

# Book Reviews

## Prehistoric Farming Village

**Geobotanische Untersuchungen auf der Feddersen Wierde.** UDELGARD KÖRBER-GROHNE. Steiner, Wiesbaden, 1967. Textband, xii + 360 pp., illus.; Tafelband, vii pp. + 84 plates. DM 238. Feddersen Wierde, vol. 1.

Reconstruction of prehistoric environments is a painstaking and tedious task which requires the careful attention of a variety of experts in many fields besides archeology. This first volume of what is to be a five-volume series details the results of seven years of excavation and study of plant remains from Feddersen Wierde, one of the largest prehistoric village sites on the North Sea coast. Located in the coastal marsh north and east of Bremerhaven, Germany, the site was occupied from about 0 to about A.D. 300 by an agricultural people who raised flax, broad bean, and grains for food and forage for their cattle.

Animal droppings in the vicinity of the large combination barn and dwellings protected and preserved large numbers of plant fragments. Layers are separated by clay and fine sand (*Sturmflutschichte*) deposited by frequent flooding by North Sea storm tides. Körber-Grohne has undertaken a monumental task in attempting not only to detail the chronological succession of plant remains but also to reconstruct the environment of the period by plant sociological comparisons between fossil material and contemporary plant associations. Plant remains include 141 species of native herbaceous plants, 13 species of woody plants, 30 mosses (including subspecies), 11 cultivated plants, and 4 species of wild plants which were probably selectively gathered. Pollen and diatom analyses are utilized to support inferences about proximity to the coast during the time of occupation, salinity of the drainage ditches, and cultivation of coastal marshes. A standard pollen diagram with five radiocarbon dates from Ahlenberger Moor, 16 kilometers northeast of

Feddersen Wierde, indicates the presence of agricultural activity (pollen of *Plantago major*, *P. lanceolata*, and *Triticum*-type) in this area more than 1500 years earlier (younger Bronze Age).

It is not unlikely that inhospitable neighbors forced the Feddersen Wierde people to live under the somewhat marginal conditions of the coastal marshes. Certainly it is probable that these people faced frequent crop failure due to storm-tide flooding. Experiments by Körber-Grohne for two seasons in the marshes outside of the dikes (Aussendeichsmoor near Capperslei) conclusively showed the disastrous effects of immersion of field crops in salt water. An interesting observation on coastal agriculture from these studies is that, despite a vertical difference of only 10 centimeters, field plantings in the *Trifolium repens* zone of the outer marsh usually survive, whereas plantings in the next lower zone (*Juncus Gerardi*) tend to have a fatally high immersion frequency. It is not apparent that the inhabitants of Feddersen Wierde were aware of this plant sociological difference. Color photographs of prehistoric and modern plow furrows are convincing evidence of land tillage. Neither micro-fossil nor chemical analysis of the plow layers (*Ackerschollen*) indicates whether stable manure was utilized for fertilizing the Feddersen Wierde fields.

A large section is devoted to measurements of fruits and seeds of cultivated plants, and these are compared with older and younger finds from western Europe. Intensive study of the histology of stems and bast fibers of flax (*Linum usitatissimum*) indicates that although some thread material was made from flax and grass stems, the shortness of the bast fibers probably precluded their use in textiles, the inhabitants relying instead on hides and wool.

The chief value of this work for North American students of prehistory was summed up by a participant in the Fifth International Quaternary Symposium (Kiel), which visited the site in August 1962. "Excavation is destruc-

tive, and the excavator has a responsibility to record and interpret everything at the site. Once exposed, the information is irretrievably lost." Körber-Grohne's meticulous investigations at the site and his use of contemporary plant associations, pollen, seed, and diatom analysis may well provide a model for similar studies on the North American continent.

Four additional volumes in this series will include the house structures, excavation methods, and cultural history (vol. 2), ceramics (vol. 3), general cultural history of the North Sea lowlands (vol. 4), and the bone remains of Feddersen Wierde (vol. 5).

The book is printed in large format on excellent paper with detailed photographs of plant remains, histological sections, seeds, and pollen in the accompanying Tafelband. It is to be regretted that a firmer binding was not used; this reviewer's copy is already separating from the back.

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## Rice Growers

**Agricultural Change and Peasant Choice in a Thai Village.** MICHAEL MOERMAN. University of California Press, Berkeley, 1968. xii + 227 pp., illus. \$6.

There is an encouraging tendency in recent anthropological writing to grapple with changing community organization as a central problem. To attack the problem, we require quantified variables, temporally and spatially precise references, and generalizations about behavior derived from individualized data rather than from cultural assertions.

Moerman's monograph on village agriculture meets each of these requirements in describing rice cultivation among the 120 households of Lue tribesmen who occupy Ban Ping in north central Thailand (near Chiengrai). Unlike most ethnographers, Moerman rejects contextual description which would "explain" agriculture by tracing its interdependence with other institutions of the community. Instead, he prefers to tell us "everything" about the changing economic variables—land, labor, and capital—that influence the farming decisions of Ban Ping's household heads.

As the inheritors of an ancient irri-

gation system, the ancestors of Ban Ping, who settled in their present habitat a century ago, were unusually blessed. Their small, communally produced rice surpluses were bartered in local markets for other foods and handicrafts. With the arrival of a railroad in Phayao in 1920, the cultivators of Ban Ping gained access to an insatiable cash rice market. Their response was to clear and claim new land resources—most of which was dependent upon flood water. By 1960, village farmers had tripled the hectareage of their original "great field."

Since 1953, exploitation of the cash market through cultivation of new lands by villagers has been facilitated by access to tractors that can be rented from nearby townsmen. Previously, the unirrigated fields were too difficult to plow, but heavy machinery renders them less labor-intensive than the older, irrigated rice fields. Beneath the apparent prosperity of Ban Ping, many institutional changes rooted in the shifting patterns of rice economics can be discerned. Among these are the increasing importance of purchased over inherited land, increasing reliance upon wage labor over exchange labor, and increasing dependence upon resources (tractors, markets, government officials) beyond community control.

But the people of Ban Ping are a transitional peasantry. Their entry into commerce is incomplete. They conceptually separate their lands into those which produce "eating rice" and those which produce "private rice," and only the private rice is for sale. The two sets of fields are spatially discrete, and separate use patterns pertain to each. The "subsistence" fields are farmed cooperatively by family members and neighbors. The "private" fields are farmed commercially with rented tractors and imported labor from remote locations. However, over recent decades, the private fields have tended to become of increasing concern to the villagers, while obligations to the subsistence fields—such as those for maintenance of the communal irrigation system—are met with increasing resentment.

Obviously, the rice farmer of Ban Ping must make decisions regarding the allocation of scarce resources among his separate fields. It is in delineating the factors that enter into these choices, and the manner in which the rice farmer assesses them, that Moerman has made his major contribution. For he succeeds in convincing us that the peasant cultivator in Ban Ping is not

blindly following tradition, but is rationally, with the information-gathering techniques at his disposal, selecting and combining his limited opportunities.

The cumulative impact of shifts in peasant choice operates to produce agricultural change. However, Moerman adds a point in conclusion which, while consistent with an ethnoscientific point of view, finds less favor with this reviewer: "Economic change occurs with the appearance of new standards for making economic decisions and not, as with Ban Ping's tractor, when the outcomes of decisions merely take a modified distribution" (p. 387). This implies that a change in peasant values must precede a change in community

structure. But economic change in Ban Ping preserves the adaptive balance between the village, its physical environment, and its social environment of extracommunity relations. Shifts in this adaptive pattern are signaled by modifications in the distributions of decisions made by the village farmers. Community structure may sustain irrevocable change without a prior change in community standards. The tractor may revolutionize agriculture in Ban Ping, and with it the life of the community. The villagers need not *like* the tractor before this can happen.

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## Morphogenesis and the Progress of Botany

**Essays on Form in Plants.** C. W. WARDLAW. Manchester University Press, Manchester, England; Barnes and Noble, New York, 1968. xiv + 399 pp., illus. \$8.75.

Throughout a distinguished career devoted to plant morphogenesis, C. W. Wardlaw has frequently taken time out from (perhaps time within would be more apt) his specific investigations to reflect upon the wider significance of recent developments in the biological sciences and to comment upon the present direction of botanical research and the direction which, in his view, it ought to be taking. In his research papers, in his books, and in lectures and essays devoted specifically to these reflections, he has stressed the importance of organization and pattern in organisms as the central question for biologists. At the same time he has urged the unification and integration of diverse fields of botany in an assault upon this problem and warned that unless the attack is channeled along avenues of sound and perceptive scholarship it will inevitably be repulsed by the complexity of organismal phenomena. It is his contention, moreover, that the study of morphogenesis, the development of form, is, by its nature, the logical discipline to draw together the diverse fields of botany, the structural and the functional, the phylogenetic and the genetic, indeed even the systematic, along with biochemistry and biophysics, which are all ultimately concerned with organization but have struggled with it in relative isolation.

This, in a few words, sets forth the theme of *Essays on Form in Plants*, a collection of 30 previously published

papers selected by the author to illustrate, as he says, something of the progress in his general experience and thinking which went on as an integral part of his experimental investigations, and accompanied by an introduction and a concluding essay on "Perspectives in morphogenesis" written for this volume. The collection in no sense represents a cross section of the author's scholarly work. The research papers which have been included are several in which a new approach or a new concept is tested for the first time; for example "Phyllotaxis and organogenesis in ferns" [first published in *Nature*, vol. 161, p. 167 (1949)], in which the concept of growth centers and fields as applied to phyllotaxis was explored experimentally. For the most part, however, the essays are reviews, commentaries, and book reviews in which the emphasis is upon synthesis, evaluation, and criticism. Readers will be pleased to find two articles dealing with Turing's diffusion-reaction theory of morphogenesis and will certainly benefit from "Process and record: aspects of botanical science," a little-known article which analyzes the decline of comparative morphology but points to a hopeful future for morphology if investigation of it is pursued along developmental lines as a synthetic approach to evolution.

This volume is a valuable addition to the literature of the biological sciences. Wardlaw's sense of, and knowledge of, the historical adds interest and authority to his predictions and recommendations for the future development of plant science. For those who appreciate the