The fun of accomplishment kept us all busy, too busy to write about what we were doing and the fun we were having doing it. . . .

Now, for the first time, we can read the very human story of a really active participant in computer development. Herman Lukoff was one of the handful of engineers who worked with Pres Eckert and me at the University of Pennsylvania, designing, building and testing the first electronic digital computer.

The title of the book is worth an explanation. Lukoff's hobby as a youngster was radio, and he used the Morse code for communication. The book tells of his evolution from the "dits" (and "dahs") of the Morse code to the "bits" of information used in the computer.

The "dits" portion of the book has to do primarily with Lukoff's early years, during which he managed, in a nontechnical family and with a minuscule allowance, to acquire an excellent knowledge of electronics and radio circuitry by reading and experimenting. Apparently history, with infinite variations, does repeat itself, because this reviewer acquired his early electronics background in the same manner.

Chapters 3 and 4 of the book cover Lukoff's college years at the University of Pennsylvania's Moore School and his association with the ENIAC (Electronic Numerical Integrator and Computer), then being developed there under the direction of Eckert and Mauchly. Lukoff devotes a chapter to his "time out for the Navy." Then in 1946 he is back at the university working on the EDVAC (Electronic Discrete Variable Automatic Computer). When Eckert and Mauchly left the university, after a dispute over patent rights, and formed their own company, Lukoff accepted a position with the new company. We relive his experiences in the industrial and commercial sphere as the initial company, Electronic Control Company, evolves into a corporation, Eckert-Mauchly Corporation, is purchased by Remington Rand, and becomes, as a division of Sperry Rand, Remington Rand Univac and then Sperry Univac. These chapters encompass Lukoff's days (and many nights) with the BINAC (Binary Automatic Computer), the UNIVAC I (Universal Automatic Computer), and the "ahead of its time" computer, the LARC (Livermore Automated Research Computer). The concluding chapter presents some highlights subsequent to the completion of the LARC.

The book blends accounts of technological progress and frustration with Lukoff's own viewpoints and accounts of his personal triumphs and disappointments. I can vouch for its historical accuracy, having been involved from the U.S. government's side, as a customer, in many of the events described. I spent a year and a half at the Eckert-Mauchly plant in close contact with Lukoff, and for many more years continued to have business contacts with him.

The book is enhanced by an excellent glossary to guide the reader through the sometimes specialized computer terms used in the text and a bibliography for those interested in delving deeper.

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Alpine Plants

Ecology and Phytogeography of High Altitude Plants of the Northwest Himalaya. Introduction to High Altitude Botany. M. S. MANI. Chapman and Hall, London, 1979 (U.S. distributor, Halsted [Wiley], New York). xii, 206 pp., illus., + plates. $40.

M. S. Mani has had a long and distinguished career as the premier high-mountain biologist in India. His books on the ecology and biogeography of alpine insects are invaluable to an understanding of their adaptations and ecosystemic roles in these cold, severe environments. In the present book, he shifts his attention to adaptations and geographical relationships of the plants in his favorite milieu: the high, relatively dry, and continental northwestern Himalaya. This region has a set of high-mountain environments rather different from those of the Nepal Himalaya and the East Himalaya. Mani makes the shift in subject matter with rather mixed results.

The real value of the book is in chapters 4 and 5, which list some typical high-mountain plant families, genera, and species in the Northwest Himalaya and their vertical distribution in relation to alpine environments. Among these is *Christolea himalayensis*, in the mustard family, collected at an elevation of 6300 meters by G. Singh. This is the highest recorded flowering plant on earth. It slightly exceeds the previous record of 6222 meters for *Arenaria musciformis*, in the pink family, collected in the Nepal Himalaya by A. F. R. Wollaston on the first British Everest Expedition in 1921. The latter collection is apparently unknown to Mani. While Mani's list of plants is not complete and is written in a rather casual way, with mostly qualitative data, it is useful because of the scarcity of easily accessible information on the flora of this part of the Himalaya. These mountains are much drier than the better-known Nepal Himalaya; the flora reflects this.

Chapter 3, on the ecology of high-altitude plants, is a disappointment. Throughout the chapter, teleology prevails. The author is not conversant with the modern physiological ecology of high-mountain plants. He makes numerous assumptions based upon few, if any, data. There are a number of factual errors in this chapter in regard to plant adaptations to severe alpine environments. It is stated that "nearly all plants that belong to the ecosystems present more or less the same general and uniform habits." This is true only to a very limited extent. The differences far outweigh the similarities for root systems as well as aboveground characteristics. I doubt that root systems of alpine plants in the Northwest Himalaya are "nearly all . . . characteristically succulent" and that "superficial fibrous roots are the general character of high altitude plants," for in other high mountains diversity in root system types is the rule rather than the exception.

The last chapter (on phytogeography) has a section on affinities. While rather wordy and qualitative, it seems to me the best and most fascinating part of the book. Some, but not all, floristic plant geographers have included the entire Himalaya in the Sino-Japanese floristic region. Mani, largely depending upon the works of several Russian botanists and the Dane Paulsen, correctly demonstrates the very strong affinities of the Northwest Himalayan alpine flora with those of the Pamir and the central Tien Shan in the Western and Central Asiatic floristic region. Troll, Meusel, and Gupta have remarked on the floristic relationships between these high mountains and those of the Mediterranean region.

The production of the book leaves something to be desired. Typographical errors are common. The reproduction of a number of the black-and-white photographs is fuzzy. The plates are not comparable to the sharp color photographs in Hara's volumes on the eastern Himalayan alpine flora.

In spite of its deficiencies, the book has value in providing some information concerning the vegetation and phytogeographical relationships of a relatively unknown high-mountain region. It definitely is not the last word on the plant ecology of this part of the Himalaya. But it is a start.

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