BOOK REVIEW

The Origins of Agriculture and Settled Life. Richard S. MacNeish. Norman: University of Oklahoma Press, 1992. Pp. xix, 433. $75.00. ISBN 0-8061-2364-8.

No one has dug more assiduously in more agricultural homelands than Richard MacNeish. Given MacNeish's experience, and his creative and original mind, it is not surprising that he has produced a benchmark work on agricultural origins.

This book is not a full review of the "origins of agriculture" literature, though MacNeish does provide a 38-page bibliography. Rather, the book represents the model of agricultural development that MacNeish has been developing while excavating early agricultural sequences in Peru, Mexico, and the American Southwest.

MacNeish is too experienced to rely on one or two factors. He stands at the opposite end of the spectrum from the simplistic "population pressure" model of Cohen (1977) or Rindos's reduction of domestication to a virtually accidental biological side-effect of plant exploitation (Rindos 1984). MacNeish integrates these ideas with many others.

MacNeish allows four primary areas: Peru, Mexico, the Near East (the earliest in time), and north-central China. This parsimonious view has recently been independently endorsed by Blumler (1992), who thinks there might have been only two (Mexico and the Near East). By contrast, Cohen's and Rindos's models would both predict randomly distributed and quite frequent and rapid transitions to farming. MacNeish has pointed out that, in all primary areas, domesticated crops produced only about 5% of the food supply for literally thousands of years. People forced to farm because of hunger would change much more rapidly than that—or else starve to death.

At the end of the Pleistocene, megafauna became extinct and people had to turn to smaller food sources. In certain parts of the world strongly seasonal climates emerged. In such areas, affluent hunting groups became what MacNeish calls "destitute foraging bands." It seems that these bands were not really destitute; they had to shift from mobile hunting to more local seasonal-round cycles and macroband/microband alternation. They also found plants that are easy to domesticate: annuals or short-generation perennials that have many edible seeds or tubers and are genetically plastic. In such areas, primary agriculture emerged, if there was intensive contact between groups, and thus sharing of ideas and foods.

Only four places in the world appear to meet all these criteria. Much of the world was too homogeneous, or conversely, had such rich variety in one spot that people did not feel a need to domesticate. I believe MacNeish would agree with earlier authors that places like southern South America and southern Africa are culs-de-sac, lacking the necessary intensive contact between groups.

Secondary domestication took place in areas nearby, where people could satisfy their immediate needs without moving seasonally. They had less incentive to develop and intensify a resource that could be stored and moved. Population increase in the more circumscribed of these spots—notably river valleys in dry areas—would lead to resource overuse, and thus to borrowing agriculture. Readers will be reminded of Carneiro's "circumscription hypothesis" (Carneiro 1970), as well as of Mark Cohen's work in Peru (Cohen 1977).

Tertiary domestication is yet another process. This involved a moving fringe of agriculture expanding slowly over the landscape. The landscape is thus predicted to be relatively homogeneous. It will also have fewer easily domesticable plants—i.e., it will probably be a forest or a shrub desert. Europe is the obvious type case, but something similar seems to have happened in Japan, southwestern and eastern North America, and other areas. This has previously been explained as natural diffusion of a good idea, or as expansion of one population group—a theory argued for Europe by Cavalli-Sforza and associates (Ammerman and Cavalli-Sforza 1984), but hardly defensible for any of the other areas. (Consider the linguistic diversity of the American areas.) MacNeish sees it as a different process; sedentary groups built up population, borrowed a few domesticates, traded food, built up more population, and had to intensify further.

In all three situations, a feedback loop emerges once people are reliant on agriculture for a significant percentage of their food: their population grows, they are less able to pick up and move, and they are more skilled at plant breeding

and domestication. Intensifying agriculture becomes a more and more persuasive option. MacNeish tests the evidence against available world data, including some 50 key sequences from key areas. He predicts that more sequences will only strengthen his case.

Some footnotes to this theory are in order. First, in all four of these areas, the earliest known domestication coincides with the arrival of warmer and wetter climates that would allow annual plants to expand. In the Pleistocene, any good Neoclassical microeconomist advising a hunting band would have told them to get more mobile and invent better hunting gear—the payoff lay in getting more meat with less effort. This is exactly what they did. In the post-Pleistocene, with game drastically reduced and plants increasing, the advisor would recommend diversifying the portfolio and looking to growth stock (sheep and goats, guinea pigs, llamas ...) and grain futures. This is what happened. We need not invoke population pressure—common sense, perhaps glorified as "optimal foraging theory," will do.

It is well to remember, also, Sauer's point that the original domesticators must have been affluent enough to try a process that is highly chancy and slow to pay off (Sauer 1969). New processes take time to develop, failures are typical, and those thousands of years when cultivation provided only 5% of the food are easy to understand. The same phenomenon, today, explains the fact that almost all agricultural research and innovation is in the richest nations.

The importance of MacNeish's "intensive interactions" among the primary producers also deserves more attention—as MacNeish has said in other papers (e.g., MacNeish 1977). People can find something to domesticate almost anywhere, and there are many diverse habitats that require humans to move around. More critical is a source of ideas and some pressure to use them. Trade provides the ideas and some incentive. People would want to raise crops near the house to have them easily available for trade. This may explain why so many early cultigens were portable luxuries such as chile peppers, bottle gourds, and tobacco. Raid also provides incentive. It makes people desire to raise all their food within a defensible perimeter. Warfare is common in traditional societies. It keeps population growth rates down, and creates pressure for food concentration and storage. Thus it can substitute for population pressure as a source of strong incentive to intensify agriculture. Surely, it is no accident that the four primary centers and most of the secondary centers are in areas that have always been "crossroads of continents."

MacNeish's model receives independent verification from recent findings in China (Chang 1986; Ping-ti Ho 1988) and the Near East. In China, some of the questions MacNeish asks of the data have been resolved recently, and MacNeish's model wins. The earliest agriculture known is in an area of dry valleys and lusher mountains, with many ecozones not quite accessible from one site (personal observation). In the latter case, McCorriston and Hole (1991) have recently argued for the Jordan Valley as the origin point, but most of the earliest crops find their closest living relatives in the area of the Turkey-Syria-Iraq tri-point (Giles Waines, personal communication). Either areas fits MacNeish's model for the Near East.

The main problem with MacNeish's book is the high number of errors. The proofreading, editing, and production of this book do no credit to the University of Oklahoma Press. K.C. Chang's *The Archaeology of Ancient China* appears as *The Archaic of Ancient China,* and is cited to a long-superseded edition. Scientific and common names in the tables of cultivated plants are very frequently miswritten.

Three controversial matters should be mentioned. First and least important, MacNeish separates teosinte from true "corn" (p. 110), unlike most contemporary scholars. Second, MacNeish credits Europe with spelt, millet, and apples—all quite possibly domesticated in Asia. Third, MacNeish is famous for his acceptance of very early dates for the entry of humans into the New World. This does not affect his arguments in this book, but more than a few archaeologists will be put off by the background sections of the chapters on New World areas.

This book provides the best model yet published for the origins of agriculture. Its author's formidable experience with the data makes him worth the serious attention of anyone interested in the question.

LITERATURE CITED

AMMERMAN, ALBERT, and L. CAVALLI-SFORZA. 1984. The Neolithic Transition and Genetics of Populations in Europe. Princeton University Press, Princeton, NJ.

BLUMLER, MARK A. 1992. Independent inventionism and recent genetic evidence on plant domestication. Economic Botany 46:98–111.

CARNEIRO, ROBERT. 1970. A theory of the origin of the state. Science 169:733–738.

CHANG, KWANG-CHIH. 1986. The Archaeology of Ancient China. Yale University Press, New Haven, CT.

COHEN, MARK R. 1977. The Food Crisis in Prehistory. Yale University Press, New Haven, CT.

HO, PING-TI. 1988. The origins of Chinese agriculture. Paper presented at the Fifth International Conference on the History of Science in China.

MACNEISH, RICHARD S. 1977. The beginning of agriculture in central Peru. Pp. 753–810 *in* Origins of Agriculture. Charles Reed (editor), Mouton, The Hague

MCCORRISTON, JOY and FRANK HOLE. 1991. The ecology of seasonal stress and the origins of agriculture in the Near East. American Anthropologist 93:46–69.

RINDOS, David. 1984. The Origins of Agriculture. Academic Press, New York.

SAUER, CARL O. 1969. Agricultural Origins and Dispersals. MIT Press, Cambridge, MA.

E.N. Anderson
Department of Anthropology
University of California
Riverside, CA