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Egyptian agricultural scene. (Photo Helen/Nigel Strudwick.)

Some studies of the transition to agriculture are distant from the underlying change in diet. The cultural-philosophical approach to the change to farming and food production is discussed by CHRIS SCARRE (University of Cambridge), who revisits the ideas and work of Jacques Cauvin who recently died. Was agriculture a single global phenomenon? Cauvin focused on the development of sedentism and food production in the Levant and equated the Neolithic Revolution with the foundations of modern human society, culture and mentality. This is a viewpoint that has been energetically taken up by some Post-Processual thinkers. Chris Scarre writes on 'Jacques Cauvin and the origins of agriculture':

'In a recent issue of *American Antiquity*, Richerson, Boyd & Bettinger pose the key question why agriculture did not emerge during the Pleistocene (Richerson *et al.* 2001). They present their argument in the form of two propositions: that agriculture was impossible during the last Glacial (owing to climatic instability), and that in the long run, agriculture was compulsory in the Holocene. Their explanation is framed at the broadest geographical and chronological scale, and comes down heavily in favour of climatic change — notably the abrupt transition from Glacial to Holocene — as the driving factor behind intensification. The search for common themes or common factors at such a general scale is of course entirely appropriate where agriculture is viewed as a global phenomenon. There are, however, alternative perspectives, which consider specific regional or local trajectories as the more relevant scale of analysis. We might, for instance, question whether agriculture is indeed a single phenomenon, or rather a series of individual instances of a general trend towards intensified interactions between modern humans and their food resources (e.g. Higgs 1972; 1975; Rindos 1984). The reified concept of "agriculture" on which many traditional accounts are predicated is as much a target for legitimate critique as is the Neolithic or the state. Early agricultural systems involved different species, different technologies and environments, and were associated with a diversity of social and economic regimes. Yet any such project to deconstruct domestication would run counter to other recent approaches which seek to understand the origins and spread of domesticates not in terms of economic adjustment but as a cognitive or symbolic shift which redefined human self-awareness.

'A leading proponent of this approach was French archaeologist Jacques Cauvin, who died late last year. Cauvin spent his professional life working on early agricultural sites in the Levant, and was a leading figure in the important excavations at Mureybit in Syria. His observation that innovations in symbolism prefigured and accompanied the Neolithic transition was a major influence on Hodder's *The domestication of Europe* (1990). What Cauvin envisaged was nothing less than a change in human cognitive and symbolic outlook, that preceded and made agriculture possible. The case was set out most fully in *Naissance des divinités, naissance de l'agriculture* (1994), which appeared in English translation six years later under the title *The birth of the gods and the origins of agriculture* (Cauvin 2000). In essence, his thesis argues "that it is actually in the Neolithic Revolution that we find the roots of the present state of the human race, not only in its domination and exploitation of the environment, but also . . . in the very foundations of our culture and mentality" (Cauvin 2000: 3).

'An important influence on the development of Cauvin's ideas was the discovery of Ain Mallaha in 1955 by Jean Perrot. This was a "village of hunter–gatherers" that defied the then-dominant model that sedentism should follow agriculture: a small settlement of five or six

sunken-floored round houses with storage pits and heavy ground stone tools designed for pounding and grinding. Such Natufian settlements developed all the technology that was needed for farming but continued to rely on wild resources. It was in the following period — the Khiamian — that the great change occurred, and this was not an economic, climatic or technological adjustment, but a symbolic one. It was marked by the appearance of female figurines and by the placement in houses of aurochs bucrania, both themes that recur in later contexts such as Çatalhöyük. For Cauvin, the Woman and the Bull were representations of deities, and revealed a new religious awareness that underlay and indeed inspired the development of domestication in the following PPNA phase. Thus the Neolithic Revolution provides "the clear demonstration of the fact that man could not completely transform the way he exploited his natural environment, his own settlements as much as his means of subsistence, without showing at the same time a different conception of the world and of himself in that world" (Cauvin 2000: 220).

'The primacy which Cauvin accords to the revolution of symbols and a new religious understanding are worlds away from traditional ecological or demographic models for the origins of agriculture. One wonders, perhaps, how well they would work as a general explanation, applied to other agricultural origins in other areas. We may, furthermore, pose the same question with which we started: if modern humans had already been in existence for tens of thousands of years, why did these changes not occur earlier? There is a mysticism about Cauvin's argument which invites caution. Hodder's interpretation of the Neolithic transition gives symbolism a rather different and more concrete role. He notes how at Çatalhöyük and other East Mediterranean sites, "human death, skulls, vultures ands wild animals were brought into the house. . . . animal death is linked to human death, 'male' dangers to 'female' dangers. This juxtaposition enhances the prestige of the social and cultural order which confronts and controls the agrios [the wild]. It identifies the domestication metaphor as the main mechanism for social control" (Hodder 1990: 294). The emphasis here is on the house as the centre and symbol of domesticated space. Anthropologist Peter Wilson takes a similar approach, arguing that as houses preceded agriculture, so it was houses that domesticated people before people domesticated plants: "the domestication of plants and animals follows the domestication of human beings and is inspired by it" (Wilson 1988: 3). Yet, as is well known, sedentism did not precede plant domestication in key areas of the world such as Mesoamerica (e.g. Pearsall 1995).

'The notion of the Neolithic as a symbolic revolution brings Cauvin close to current thinking on the Neolithic of northwest Europe. There is little evidence in this region, however, that a cognitive or symbolic change preceded the adoption of agriculture. In northwest Europe, the primacy given to the cultural and symbolic dimension of the Neolithic is one of *significance* rather than *chronology*. These societies at the very outset of the Neolithic appear to have engaged in a new project of enculturing the landscape, constructing monuments of earth, timber and stone that indicate a changed perception of the world. In many areas evidence for substantial permanent residential structures is slight, and life-styles may have remained relatively mobile for many generations. Furthermore, a number of authors (e.g. Bradley 1998; Thomas 1999) have sought to play down the significance of cereal cultivation in early Neolithic societies, a revision which would focus the spotlight all the more sharply on the Neolithic transition as a cultural or ideological phenomenon.

'Whether such interpretations will stand the test of time remains to be seen: palaeodietary evidence from northwest Europe is increasingly supporting the alternative argument, that the beginning of the Neolithic was marked by a relatively abrupt and significant switch to cultivated plants (Schulting 1998). Whatever the outcome of this debate, the importance of an associated symbolic shift is beyond question. In the final analysis, indeed, both Cauvin and Richerson may be held to be right, the difference being one of scale. Viewed in the broadest perspective, it may be entirely appropriate to consider agriculture the outcome of a "natural" evolutionary process operating at a global level, waiting only on the development of modern humans and suitable climatic conditions. Yet domestication and the manipulation of plants and animals were also embedded in regionally-specific social and ideological contexts which first made them possible. Furthermore, there is little question that domestication

was not just an economic process but that, as Cauvin remarked, it introduced concepts and ideas with which altered human awareness and inspired new cosmological and ontological understandings.'

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LEE NEWSOM (Penn State University) provides a more detailed analysis of the regional scale of analysis. She comments on the developments of research in early Agriculture in the eastern and central United States of America, where surprising evidence has demonstrated the origins of important crops, such as gourds, sunflowers and chenopodium, in several different centres. Problems of taxonomy, pollen data, dating, and reliance on present day specimens to understand ancient samples are discussed. She writes:

'Eastern North America has been recognized as an independent centre of plant domestication, where the timing and trajectory of domestication and the circumstances behind food producing economies are fairly well understood. I emphasize new developments and recent controversies concerning this region.

'Among the earliest plants from archaeological sites in eastern North America are gourds of the genus *Cucurbita*. Once characterized as exotic domesticates from Mexico, these were ultimately recognized as part of the native flora. That they derive from indigenous wild stock is supported by biosystematics, genetic, and isozyme data, as well as seeds from north Florida greater than 12,000 years of age. Together this evidence demonstrates a lengthy independent history in eastern North America (Decker-Walters *et al.* 1993; Newsom *et al.* 1993; Wilson *et al.* 1992). An increasing number of early to mid-Holocene cucurbit identifications have been reported and Fritz (1999) suggests they represent the earliest cultivated plants in the region. Of particular interest is whether *Cucurbita* identified from Maine and Pennsylvania might be an indication of the former natural range of the genus, or signifies gourds cultivated beyond that range. The identity of the early gourds, i.e. the wild ancestor of later domesticated *C. pepo* ssp. *ovifera* in the region, has been linked to ssp. *ovifera* var. *ozarkana*. Recently, there has been a call also to reconsider ssp. *fraterna* (Sanjur *et al.* 2002) of northeast Mexico as the progenitor. I suspect the situation will prove complex, with perhaps the Florida *Cucurbita* as part of gulf coastal developments (possibly including northeastern Mexico), separate from var. *ozarkana* and the Phillips Spring and other mid-continental archaeological gourds.

'Aside from gourds, at the epicentre of agriculture origins is a suite of weedy annuals variously cultivated and domesticated by at least the 3rd millennium BC in the Midwest (Fritz 1994; 1995). The earliest of these appear to have been sunflower (*Helianthus annuus* var. *macrocarpus*) and sumpweed (*Iva annua* var. *macrocarpa*), followed somewhat later and in some places by chenopod (*Chenopodium* sp. [considered *C. berlandieri* ssp. *jonesianum*]). By this time there is considerable evidence that *Cucurbita pepo* was domesticated and cultivated widely as a food or container crop. Less clear is the status of other plants — erect knotweed (*Polygonum erectum*), little barley (*Hordium pusillum*), maygrass (*Phalaris caroliniana*) — among others. However, the conditions of their occurrence and other criteria suggest they were part of this emerging horticultural tradition. All of this interaction represents indigenous developments and innovations, long recognized as a local trajectory of domestication comprising an independent centre of domestication and agricultural origins (Smith 1992). The later appearance and spread of the tropical cultigen maize, among others, has been clarified with new AMS dates of particular specimens together with isotopic