna* Heer, *S. Langsdorfii* Heer, *S. Nordenskioldi* Heer, *S. Reichenbachii* Heer, and *S. Heeri* Lesquereux all belonged to this new genus *Metasequoia*. He considered the discovery of this living *Metasequoia* the most interesting in botany in a century.

After Mr. Hsieh made the collection of herbarium specimens [1946] Professor Cheng sent a



The tree from which the type specimen of *Metasequoia glyptostroboides* was collected, in Modaoqi village in west central China. The drawing came to the Archives of the Arnold Arboretum through the courtesy of Dr. H. H. Hu.

specimen to Dr. E. D. Merrill for examination. I wrote to Dr. Merrill telling him my identification of this new tree to the fossil genus *Metasequoia* and requested him to send \$250 to enable Mr. Hsieh to go to Szechuan to collect seeds. Dr. Merrill sent the money and Mr. Hsieh flew to Chunking in the autumn of 1947 and then went to Mou-tao-chi where he collected large quanti-

ties of seeds,<sup>1</sup> which Professor Cheng sent to Dr. Merrill, who distributed them to 76 institutions and persons interested in trees for propagation purposes. I also distributed these seeds to a few institutions and persons abroad, and many important institutions of botany and forestry in China have been given seeds also for propagation purposes.

Last winter Professor Chaney wrote to me expressing his wish to visit the *Metasequoia* region to make personal investigations. Early in February this year Professor Chaney flew to Nanking and with Mr. Hsieh both flew to Chunking, from where they journeyed to Mou-tao-chi and Shui-sa-pa in Lichuan Hsien of Hupeh province. In these bandit-infested regions they explored for three weeks and took photographs and wood-borings and collected herbarium specimens of plants associated with this tree.<sup>2</sup> I met Professor Chaney in Nanking in the latter part of March. We discussed the phylogeny of *Metasequoia* and *Sequoia*, and the relationship between the families of Metasequoiaceae, Taxodiaceae, and Cupressaceae.<sup>3</sup>

At the same time we started the movement to establish a committee in the Chinese government for the conservation of *Metasequoia*, which is on the verge of extinction as there are found no more than 1,000 large and small trees of this living fossil in existence, and the peasants are still cutting the trees for interior finishing purposes. Now such a committee has been established, the ministries of interior, education, and agriculture, the Academia Sinica, the National Central Museum, and the Fan Memorial Institute of Biology all have representatives



W. C. Cheng, professor of forestry at National Central University in Nanjing and co-author of the botanical determination of *Metasequoia glyptostroboides*, journeyed to Sichuan and Hubei to see the tree for himself in August 1948. Here he stands on the buttressed trunk of the type tree in Modaoqi.

to participate in this work, looking forward to the establishment of a *Metasequoia* National Park in the type region: Professor Chaney was appointed a foreign member of this committee. Professors Merrill and Chaney have jointly made an appeal to subscribe money for this purpose.

Mr. Hwa has journeyed extensively in Szechuan and Hupeh to search for all the trees of *Metasequoia* growing in these regions. *Metasequoia* was first discovered at Mou-tao-chi of Wan Hsien in Szechuan province.<sup>4</sup> There are found three trees, the largest of which is 33 meters (108 feet) in height and 3.3 meters (10 feet) in diameter at the swelling buttress and 2 meters (6.6 feet) in diameter at breast height; the other two are small trees. These are all the *Metasequoia* trees found within the boundary of Szechuan province.<sup>5</sup> In Chien-nan county of Lichuan Hsien of Hupeh province Mr. Hwa discovered another tree measuring 30 meters (98

<sup>1</sup> It was C. T. Hwa, not Mr. Hsieh (Hsueh), who collected seeds in 1947.

<sup>2</sup> Chaney and most other sources give the date as early March; and once again, it was C. T. Hwa who accompanied Chaney. He and his party explored the region for three days, rather than three weeks.

<sup>3</sup> In their 1948 paper, "On the New Family Metasequoiaceae and on *Metasequoia glyptostroboides*, a Living Species of the Genus *Metasequoia* Found in Szechuan and Hupeh," H. H. Hu and W. C. Cheng proposed a new family, Metasequoiaceae, for the genus *Metasequoia*.

<sup>4</sup> The borders of Sichuan and Hubei have since been shifted, placing Mo-tao-chi in Hubei province.

<sup>5</sup> Since then, the part of Sichuan in which *Metasequoia* grew wild has become the administrative unit Chongqing Shi.



This drawing of the botanical characters of the *Metasequoia glyptostroboides* accompanied the publication of Hu and W. C. Cheng's formal description in the *Bulletin of the Fan Memorial Institute of Biology* (1948) *New Series* 1(2): 153-161.

feet) in height, 1 meter (3.3 feet) in diameter at breast height; another in Wang-cha-ying measuring 35 meters (115 feet) in height and 2.1 meters (7 feet) in diameter breast high. From Ta-pan-ying through Shui-sa-pa to Shio-ho, along valleys about 40 li long,<sup>6</sup> there are large and small trees, altogether about 1,000 individuals, among which the large ones there number about 100, the tallest measuring 30 meters (98 feet) in height. The natives frequently dig the wild young trees or make cuttings and plant them along the rice fields or streams or before their doors. North from Wan Hsien and south down to Shui-sa-pa, the *Metasequoia* region extends to an area about 800 square kilometers, with Shui-sa-pa as the distribution center. Altitudinally *Metasequoia* is distributed from 800 to 1,350 meters (2,600 to 4,400 feet). Within this region there is plenty of rainfall and a large amount of humidity, cool in summer and with heavy snow in winter. Its ideal site for propagation is the highlands in central and eastern and southwestern China at an altitude of about 1,000 meters (3,300 feet).

As Professor Chaney returned to Nanking, Mr. Hwa was left behind to make further exploration. He traveled extensively in western Hupeh. Though no further discovery of *Metasequoia* trees has been made, he discovered several large tracts of forests that have not been discovered before. He made extensive collections of herbarium specimens. Surely there will be new species of plants discovered.

<sup>6</sup> Li is a traditional Chinese measure of distance; it has been standardized at 500 meters, or 547 yards.