

pagan implications, was institutionalized by the ordinance of *Shaykh Ahmadu ibn Hammadi* early in the nineteenth century. It is this ordinance which defined the highly regulated migratory patterns of the Islamic Fulani.

The social complexities, livelihood emphases, and territorial expansion of the Dogon are presented with an authority reflecting the author's well-documented familiarity with this enigmatic people. The monograph also deals with a medley of sedentary, agricultural tribes of diverse provenance, including an excellent analysis of the Hombori district by Jocelyne Marie and descriptions of three Fulani groups: the Dialloubé, the Djelgobé, and the Foulankriabé. Jérôme Marie's treatment of the Foulankriabé of Hombori is particularly thorough and provides important insights into processes of social change in the Gourma.

Although Professor Gallais's view of the tribal societies who occupy the Gourma is sympathetic, one might wish for the presence of more indigenous opinion and perception in the study. Similarly, the monograph would have profited from a more systematic introduction to the history of the region and from a more generous use of non-French sources. The Gourma was, after all, appended to a succession of remarkable empires and states, among them Ghana, Mali, Songhai, and Segu. It was also the terminus of important Berber trans-Saharan routes established in Carthaginian times, influenced by east-west movement along the Sahelian route of Islamic pilgrimage, and was greatly influenced by diverse Muslim brotherhoods and by such nearby centers of commerce and scholarship as Djenné and Timbuktu. Remnants of the region's past variously reside in ancient hydraulic works similar to those of western Arabia and the desert realm of the Garamantes, and in the brick architecture introduced from Granada via Makkah by Abu Ishaq as-Sahili following the memorable fourteenth-century *hajj* of the Malian emperor, *Mansa Kankan Musa*. As is so often the case with western considerations of the Sahel, one is left with the incorrect impression that the written history of the Gourma dates from the passage of Heinrich Barth in the mid-1800s. Neglected are many valuable earlier sources dealing with the region: Wabih ibn Munabbih, al-Fazari, al-Mas'udi, al-Bakri, az-Zouhri, al-Idrisi, Ibn Battutah, Ibn Khaldun, the Venetian Alvise Ca'da Mosto, Leo Africanus, Ahmad Baba, Mahmud Kati, 'Abd ar-Rah-

man as-Sadi, Olfert Dapper, the Scottish surgeon Mungo Park, and others. The details of settlement, social organization, and livelihood described by many of these authors would have lent context to Professor Gallais' more contemporary discussion.

Despite its various omissions and somewhat uneven synthesis, Professor Gallais and his principal collaborators, Jocelyne and Jérôme Marie, have compiled an extremely useful monograph. The study is well-written, unusually well-illustrated, and contains a wealth of specific information. It is, perhaps, the most valuable regional study dealing with the Sahel to appear in recent years.

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The Food Crisis in Prehistory: Overpopulation and the Origins of Agriculture.

Mark Nathan Cohen.

Yale University Press, New Haven, 1976. x + 341 pp., index. \$15.00.

Reviewed by Karl W. Butzer

CULTURE historians and archeologists have long been intrigued with the nature of innovation in the prehistoric record, and much recent attention has been given to the cause and effect relationship between population growth and technology. Cohen is critical of the increasingly popular homeostatic model that regards human populations as systems that seek and maintain equilibrium. Instead, he prefers an alternative mechanism that emphasizes the inherent growth of such systems, and would see the first colonization of new environments and particularly the origins of agriculture as a response to steady population growth and stress. He argues that human societies have (p. 16) "grown throughout their history and have encroached progressively on their resources," so requiring "continuous development of new

adaptive strategies." Between 15,000 and 8,000 years ago the potential for territorial expansion was exhausted; population growth favored dietary readjustments, specifically a shift from desirable but scarce large game to more plentiful but less palatable secondary resources, such as grains and tubers, that increased the supply and reliability of edible calories. This might explain the nearly simultaneous emergence of agriculture on a world wide scale. Cohen's argument is first developed on theoretical and ethnographic lines, and then elucidated by detailed surveys of the Old and New World record.

The book represents a well-argued and documented thesis that, on the available data base, can neither be proven nor disproven. Many of the trends that Cohen diagnoses are debatable, or have at least equally good alternative explanations to the ones he favors. One fundamental problem is the assumption that the intellectual capacity and cultural potential of humankind have been essentially constant during the last two million years. The basic cultural system common to all modern peoples was established less than 35,000 years ago. The accelerating technological diversification and spatial differentiation evident in the Pleistocene archaeological record cannot be cited as evidence for mounting, global demographic stress. It did involve increased population levels but, in its broad lines, was primarily due to an intricate feedback between biological evolution and cultural innovations. Furthermore, environmental changes appear to have triggered cultural responses (e.g., in subsistence-settlement patterning) that favored biological evolution, which in turn affected the biological capacity for culture.

Under careful scrutiny the prehistoric record shows little of the continuous, consistent, almost inexorable change repeatedly claimed by Cohen. So, for example, anatomically modern *Homo sapiens sapiens*, possibly making composite hafted tools, was present in South Africa as much as 60,000 years earlier than the demise of the conservative Neanderthals (*Homo sapiens neanderthalensis*) of western Europe. The African lithic industry in question remained confined to certain mesic environments and then disappeared, with no evidence of expansion into further ecozones. Another major, persistent ecological disjunction can be identified between ca. 30,000 and 20,000 B.P. Traditional macro-lithic industries, characterized by a substantial

proportion of thin "blades," persisted in the relative isolation of the semiarid interior and west of southern Africa, while a quite distinct techno-complex with a high incidence of microliths, few formal tools, and only rare blades became established in the mesic montane zone. These instances show the importance of ecological adaptations in prehistoric colonization, from the earliest times. A related issue is that resources must first be perceived and an adequate technology devised before exploitation can begin: population pressures may play a role but several other processes, including diffusion, may well be more instrumental.

For the critical transition from hunting-gathering to agriculture ca. 15,000–5000 years ago, there are several documented cases. In the Nile valley intensive, broad-spectrum gathering activities were practiced by the relatively numerous bearers of some 5 distinct lithic industries (ethnic groups?) ca. 18,500–11,500 B.P., with significant intergroup warfare. Yet agriculture was not quite achieved, in fact resisted until after 7000 B.P., i.e., 1500 years later than in the Saharan Highlands. Some 500 years after the building of the pyramids, about half of the alluvial lands of Egypt were still used for pastoral activities, and maximum population prior to the nineteenth century was only reached in response to the efficient entrepreneurial system of the Ptolemies in Graeco-Roman times. In middle-latitude Europe, hunters of gregarious megafauna gradually shifted to more mixed economies, with greater emphasis on aquatic foods and low biomass solitary game during the environmental transition from tundra grassland to forest ca. 13,000–9500 B.P.; three millennia later these peoples then began to respond to intrusive agriculture by selective acculturation and, ultimately, assimilation or submergence. A degree of parallelism can be cited from mesic parts of South Africa where open habitats became scarce ca. 9500–7500 B.P., and where the new socioeconomic system remained remarkably stable until the introduction of herding during the last two millennia.

These Old World examples serve to show that there were significant, long-term spatio-temporal disjunctions, that trajectories were unpredictable, that change was not progressive but episodic, and that there have indeed been relatively long (3–5 millennia) periods of socioeconomic quasiequilibrium. It also seems that there are more exceptions than examples of any

processual law, raising the persistent problem why areas with the same ecological determinants and potential demographic variables developed along quite different lines, e.g., the emergence of hydraulic civilizations on some suitable floodplains but not in others.

I would not wish to minimize demographic factors, but these examples show that several other critical variables are part of the equation. There is little doubt that demographic changes accompanied and, in at least some cases, followed upon changes in technology or subsistence-patterning or both. But we have yet to identify an instance where demographic pressures actually preceded shifts in prehistoric technology or settlement. Cohen's fourteen archaeological criteria of demographic change (pp. 78-83) are based on observed, i.e. ongoing or completed, socioeconomic changes, so that he cannot hope to prove *prior* demographic stress on archaeological criteria.

These contrary views do not detract from the value of Cohen's book, which should and will be read by professionals and students interested in human ecology. It is a thoughtful and stimulating study that serves to caution against facile applications of equilibrium theory. In fact, I see no reason why demographic stress should not play a major role in the positive feedback impulses that promote episodes of rapid change linking successive homeostatic plateaus.

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Land Tenure and the Rural Exodus in Chile, Colombia, Costa Rica, and Peru.

R. Paul Shaw.

The University Press of Florida, Gainesville, 1976. 180 pp., bibliog., figs., index. Center for Latin American Studies, Monograph 19. \$11.50.

Reviewed by Donald W. Jones

IN recent years rural to urban migration in developing countries has interested numerous

researchers who have paid far more attention to the attractions of the cities than to rural conditions which on their own may turn inhabitants into migrants. Shaw's purpose is to examine what he believes to be a major force at work in rural areas of Latin America that, independently of urban "pulls," encourages rural to urban migration. His thesis is that conditions providing a powerful push for rural to urban migration occur when: 1) there is rapid, rural population growth; 2) technological progress is slow or nonexistent; and 3) land tenure arrangements and a structure of land distribution severely restrict income opportunities of peasants who are landless or small-holders.

Shaw's argument is as follows. In a latifundia-minifundia system of land holding, sixty to ninety percent of farm operators hold from one-half percent to five percent of the land, while one-half percent to five percent of the operators hold sixty to ninety percent of the land. For the small holders, off-farm employment opportunities are few, and sharecropping and leasing arrangements are contractually very unstable. With rapid population growth and the inability of new labor force entrants to occupy additional land, there is little or no opportunity to do anything other than go to the city. Shaw notes the additional incentives of cumulative soil deterioration and crop booms and busts.

He presents satisfactory evidence from censuses of agriculture on the land-labor ratios in the latifundia-minifundia system and on rural population growth rates. He cites references which, he says, indicate the instability of sharecropping and leasing contracts, but he is content merely to describe the situation as unstable without attempting to measure some degree of stability or instability. This alternative would have required something other than aggregate data. To buttress further his position that the discrepancies between man-labor ratios on latifundias and minifundias involve a gross misallocation of national resources in agriculture, Shaw presents figures, again from censuses of agriculture, showing that a vastly greater percentage of cultivable land is actually cultivated on minifundias (43% to 80%) than on latifundias (4% to 17%). These figures should be treated more circumspectly than they are by Shaw, for the classification of the land's arable potential was the decision of the individual census enumerators. Arnold Bauer (*Chilean Rural Society from the Spanish Conquest to 1930*,

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