

CHAPTER 6. AGRARIAN SOCIETIES

I. Introduction

A. *Linking Technology and Social Structure*

The story of agrarian societies continues the themes of the last two Chapters on horticulture and pastoralism. *With the continued development of agricultural technology came associated trends in the development of other aspects of culture.* Recall that the chief results of plant domestication were (1) greater production per of unit land, (2) higher population densities and sedentary settlements, (3) and increases in material wealth, including stored food and luxury items. Associated with these technical and demographic changes was a substantial increase in the social and political complexity of societies. Large scale military defense and redistribution became more important as wealth increased, the local reliability of subsistence declined, and some specialists removed themselves from personal participation in food production.

As agrarian technology developed, the potential for substantial gains in per capita production arose as more sophisticated technology was put into farmers' and artisans' hands. Gains in production per unit of land and per unit of human labor have somewhat different implications for culture core traits, as we have already noted.

The tragedy of agrarian societies is that this potential was not generally realized. A combination of exploitation by elites and population growth tended to erase any gains in well-being for most cultivators. This is essentially the argument of T.R. Malthus, whose famous ideas we will examine in detail, especially in Chapters 9 & 15. Many have gone so far as to argue that civilization is a big mistake, that people were happier on average in pre-state level societies. This hypothesis is hard to test, but it is clear that the average person did not make spectacular gains in personal well-being from the growth of agrarian societies. Agrarian states do permit larger numbers of people to live, and some would count that as a gain itself.

Have agrarian societies really removed environmental constraints? Another important theme developed by Lenski and Lenski (1982) and others is that the variations among agrarian societies seems to have had less and less to do with environmental variation and more and more to do with technical and sociopolitical evolution. Humans seem to be winning more and more independence from direct environmental controls over human behavior through the culture core. You should be skeptical of this claim. It is true that some of the variation between societies living in different environments is reduced, but perhaps en-

vironmental effects are only being made internal to these larger and more complex societies rather than being eliminated. Agrarian societies are typically large in size and internal redistribution and external trade tend to reduce the society-wide impact of local environmental differences. Thus the neat geographical correlation between sociopolitical form, demography, and the like, nicely showing how culture core traits are connected to environment, is lost. However, the structure of economic life and even of political structure still strongly reflects environment, albeit through more complex causal pathways. The famous French historian, Fernand Braudel (1972), made this point in his weighty tome "*The Mediterranean and the Mediterranean World in the Age of Philip II.*" Braudel takes almost infinite pains to show how the details of Mediterranean geography, climate, soils, and so forth affected things beginning with everyday life and working up to the policies and fates of empires like Philip II's. (Philip II was the Hapsburg heir to Spain and the Low Countries (etc.), ruling from 1556 to 1598. He ordered the Spanish Armada to attack England in 1588 in his most famous defeat.)

B. Some Examples of Agrarian Societies

Our sample of agrarian societies is quite large, because so many of them have maintained written records, and have persisted until quite recently. Even today, poorer nations typically categorized as "Third World" or "Less Developed Countries" (LDCs) are generally agrarian societies, albeit with variable admixtures of industrial technology. Geertz (1965) gives a classic account of one such society, Indonesia. China, India, Peru, and many others retain much of the technology and other culture core features of agrarian societies. The description of such societies comes largely from historians, although anthropologists, sociologists, economic historians, and others have made major contributions to understanding such systems. What we mainly lack is adequate samples of the very early agrarian societies in Western and Eastern Asia. We suppose that the better-known advanced horticultural societies, such as the American advanced chiefdoms, city-states (e.g. Aztecs) and one conquest empire (the Incas), are reasonable rough models. Of course, the archaeology of agrarian societies in Western and Eastern Asia is very good, and written records start only a few centuries after the transition from simpler societies to states (the Homeric tales and the Old Testament are good examples).

While the amount of data on agrarian societies is quite impressive, one can overestimate its quality. Brown (1988) notes that even most literate societies write very little critical history or commentary on contemporary affairs. Most of what is written down, even in quite literate societies, is so mythologized as to be nearly useless. Europe and China are exceptions, but even in these cases it depends upon the time period. Reliable documentary

sources for India, to mention a classical agrarian civilization, are almost absent, for example. You've all heard the maxim that "Those who forget history are condemned to repeat it." The trouble is, even relatively well documented "lessons" of history, such as the decline and fall of Rome, are rather poorly understood and offer only rather dim and unreliable lessons (see Bowersock in Yoffee and Cowgill, 1988).

II. Technology

A. Plows and Non-Human Energy

The defining trait of agrarian technology is the presence of plows and draft animals. Without forgetting the fact that some advanced horticultural societies, such as the Inca Empire, became fairly sophisticated without the plow, there is a basic innovation involved in the plow. For the first time tools could be operated with non-human labor. Thus, the returns to the labor of a human worker could be substantially multiplied by substituting the relatively great power of the beast for the relatively puny powers of people. Other technological sophistications increase human output (compare working with a badly designed versus a well designed hammer), but no single technical principle has proven quite as important as the idea of substituting non-human power for human labor. Extending this principle to ever more subsistence tasks ultimately produced the industrial revolution.

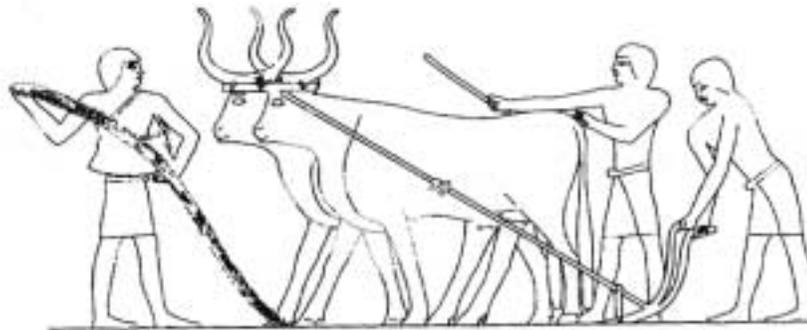
B. Variety and Improvement

Plows were first used in the Middle East around 5,000 years ago (5,000 bp). The first plows were simple "scratch plows" whose physical effect on the soil was just to stir the top 10-15 cm of soil to prepare a seedbed. These plows were pulled by a very simple yoke arrangement as illustrated in Figure 6-1. In light dry soils, these plows are quite sufficient (the modern disc harrows so commonly used in California operate on the same principle) to aerate the soil, provide a barrier to the evaporation of soil moisture, and destroy weeds. Permanent fields can be maintained much more easily as a result of plowing. In semi-arid country, such as South-Western Asia, California, or the Peruvian Highlands, scratch plowing is all that is required to maintain permanent fields.

A second revolutionary technical development along the same lines was the development of wheeled, animal-drawn cartage. Now products could be moved much greater distances, and the redistributive functions of political authorities and private trade expanded. Military uses of the new animal mobility were noticed early on. First, there were carts to haul supplies and booty, later chariots enabled development of a cavalry arm in military organizations.

Societies based on scratch plow technology still exist, for example in the Peruvian

Figure 6-1. Early Egyptian ox-drawn plow (about 2700 B.C.). Note the primitive method of harnessing the animals - a simple bar attached to the horns. (Lenski and Lenski 1982:170)



highlands. People there adopted the ox-drawn scratch plow from the Spanish, and still use it to cultivate the bulk of Peru's arable land. The pre-Columbian horticultural foot plow is still used extensively as well. It would be interesting to compare this technology in terms of labor productivity with the horticultural technology that is still used there as well. We suspect that simple plow cultivation perhaps doubles labor productivity.

C. The Moldboard Plow, an Example Of Continuing Technological Evolution

The continued technological development of agrarian societies can be illustrated by the evolution of the plow. The main subsequent innovation in the West (before industrialization) was the heavy moldboard plow. These are the tools we think of as plows proper, with a share and coulter¹ to cut sod and moldboards² to turn the cut slice of earth rather precisely upside down. Such plows help return downward-leaching nutrients to the surface, and are better at keeping heavy soils free of weeds in damp climates, where the mere stirring of the scratch plow does insufficient damage to root systems. Anyone who has hand-pulled weeds in a cool, damp climate knows how liable plants are to reroot themselves. Moldboard plows require greater power to drag and improved harness and livestock were developed for them. The horse collar and the proper ox yoke are relatively late developments in this tradition. The horse collar and the ox yoke transfer the drag of the implement to the shoulders and neck of the animals in such a way that they can exert great effort with-

1. A cutting tool (as a knife or sharp disc) that is attached to the beam of a plow. It makes a vertical cut in the surface and permits clean separation and effective covering of the soil and materials being turned under.

2. A curved iron plate attached above a plowshare to lift and turn the soil.

out choking or injury. The Peruvian Highlanders still use the inefficient horn yoke (the drawbar of the plow is attached to a stick tied across the horns of a pair of bullocks), which transmits the drag of the plow to the animal through the neck, substantially cutting the maximum force the animals can exert. This is sufficient for the light plow; perhaps full force would tend to damage these relatively delicate tools.

Heavy plows were responsible for the medieval economic and socio-political revolution of Europe. Heavy plows were known in Roman times, but only came into widespread use in the Medieval period in Europe, where they allowed the cultivation for the first time of the heavier, wetter, inherently more productive soils common north of the Alps. Prior to the extensive use of moldboard plows, Northern European settlement was mostly confined to belts of lighter soils that could be farmed with the scratch plow. As late as 1000 AD 80% of Europe was still covered by dense forest and was only opened to the plow by a wave of pioneering that lasted until 1300 or so. The adoption of the heavy plow required some very basic social-organizational innovations. Heavy plows required several families to pool their oxen to form a team large and strong enough to pull the heavy plow. The resulting “ox-gangs” became an important social group.

This was not the end, however, to the evolution of plow technology. A recent article by Hugh Sidney (1992) in *Time* describes how contemporary U.S. farmers are now abandoning the moldboard plow in favor of new techniques that better protect the land from erosion and increase crop yields—a change that Bill Richards, head of the U.S. Soil Conservation Service, called “a cultural revolution.” As Sidney recounts:

Instead [of using traditional plow technology], farmers leave residue from the previous year’s crops in place to hold soil and moisture, then scratch or chisel in seeds, which sprout through the decomposing residue. Crop rotation is used to break insect cycles. Weeds are targeted, controlled by new herbicides that quickly break down and vanish....

The techniques were known a half-century ago but not widely adopted because of stubbornness and no economic urgency. Now environmental concerns, politics and economic necessity have fortuitously converged to drive this farm revolution.

One indicator of how drastic the change has been is reflected in domestic sales of moldboard plows. 60,000 of them were manufactured in 1970; only 6,300 were sold in 1991!

D. Other Technological Developments (metal, cloth, ships, etc.)

Similar trajectories of development occurred for many other items of the expanding agrarian tool kit. Metallurgy, weaving, marine vessels, pottery, military equipment, and

many other classes of items improved substantially during the agrarian era. But it is a mistake to think that developments were steady. Rather, many scholars have suggested that innovations tended to come in irregular bursts, and that long periods of near stasis were the rule. The average rate of technical innovation was very slow by modern standards, and probably slowed after about 5,000 bp, when the basic agrarian toolkit was completed. It also seems that many important innovations were made by peripheral peoples, not the powerful, central societies of the day. For example, iron metallurgy was developed by the marginal Hittites of Anatolia (modern Turkey) (about 3,400 bp), not the central societies of Mesopotamia and Egypt. It is also notable that developments were more rapid in Eurasia than in America or Africa, to which agrarian technology diffused at a quite late date from Eurasia. Lenski and Lenski introduce some of the major hypotheses to account for this effect, and we will return to this problem in Chapters 24-28.

III. Demographic Effects

A. The Trend Toward Higher Population Density Continues

The main demographic consequences of agrarian technology were simply a continuation of the trend toward higher population densities and larger settlements. The latter is probably a more secure consequence of agrarian technology than the former. In principle livestock compete with humans for food and in some environments, advanced horticultural techniques can probably support more people per km² than agrarian techniques. On the other hand, the moldboard plow opened vast new tracts of land in Europe and greatly increased population densities. (One wonders why horticultural technology was not applied to these heavy European soils at a much earlier period. Perhaps it was, but the long-fallow forest horticulture was too minor a mode of subsistence compared to permanent cultivation of light soils to make much of an impact.)

Aside from average density, agrarian technology permitted urbanization of population to a greater extent than was possible under horticulture. The reasons were two. First, settlement sizes grew with agrarian technology because more productive farmers (per unit of labor) freed more people for urban specialty occupations. Second, land and maritime transportation improvements made it possible to supply great cities of 10⁵ or even 10⁶ inhabitants, such as Rome, Baghdad, and the Chinese capital cities. Rome, for example, could draw grain and other bulk raw materials Sicily, North Africa, Egypt, and Southern France to sustain large populations, even by modern standards, using maritime transport on the Mediterranean. It is productivity per unit of labor and transport efficiency improvements of agrarian technology, operating through the rise of large urban agglomerations of craftsmen,

priests, and administrators, that had the widest impact on the more peripheral culture core features of agrarian societies.

The populations of agrarian societies also fluctuated substantially around the slowly rising trend line, due to famines, disease epidemics and political breakdowns (civil wars, conquest by foreigners, etc.). At least at the high points, population densities often seem to have exceeded the level at which everyone could be productively employed at current levels of technology. Malthusian deterioration, under-employment and a decline in rural and lower-class urban standards of living, ensued.

IV. Social Organization

A. New Forms of Social Organization

The trend is for kinship to continue to decline relatively in importance as a means of regulating social life. As agrarian societies developed, an increasing proportion of the population withdrew from primary production in favor of other occupations. (When this proportion reaches 50% we will rather arbitrarily say that the society is no longer agrarian, but passes over the boundary of the commercial/industrial type.) As occupational specialization increases, new organizational principles are developed, such as guilds to regulate craft specializations, and markets for the exchange of the specialists' products. The ancestors of the modern business corporations and banks grew up around markets and long-distance trade. The development of large-scale political and religious institutions, covered in the next section, is part of this increase in social complexity.

Nevertheless, it will not do to discount the importance of kinship even in the more complex agrarian states. In the Chapter on trade and commerce (Chapter 18) we will see how large a role kinship played in early long-distance trade systems. Suffice it to say here that the role of kinship remained quite large in agrarian societies by comparison with modern ones.

B. Altered Sexual Division of Labor

The sexual division of labor remains fundamental to the economics of agrarian societies, but tends to change in form compared to typical horticultural systems. Recall, that women tend to put in a disproportionate share of the agricultural work in horticultural societies. Under agrarian technology men's labor becomes relatively much more important, chiefly because managing large animals is almost always, like hunting, men's work. Arguably, this is a functional division of labor because the strength of males is better adapted to handling large animals and because they demand full-time attention that women, who must mix work and child care, cannot afford. In any case men go back to substantial work after

a long vacation during horticultural times, so to speak.

However, the renewed economic importance of males is perhaps reflected in lower status for women. This is because in excluding women from agricultural work and marketing, women's labor becomes devalued. In addition, agrarian societies generally have a strong patrilineal bias to the inheritance and hence ownership of valuable property. These changed conditions in labor and ownership are reflected in marriage customs. Marriage among horticulturalists is frequently accompanied by bride-price payments to the bride's family to compensate for their loss of a valuable laborer. Dowry is more frequent in agrarian societies, payments by the bride's family to the groom's; men in agrarian societies have to be compensated for taking on a wife. On average, agrarian societies have perhaps the lowest levels of women's prestige and influence of any technological type.

C. Social Stratification

Agrarian societies are especially noted for their extremes of social stratification. The high-ranked lineages of tribal horticultural societies become (typically) a much more exalted ruling class, still typically combining religious and military institutions to justify and enforce their domination, and support elaborate patterns of consumption. Slavery, serfdom, or peonage is commonly the lot of the primary producer. The emphasis in the modern West on personal liberties and freedoms (and in the Marxist countries on economic equality for that matter) was in large part a reaction to the steep and rigid stratification of agrarian societies.

*Increasing social stratification is linked to a more developed division of labor. Less onerous but strongly customary bonds between non-agricultural occupational specialists were common, contributing to the emergence of middle and lower middle classes of merchants and craftsmen. In agrarian societies we see elaboration of domestic relations within the household, the "upstairs, downstairs" syndrome. India carries this sort of thing to the logical extreme in the caste system (Srinivas, 1962). In the caste system, each occupational specialty is an endogamous group, a *jati*, with local custom dictating the relationships between castes in quite some detail.*

Because of the sharp and rigid social stratification of agrarian societies, you might think them poor subjects for mythologizing by moderns. If so, you are too quick to dismiss the power of imagination over reason. Many "Neo-feudalist" romantics hark back to these days of oneness and wholeness and pleasant outdoor work under the benevolent guidance of Lord and Prelate. Not everyone is really comfortable with the freedom, flexibility, and anonymity of modern life. The tight social structure of agrarian societies seems attractive,

especially, perhaps, to those who imagine ascribed elite roles for themselves. One of us (PJR) suspect some professional academics of this, such as the creators of Middle Earth student housing. They named their streets after characters and places in Tolkien's ring trilogy, one of the smarmiest³ romanticizations of feudalism. And they seem to exalt the small-scale communalism of the medieval manor. Of course, no one makes a big point of social stratification in these romanticizations (or if they do it is made to seem colorfully harmless; remember the Kennedy era being tagged with the Camelot label). Are there modern politicians who dream of being Princes, Dukes, Lords and Bishops? Perhaps we're too skeptical?

V. Political Institutions

A. States are Characteristic of Agrarian Societies

The main institutional innovation of agrarian societies is the state. As we saw in an earlier Chapter, some advanced horticultural societies developed state-level political organization, but the earliest, and until recent times, by far the most powerful and elaborate states were based on agrarian technology.

On the one hand the state is an effective institution to manage the immense redistribution required if productive farmers are to be linked to specialist producers of metal tools, cartwheels, cloth, and the like. The invention of writing and mathematics are important technical contributions of such societies, and were born of the needs of the bureaucrats of the early states to keep track of the immense flows of products the state handled. The earliest documents, for example the great troves of cuneiform clay tablets discovered in Mesopotamia were records for royal storehouses. It is interesting that the modern analog, the automated database system, was among the very first and still most popular applications of computer technology. It seems that in their redistributive function the earliest (and latest) states were just larger-scale versions of the tribal chiefdom, if a hard line of any kind can be drawn on the continuum.

On the other hand, the productive division of labor of agrarian societies is a strong temptation to the guileful priest and the greedy warrior. These two classes often combine to extract a scandalously disproportionate share of the farmers', artisans' and traders' efforts (by modern standards; we must take care to understand before we condemn). The sharp social stratification we noted above is closely related to large differences in political power buttressed by an impressive ideological superstructure, typically an official state religion. This development is presaged in the high consumption standard and sacred person-

3. Smarmy \ˈsmaɪr-meɪ\ smarm (to gush, slobber). Revealing or marked by a smug, ingratiating, or false earnestness (e.g., "a tone of smarmy self-satisfaction").

age of the tribal chief in the more elaborate cases of chiefdoms. Still, as the historian William McNeill notes, it is dangerous to press things too far. Too great an extraction of the surplus makes the peasants restive, and weakens the society's ability to resist foreign invaders. An uneasy balance is often the result, and the theoretical puzzle of the relative contributions of group-beneficial and purely exploitative processes to explaining stratified societies is even more acute than in the ranked tribal case.

States begin to control internal violence by enforcing a rule of law. Political leaders provide a formal legal system and claim a monopoly on the legitimate use of violence. Hammurabi's code from ancient Mesopotamia, around the time when proper states first emerged, is an early and famous example of the emergence of this state function. Self-help violence is no longer the only way to enforce social rules.

The ability to ensure within-group peace for extended periods of time, combined with the greater managerial scope and transportation improvements, made large scale warfare possible among states. In many areas, classically in Mesopotamia a few hundred years after city-states/advanced chiefdoms appeared, this increased military scope led campaigns of permanent imperialism to replace the basically plundering campaigns of the tribal period. The reading for Chapter 19 gives some insight into this period, and to the history of warfare in agrarian states more generally.

B. Instability

One apparent consequence of the political complexity of states is that they tend to be unstable. Dynastic changes, foreign occupation, and the collapse of imperial states into smaller constituent city states, even the regression of states to the tribal scale of organization are common. Further, it is common for large states and empires to co-exist in similar environments, using similar technologies, with small city states or even tribal societies. For example, during the European burst of state-building that occurred in Europe in recent centuries, Germany and Italy were dominated by city states and principalities long after England, France, Spain, and Russia had large states. Similarly, the Greek city-states coexisted for centuries alongside Asian empires. Then, suddenly, under Philip and Alexander, the Greeks went on an empire-building binge of their own.

An hypothesis that such events are independent of ecology has been developed by Colin Renfrew (1973) and William McNeill (1982). They imagine that tribal chiefdoms, states, and empires are inherently prone to instabilities. Some of you may have heard or read about chaos theory, which describes how even relatively simple systems can exhibit large irregular fluctuations. This is the sort of thing Renfrew and McNeill have in mind.

Ecological processes of one kind or another may rather easily promote the evolution of more complex states only to have other processes, such as population growth causing declines of economic well-being and consequently revolt, shatter them. At any rate, recorded history can easily be read as a most bewildering pattern of political expansions, contractions, and fragmentations (have a look at the intricate maps that are needed to portray these changes in any good historical atlas). Almost all of the systemic processes we will examine later in the course have been invoked in these cases, demographic events, disease, inter- and intra-society conflict, environmental deterioration, climate change, and technical innovation. We do not want to give up on the evolutionary ecological approach too soon! Authors in Yoffee and Cowgill (1988) have recently reviewed several examples of collapse in ancient agrarian states without coming to any firm conclusions.

VI. Environmental Gradients and Core Response

A. Introduction

Once again, our question in this section is whether the same basic technology applied in different environments leads to adaptive variation of culture core variables. Such features as rainfall, length of growing season, availability of irrigation water and the like influence the productivity of agriculture. Topography greatly affects transportation costs. Flat open topography, navigable rivers, and proximity to seacoasts make access to markets easy, but also expose farmers to offensive military action. Rough topography isolates farmers from both. It is easy to imagine that these sorts of environmental variables should affect the whole suite of culture core variables. Our example is the variation in ecological variables and cultural responses in the Indus River drainage of present-day Western India, Northern Pakistan, and Eastern Afghanistan.

B. Environmental Variation

Since agrarian technology was applied historically from Spain and North Africa in a more or less broad swath right across temperate and subtropical Asia to the Pacific, a very wide variety of climates, soils, and topography were (and still are) exploited by agrarian producers. Western Eurasia has temperature and rainfall gradients running from the warm, dry, winter-rain Mediterranean region, to the cool ever-moist Northwest. Climates become more continental (hotter summers, colder winters) inland. Central Asia is a complex of arid and semi-arid lands, dominated on the east by the Himalayan massif. The Indian subcontinent is strongly affected by the Monsoon (the flow of warm wet air from the Indian Ocean and Western Pacific onto the continent). In the Far East there is an aridity and temperature gradient from the dry regions of central Asia, and the cold of Siberia, toward

temperate, subtropical and tropical moist regions to the southeast. Figure 5.1 in the previous chapter (from fig 21-22, Walter, 1985, with modifications) shows how these environmental gradients are expressed in the natural vegetation and agricultural potential.

Strong gradients give us the best test of the culture core concept because they tend to control for the effects of history by permitting long-continued contact and diffusion of culture between neighboring peoples, as we saw in our previous example of culture core variations in horticultural societies on the Andean gradient and the pastoral comparison of West and East Africa. The Himalayan mountains and there surrounding lowlands provide many similar a test cases for agrarian technology. The Indus River drainage has headwaters in the Hindu Kush and Karakoram ranges of the Western Himalaya, and its mouth on the Indian Ocean at Karachi (Figure 6-2). The Indus region is mostly arid to semi-arid, with much of the river's flow generated by rainfall and snowfall in the high mountains (the peak K-2, 8,611 m, second only to Everest, is on the divide between the Upper Indus and the drainages of Western China). In upstream sections, the river and its tributaries flow in dozens of relatively narrow canyons from 1,000 m elevation up into the very rugged mountains. At middle elevations, 1,800-3,500 m, mountain slopes are covered with conifer forests, above which mountain meadows are the highest territory of interest to agrarian producers. From 1,000 m to sea level, the river and its 4 major tributaries flow 1,100 km across a broad, flat alluvial floodplain, much like the Tigris-Euphrates, Nile, and Sacramento-San Joaquin Valleys. Norwegian Anthropologist Fredrik Barth (1981) conducted classic human ecological studies of the Pathan peoples of the middle Indus and their neighbors which well demonstrates the impact of this gradient on culture core variables. (See also Eglar, 1958; Keiser, 1991, Nyrop, 1984, Galaty and Johnson, 1990; for a great “good read” account from the British Imperial perspective see Hopkirk, 1990.)

C. Technological Variation

The classic ox drawn scratch plow agrarian technology has been applied for several thousand years in the Indus Basin (Bharadwaj, 1961). Because of limited and seasonal rainfall, irrigation is practiced everywhere from sea level to the limits of cultivation at around 2,000 m elevation

As elevation increases, the land available for cultivation shrinks relative to pastureland. In the arid lowlands, livestock must be mainly fed from irrigated lands on wastes from food crops, and a minimum of livestock are kept, although this minimum is necessary for traction, dairy products, and dung for fertilizer and fuel. The average is something like 1 cow per 4 people. The province of Punjab, now divided between India and Pakistan, is the

most productive of the lowland districts. A number of tributaries of the Indus cross the Punjab providing irrigation for a substantial area, and level areas between the rivers can be irrigated from shallow wells..)

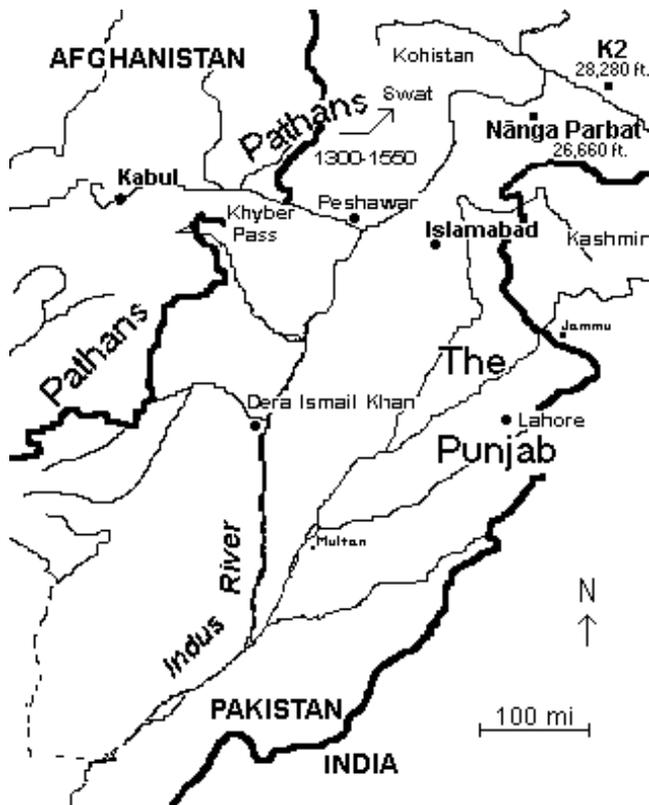


Figure 6-2. The Indus River Basin. The Pathan region along the Pakistan-Afghanistan is hilly. As indicated by the locations of K-2 and Nanga Parbat, the country where Pathans and Kohistanis interact becomes very rugged. The Punjab, especially lower on the rivers (Multan) becomes quite flat.

Above 2,000 m land is only useful for pasture, and the highest elevations are exploited by pastoral nomads, owning perhaps 3 head of cattle (or cattle equivalents counting sheep and goats), per person. A variety of mixed farming strategies are pursued at middle elevations depending upon the ratio of irrigated to grazing lands, and their proximity. In Swat, where Barth worked, Pathan farmers engage in a relatively productive double-cropping agricultural system that includes rice and other subtropical plants. Pathan farms are relatively distant from mountain pastures, and Pathan landlords have a symbiotic relationship with Gujar herders who use the summer pasture owned by Pathans in exchange for livestock products. Above about 1,500 m elevation in Swat, Pathan villages are replaced by another ethnic group, Kohistanis. Kohistani farmers irrigate small, narrow, terraced fields with ingenious irrigation works, and herd substantial numbers of animals in the mountains above their villages. Because of the smaller fields and cooler temperatures only one crop is possible per year, and the variety of crops is restricted.

Ease of communication is also a function of elevation. The Punjab lowlands are eas-

ily traversed by wheeled vehicles, and trading (and raiding) are practical. Highland villages, by contrast, can be reached only with considerable difficulty by rough trails up narrow gorges and across formidable passes; trading is difficult, but defense is easy.

D. Demography and Social Organization

Punjab urban societies are good examples of the Agrarian States. Lowland Punjab is densely settled. Villages of a few hundred to a few thousand are thickly scattered on the plain a 2 or 3 kilometers apart. There is a considerable hierarchy of settlements, with market towns every 15 or 20 kilometers. At the top of the pyramid are large cities, like Lahore. The Indus region has a long history of urban centers. The ruins of Mohenjo-Daro on the lower Indus and Harrapa in Punjab are the oldest cities on the Indian subcontinent, and date to 2,500 BC, only a little later than the very earliest cities in Mesopotamia. For most the period since the Harrapa culture, large Empires held sway in the Punjab. Before the independence of India and Pakistan, the Mughal Empire dominated most of the India subcontinent. Before the Mughal conquest in 1526, Punjab was ruled by Turko-Afghan dynasties, introducing Islam. Even in Islamic Pakistan, the caste system developed in pre-Islamic Hindu India is a major mechanism of social organization. Occupation is fixed by birth, individual mobility from one caste to another is extremely limited, and economic relations between castes are subject to complex customary regulation. Since Islam has an egalitarian ideology, there is no religious underpinning to caste as there is in Hindu India, but nevertheless the institution is very strong. Village life is typically dominated by a landowning elite caste, which may or may not be a majority. A fair number of villagers will belong to one of a number of separate crafts castes, such as barber, blacksmith, carpenter, cobbler, sweeper, potter, and so forth. These terms are misleading in the sense that each caste tends to have a complex array of tasks, for example the barber may also be the cook for large village ceremonies.

The high-caste ruling elite is predominantly urban, historically often of foreign derivation, and the villages are ruled indirectly, through the local landholding citizenry, a prominent member of which is the village headman. The headman arranges for the collection of taxes, but also attempts to obtain favors for the village from central authorities. The worst urban regimes are greedy, brutal and incompetent. The best are enlightened authoritarians that take an active interest in the administration of justice and in advancing economic prosperity. Overt expressions of local or regional independence are suppressed with great energy by urban elites, and local villagers are without arms. Many additional caste specialists, such as soldiers, jewelers, scribes, merchants, and long-distance traders are concentrated in the urban centers.

In traditional Punjab, there was a complex mosaic of cross-cutting ties of varying

strength between people--village, district, caste, religion and sect within major religion. Partition in 1947 simplified the Pakistani Punjab social system to the extent that almost all Hindus and Sikhs left for India, but otherwise the principle remains the same. A unified sense of nation, such as we are familiar, was virtually absent. Political boundaries were drawn and redrawn without much affecting village life, although warfare among elites and between elites and conquerors and raiders was sometimes devastating.

The Pathan tribes are the largest ethnic group in Afghanistan as well as dominating the middle elevation regions of Northwest Pakistan. The Pathans of the hill regions are organized tribally rather than as states. Barth describes the social and political system as feudal. At the village level, an Islamicized caste system operates similar to that in Punjab, with domination by the landholding elite. More than 20 castes are participants in the system, with Pathan landowners at the top. The difference is that Pathan landlords are skilled and dedicated warriors, much like the knights of the European early Middle Ages. Pathans subscribe to a complex tribal code of ethics, *paktunwali*, that includes patrilineal descent, Islam, male honor, seclusion of women, standards of hospitality, and social equality of all male Pathans. Public ceremonies celebrate and promulgate this value system. The larger and more successful landowners attract a body of low caste clients and are recognized as chiefs among the local Pathans as well. The "chiefly" role is not formally hereditary, but is based a family maintaining wealth and influence. The chiefly role resembles what we have called bigmen in connection with horticulturalists in its relatively informal and achieved rather than ascribed nature. To be a Pathan proper, a man must own land. There is downward mobility from the elite Pathan group if a family loses its land but no upward mobility. All village landowners participate in the affairs of the community. Much as in common situation among pastoralists, a segmentary lineage system links villages together.

For temporary purposes, chiefs can negotiate alliances with other chiefs and assemble as many as 10 or 15 thousand warriors, usually either for predatory raiding, conquest of new territory, or defense (Note some parallels between the Pathans and tribal societies with horticultural and pastoral subsistence). Pathans have been exposed to the idea of a state for a long time, and have organized some states (the Afghan state centered on Kabul and the Swat state organized in the early 20th Century are examples) and imposed themselves as elites elsewhere (including the Punjab). However, the independent, egalitarian tribal ethos is distinctly hostile to state formation, especially to the rigid, arbitrary, deeply hierarchical, authoritarian state typical of the region. That is, Pathans are willing to serve as conquerors and feudal nobility with a personally sworn loyalty to a conqueror; every Pathan warrior is a potential king or nobleman if the opportunity for conquest arises, much the case with pas-

toral nomad conquests. Pathans, however, vigorously resist attempts to make them subordinates in a state system. A Pathan landholding warrior may swear personal allegiance to his local chief, but is not comfortable as a citizen of a state several steps down in the hierarchy.

Due to the difficult nature of the mountainous territory the Pathan tribes have long controlled a large block of country west of the Indus. Although in some regions, isolation nearly completely defeats attempts to control the tribes (Barth believes that Pathans in the Swat area have never paid taxes to an external state), in other areas, Pathans control the major routes from the Indus to Central and Western Asia, the legendary Khyber Pass for example. Rulers with imperial ambitions have exerted great effort to control the passes. Sometimes states have controlled the routes for varying periods of time, although some of the greatest, Alexander of Macedon, for example have been defeated there. The British attempt to control Kabul west of the Khyber was defeated in the winter of 1842 with the massacre of the entire garrison as it attempted to evacuate through the mountains to India. The recent defeat of the USSR in its attempt to control Afghanistan is the latest in a long list of imperial defeats at the hands of the Pathans.

In the Swat region of Pakistan, Pathan expansion has reach an equilibrium with the original Kohistani inhabitants dominating the higher elevations. Barth argues that the Kohistani--Pathan boundary is imposed by an ecological barrier, low agricultural productivity. The Pathan feudal life-style requires a productive, double-cropped farm to support the cadre of low-caste retainers that make the warrior elite's investment in hospitality, arms and military activity possible. Pathans have expanded at the expense of Kohistanis in the past, but the boundary has been stable for many generations. The single-cropping system of the Kohistani region, only a few specialists of any kind can be supported, and no man can aspire to have enough low caste retainers to live a life of leisure at their expense. Village councils of elders and lineage headmen meet to decide important matters, and some coordination between local villages of 400-2000 inhabitants was possible. However, neither the chiefly role nor the large-scale collective tribal identity are as well developed as among the Pathans. Invading Pathans were thus able to evict Kohistanis from the lower double-crop region because their political system generated sufficient armed pressure to overcome Kohistani resistance. It must not be thought that Kohistanis are pushovers. Keiser (1991) describes how in the mid 1970s Kohistani communities united to fight Pakistani government attempts to control timber resources. After using tanks and air strikes to attempt to suppress the insurrection, the central government eventually settled the issue by substantially increasing timber royalties!

Our special case of the Indus gradient generalizes well to the general relationship between tribally and state organize agrarian societies in other parts of the world. The guerrilla tactics inherent in the heroic, individualistic, segmental tribal system is quite effective in rugged, sparsely settled terrain, but in open, densely populated country, fortifications and large, coordinated armies generally get the best of tribesmen. Pathan tribal farmer-warriors are not unique. Scotland, Wales, and Western Europe north and east of the Rhine resisted Roman domination in the Classical period, and the Highland Scots retained their rough tribal ways until Cromwell's time (17th Century). Swiss mountaineers maintain their cantonal independence right down to this day. The Swiss still have universal military training, and every able-bodied Swiss male has his assault rifle in his closet. That the Germans left them alone in WWII is some testimony to the military reputation they still have. Bronson (1988, in Yoffee and Cowgill) argues that agrarian and horticultural tribesmen on the frontier were responsible for the relatively late and uncertain emergence of the state in India. He argues that other places, such as Luzon Island in the Philippines, would certainly have seen states emerge except that the ratio of rough mountain country to open plains was too high. Raids from the mountains seem to have kept the fertile but indefensible plains virtually unpopulated.

VII. Other Aspects of Culture

An example: Child rearing practices are harsh. One interesting correlate of agrarian societies is authoritarian patterns of child rearing. Among modern members of tribal and agrarian state societies, child rearing is much more rigid than among hunter-gatherers and the modern industrial middle class. Rigid, arbitrary rules are stressed and corporal punishment is well used. The resulting individuals seem to be much less independent, but much more cooperative. This might be interpreted as an adaptive result of the need for greater cooperation between individuals in agrarian as opposed to hunting production. Also, one might imagine that independent, individualistic peasants would have trouble coping with the arbitrary rules and stiff exactions of their overlords. The Robin Hoods of most agrarian states were no doubt fairly promptly caught and killed, usually in some rather unpleasant way, like crucifixion.

As already noted in passing in discussing the Indus gradient, religious belief systems are part of the ideology of Pakistani Punjabis, Pathans, and Kohistanis. Although all are today Islamic, local custom and belief is richly variable. Religious leaders and scholars are generally respected and play significant political roles. As in the very well developed case of *paktunwali*, the local variant of Islam typically underpins local and regional identities,

and provides an ideological framework for the prevailing social organization. How necessary the more abstract parts of the ideology are for social organization is a debatable issue. On the one hand, *paktunwali* seems to be an important component of Pathan success in assembling larger military forces than other tribesmen. On the other hand, the customs of caste survive in Pakistan in the face of a religious system that seems quite hostile to its heavily hierarchial Hindu underpinnings in India. In fact, agrarian states and feudal societies often have a lot of quasi-hereditary economic specialization, so the existence of it despite the egalitarian ideology of Islam is not too surprising, especially given that Islam is a relatively late overlay of a formerly Hindu society. Still, the fit between religious ideology and social structure is not particularly close if such contrasting religions as Islam and Hinduism are both consistent with caste social structure. Caste itself may be a core variable but not religious ideology.

VIII. Conclusion

A. *The Trends Continue*

As technology becomes more sophisticated, and more people are supported per unit of labor, the complexity of social institutions increases.

In agrarian societies, some of the simple correlations between social complexity and environment begin to disappear, but we argue this is misleading. One view is that humans with this technology have moved a large step toward controlling their environments, are less dependent on them, and hence show fewer correlations between environment and technology-related traits. A rather different view is that as societies become larger and the movement of goods and people cheaper, they incorporate an increasing range of environmental variation within their borders and trade system. Then simple correlations between gross environmental variation and the gross form of society, such as hunter-gatherer and horticultural societies exhibit, is reduced. *But environmental factors may still play a strong role as variables that affect the internal structure and history of a society in complex ways; i.e., they become “intrasystemic.”* For example, the average size of agrarian states will depend on the ease of transportation, major cities will tend to be located at trade nodes, and the demographic history of a society may depend on disease episodes. In the modern age the location of resources (e.g. Middle Eastern oil) and the problems of environmental deterioration (e.g. the looming global warming problem) seem to suggest to us that even the most sophisticated industrial societies are far from independent of the environment. Let us keep the Lenski and Lenski hypothesis in mind during the Systemic Interactions part of the

book, Chapters 17-23.

IX. Bibliographic Notes

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General:

The literature on agrarian societies is immense since many of these societies kept written records and have been the subject of historical scholarship. Similarly, since many of them still exist, they have been studied by social scientists of all sorts. This means that the first task for a beginning student interested in general issues. Two books are particularly helpful:

W.H. McNeill. 1963. *The Rise of the West: A History of the Human Community*. Chicago:

Univ. of Chicago Press. (McNeill stresses technological and ecological processes, and hence fits our prejudices. We'll be reading some bits of his work later on).

The Times Atlas of World History. 1979. London: Times Books Limited. (Beautiful maps and nice essays. Perhaps half the book is relevant to agrarian societies. A good reference that is sometimes offered as a come-on by book clubs and remainder shops, so you can get one cheap. One of our all-time favorite books, although it has the bad drawback of having no references.)

Many popular histories give a good sense of the late agrarian period in the West. Barbara Tuchman's *A Distant Mirror*, mostly about 14th Century France, is a good example.