Plant Science: Report from China

Botany in China. Report of the Botanical Society of America Delegation to the People's Republic, May 20–June 18, 1978. ANITRA THORHAUG, Ed. United States–China Relations Program, Stanford University, Stanford, Calif., 1979 (available from Missouri Botanical Garden, St. Louis). xii, 154 pp. Paper, $7.50. United States–China Relations Report No. 6.

On 20 May 1978, ten members of the Botanical Society of America met in Hong Kong and set out on a four-week tour of Chinese botanical institutions, the first visit of its kind since the cultural revolution. The report they have jointly authored conveys the sense of momentousness they felt. Not a moment was to pass unrecorded; every place, every scientist, every discussion was to be noted, and, throughout, the visitors weighed up the likely bias of every crumb of information received.

They were clearly impressed. They were met with cordiality and a positive interest in collaboration. Their questions were answered with candor; and they were convinced that a balanced insight was gained into the state of Chinese botany. They concluded that, though their Chinese colleagues have been cut off from centers of research in the West for the last 30 years and compromised by the depredations of the Gang of Four, the science is now expanding again with vigor, determination, and ingenuity.

The delegates visited 36 institutions in eight cities and met 300 plant scientists and administrators. They reported, as far as they could, on the size, facilities, work conditions, and level of instruction and research in each. One gains from their report that research institutions and universities are generally poorly equipped, that libraries have frequently been neglected or destroyed, and that, though most institutions are highly staffed, standards are uneven. The numbers of students were still generally low at the time of the visit, but rapid increases were expected. The visitors were particularly impressed with the high degree of integration between the work of scientific institutions pursuing applied research and activity in the communes.

Systematic botany has again recovered its high status in Chinese botany. The ambitious Flora of China is making good progress again, and provincial floras are being published concurrently. The state of herbarium resources varied greatly from one institution to another, however, several having been disrupted by the cultural revolution. Lack of contact with herbaria outside China and shortage of literature must have hampered work and led to unnecessary synonymy, but there is a clear desire to break from the isolation. The emphasis given to floristic research by the utilitarian Chinese government reflects the ancient and continuing sophistication of Chinese ethnobotany, and in particular their extraordinary proficiency in herbal medicine. Curiously, pharmaceutical research receives scant attention in the report.

Close government control of research, combined with clear establishment of priorities, is manifested by an unfortunate repetitiousness in Chinese research, many institutions apparently pursuing almost identical work in isolation. This was particularly noticeable in crop research. Work on nitrogen fixation appeared to be the dominant priority in plant physiology, and anther culture for haploid breeding, the utilization of heterosis in self-pollinating crops, and the now well-known and controversial intergeneric hybridization are being pursued by a number of laboratories. The American botanists were impressed with results being achieved by the "three-line" approach in breeding rice, wheat, cotton, and sorghum. Here a male sterile hybrid is used to established a line, and maintainer and restorer lines are selected from superior cultivated strains; crossing between the male sterile and maintainer plants produces further male sterile hybrids, which are crossed in turn with the restorer plants to produce new fertile cultivars. The Americans were skeptical, however, about the degree of success claimed by some institutions in wide hybridization, initially between rice and bamboo, and later between various monocotyledonous crop genera and even wheat and pea. The first success was claimed by farmers during the cultural revolution and the work was subsequently pursued in research institutions, but no convincing examples were seen and several Chinese scientists themselves appeared unconvinced.

A variety of other fields are reported on to a lesser extent, including biochemistry, plant physiology, and cellular biology, paleobotany, marine botany, pollution ecology, and production of marsh gas.

Clearly, opportunities for collaboration between Chinese and American botanists are increasing, but there is a real danger that an uncoordinated rush of initiatives will lead to renewed difficulties. Interchanges are therefore wisely being handled through a steering committee established for this purpose by the Botanical Society.

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Memory as Cognition

Memory Organization and Structures. Papers from a conference, Lancaster, Pa., March 1977. C. RICHARD PUFF, Ed. Academic Press, New York, 1979. xviii, 412 pp., illus. $27.50.

In 1970, Gordon Bower began a paper with the sentence: "A modest revolution is afoot today within the field of human learning, and the rebels are marching under the banner of 'cognitive organization.' " Two years later, the revolution was thriving, as evidenced by the collection of papers *Organization of Memory* edited by Tulving and Donaldson. Today, the cognitive approach dominates the field; associative theorists, particularly those investigating the recall of word lists, are subjected to second-class treatment. The book that is the subject of this review attempts to document the gains of the revolution. The volume comprises 12 papers. An excellent paper by James Voss contrasts the organization view of memory with the association view that it is meant to replace, giving reasons for transforming the rememberer from the 1950's passive associator of stimuli and responses to the modern active organizer of information. Voss also briefly reviews recent work on discourse processing.

A portion of the remaining chapters continue themes that were well represented in *Organization of Memory*. Among the topics discussed in these chapters are the measurement of organization, particularly in free recall, and the