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The Iranian Deserts

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The Iranian Deserts

Abstract

This chapter marks a transition in the volume from agriculture to other subsistence bases. It is concerned particularly with the effects of environment-and the technologies used to exploit it-on the culture and identity of pastoral nomadic groups, mining colonies, and certain agricultural communities specializing in different ranges of crops. It deals with an arid region where these three occupational categories are closely linked and interdependent economically. It suggests that before agricultural technology reached a stage of development that would allow exploitation of such a marginal region, exploitation by other means (for example, pastoralism) was not possible either, and excess population from the lush peripheries was not able to overflow into the deserts.

Disciplines

Anthropology | Desert Ecology | Social and Behavioral Sciences

Comments

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**Population
Growth:**

edited by
Brian Spooner

**Anthropological
Implications**

This chapter marks a transition in the volume from agriculture to other subsistence bases. It is concerned particularly with the effects of environment—and the technologies used to exploit it—on the culture and identity of pastoral nomadic groups, mining colonies, and certain agricultural communities specializing in different ranges of crops. It deals with an arid region where these three occupational categories are closely linked and interdependent economically. It suggests that before agricultural technology reached a stage of development that would allow exploitation of such a marginal region, exploitation by other means (for example, pastoralism) was not possible either, and excess population from the lush peripheries was not able to overflow into the deserts.

The Alburz, Zagros, and Hindukush ranges in Iran and Afghanistan enclose an immense area (about 500,000 square miles) of desert and semidesert plains.² Though they can by no means all be strictly defined as desert, for convenience I refer to these plains throughout as “the deserts.” Unlike most similar areas in the world, they lie at the very center of a culture area. For at least two and a half millennia the same culture has extended far to the east and west of them, and for most of this period there have been major cultural centers of one and the same culture on all sides of them. The deserts as a whole constitute a natural barrier to communications only to the extent that the traveler cannot live off the land. He will perish if he runs out of supplies on the way, but he is otherwise unlikely to die of exposure to the natural conditions of the environment. However, the very nature of the deserts causes him to move faster than he would over a similar distance through settled country. Therefore, two cities a thousand miles apart on either side of the deserts will be closer in time than two cities similarly spaced on the same side—though people may be less ready to travel between them. The emptiness of the deserts enhances mobility and favors the hit-and-run methods of raiders. It is not surprising, therefore, that traditionally

the deserts have been the natural element of raiders, as the Persian Gulf was of pirates (see Toynbee 1934: 39ff.). The deserts link the territories on either side of them while at the same time they separate them. And this paradox is the key to an understanding of their role in the history of the area. They have never contained a major regional center, but a glance at the place names sprinkled through them even on the inadequate maps available suggests a degree of human activity that requires investigation, and my own field surveys substantiate this.

The desert center of the Iranian culture area therefore is not a vacuum. The purpose of this essay is to discuss on the basis of data presently available the demographic processes operative both within the deserts and between them and the major cultural and political centers outside and around them. These processes must be discussed against the background of the natural environment and the ability of the various elements of the population to exploit it—that is, the various technologies. We are concerned with small oasis settlements with optimum populations determined by the level of technological achievement, and we are able to elicit information concerning settlement, communications, political, military, and social movements, and levels of technology and investment over a time span of up to and even exceeding a thousand years.³ There is no evidence of change in agricultural technology during this period. In my interpretation the available data suggest that pressure of population on resources tends to lead to intensification of labor and investment up to a certain point (which is a function of both environment and culture), beyond which it is diverted into marginal pursuits in marginal areas. The culture and ecology of the marginal areas can be properly understood only in the context of the total cultural and social universe and, in particular, the relationships with the (primary) agricultural settlements on the periphery of the deserts.

The Physical Environment

The accompanying map (Fig. 10.1) is designed not only to show the extent and location of the deserts but to illustrate some of the topographical factors that are important to the discussion. It so happens that practically all the area below the 1,000 m contour is desert or near desert, and everything above the 1,500 m contour is mountainous or

narrow plateau corridors between ranges. The space between the two contours coincides very closely with the fertile and comparatively well-watered country of the alluvial fans, which slope down from the mountains to the depressed desert center of the plateau, rather like the rim of a saucer. A number of cities, many of them of considerable antiquity, lie within this space. Many of these cities have at one time or another been the major political and cultural centers of the Iranian world, and the written history of the Iranian plateau has been primarily the history of these cities. The major capital of the Iranian world—when it has not been on the plateau—has moved between points as far west as the Tigris (Ctesiphon and Baghdad) and as far east as Samarqand. During the very few brief periods of cultural eclipse it has moved even farther afield.

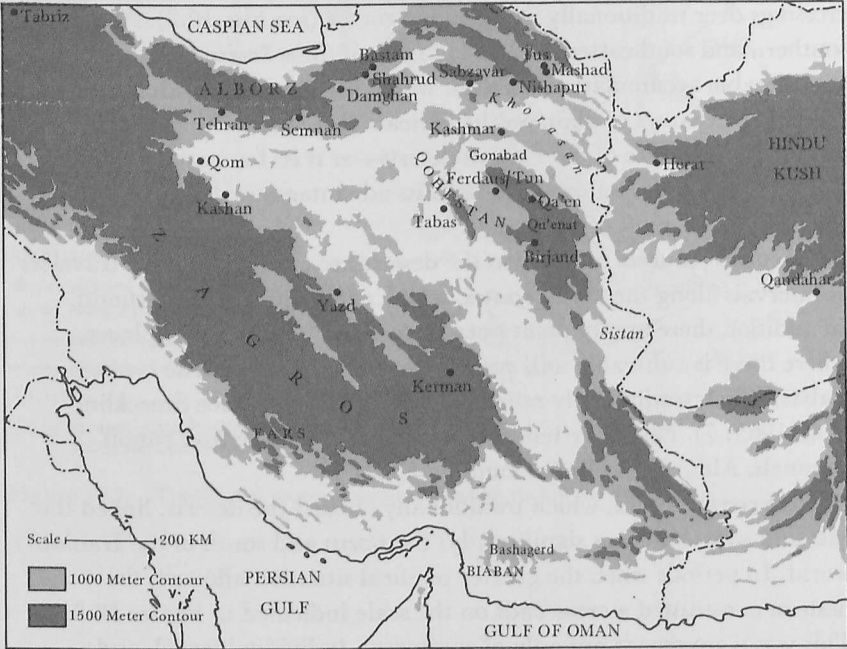


Figure 10.1. The Iranian Plateau.

Situated roughly centrally between these extremes, the deserts are doubly circumscribed—socially and naturally—by the relatively dense population and lushness of the fertile belt around them and by the mountainous barrier beyond.

Within Iran the deserts fall naturally into two main parts: the northern, which contains great expanses of saline mud flats (*kavir*); and the southern, which is characterized chiefly by rolling gray gravel plains. The latter receives less drainage from the surrounding mountains and contains fewer springs. It has been characterized as one of the most forbidding deserts of the world. The *kavirs* are generally treacherous. The water table is very close to the surface. Precipitation in the surrounding mountains finally drains into these sumps, and they become literally impassable bogs (cf. Hedin 1910). However, caravans did make crossings over traditionally well-defined routes (see Fig. 10.2). Along the southern and southeastern borders of most of these *kavirs* there are considerable accumulations of sand, which is a general characteristic of the larger expanses of plain on the plateau. But, generally speaking, sand is not a feature of the Persian deserts—as it is, for instance, of the Empty Quarter of Arabia—and both its advantages and disadvantages are absent over most of the area.⁴

The major sources of water in the deserts are cisterns built for travelers at intervals along the major routes, which catch and conserve runoff. In addition there are frequent potable springs,⁵ and in a few places, where there is cultivable soil, *qanats*⁶ are viable. There is one town, Tabas, which traditionally relied on a perennial river (see Stoecklin et al. 1965: 7). Pasturage tends to be confined to wadis and runoff channels. Although wells are found, they are rare.

The arterial routes, which traditionally crossed the deserts, linked the east and west, and (less significantly) the north and south of the Iranian world. In periods when the greater political situation allowed, the plateau constituted a crossroads on the scale indicated in Figure 10.3. This was a crossroads not only of commerce, individual travel, and communication but also of mass movements of armies and peoples. The present distribution of cultural and linguistic groupings on the plateau derives historically from this condition.

But the deserts are not only a system of throughways. They are also a cul-de-sac. They contain many groups of people that went in one side

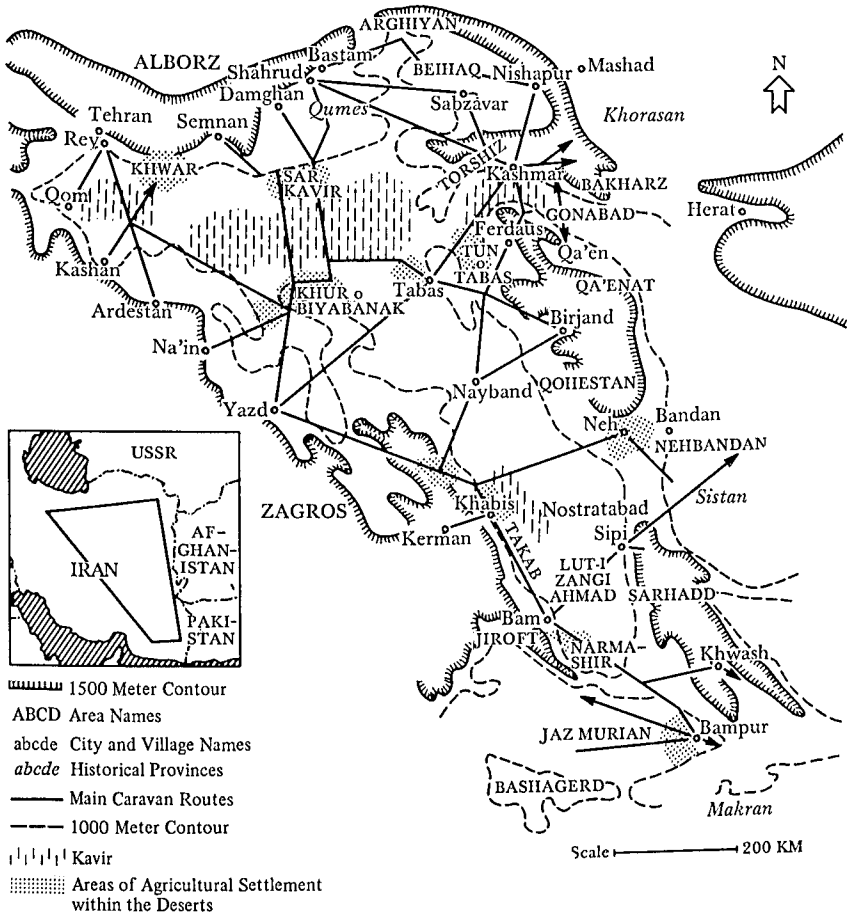


Figure 10.2. Traditional routes of communication within the deserts.

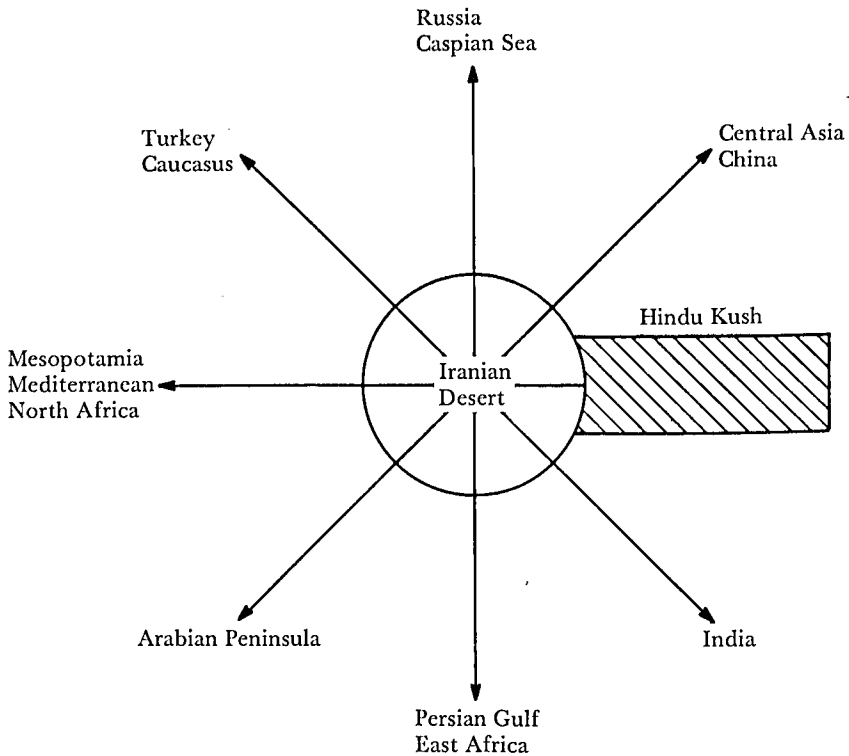


Figure 10.3. Schematic representation of traditional long-distance communications relevant to the area of the Iranian desert.

but never came out the other. It is the combination and complementarity of these two factors that form the background of the discussion in this essay. I am interested in the relationship between population and resources in the cul-de-sac, but this relationship is not comprehensible without an appreciation of the existence and role of the throughways.

Occupation, Technology, and Identity

The great attraction of the deserts as a field of study is that social units within them are relatively small and well spaced, so that, superficially at least, it is relatively easy to isolate social processes in space. The social identity of individuals derives from their membership in a particular

social group. In the deserts social groups and occupational groups tend to be coterminous. The identity of the individual is generated by the relationship with the natural environment that is involved in the occupation of his social group. However, the composition of the groups changes continuously. This continual redistribution of population between social and occupational groups is caused by demographic processes: unequal fluctuation in the population of various groups causes pressure of population on the available resources in one place and a relative vacuum in another. Individuals have to change groups. Often this requires a change in occupation that results in a change in ideology and identity. Therefore, in order to arrive at a better understanding of the demographic situation, it is necessary to investigate the ecologies and technologies of the various groups.

A minimal survey is sufficient to show that—in the traditional, or predevelopment, situation—activity can be summarized under three main headings. These are subsistence, communications, and security. Communications are on two planes, linking (a) the cities on either side—the principal channels of trade, pilgrimage, and administration—and (b) the various scenes of activity within the deserts. Subsistence comes from agriculture, pastoralism, or mining; and security is both locally organized by the subsistence communities and delegated by the peripheral political centers for the security of their own back doors and of the caravan routes. It is the caravan trade generated by the peripheral cities which gives rise to the raiding and thus necessitates the security arrangements. Further, the caravan trade constitutes an auxiliary resource that may be exploited for subsistence within the deserts.

The sites and distribution of each of these three categories of activity are predictable to a high degree. Traffic follows the shortest route from city to city with due allowance for natural obstacles (such as *kavir*, sand, and mountains), the natural corridors between them (natural passes, torrent beds, and wadis), water sources, oases, and, occasionally, also shrines. Caravanserais are not so common within the confines of the deserts as they are on the great routes that go around the north and west of them (see Siroux 1959, map), though they are found on stretches of the Kerman-Meshed and Yazd-Meshed routes. The foundation of a caravansarai requires reliable water supply and security, both of which are scarce. It is in the absence of these facilities that chains of cisterns

are constructed, generally at one-parasang intervals, which catch and conserve the runoff from the occasional precipitation. These are built and maintained largely by private investment.⁷ Owing to the vagaries of the precipitation pattern, even when they are kept in good repair, not all of them will contain water at any given time. But the traveler will usually find water in one somewhere along his route. They were built on minor as well as major routes, and kept water fresh for surprisingly long periods (for details of construction see Siroux 1959).

Sites of potential agricultural activity are predictable where accumulations of cultivable soil coincide with a supply of water that the local population, with the level of technology at their command, can exploit for irrigation. Pastoralism is predictable in a similar way. However, while it is possible to delineate areas where pasturage (of rather poor quality) is generally available—and unlike the Arabian situation these areas are fixed by the topography—nevertheless, the pasturage they afford appears not to be sufficient to support independent groups of pastoral nomads. This does not mean that pastoral nomadism or pastoralism is therefore nonexistent. Rather, the pastoralist must also have access to other resources in order to subsist. Where there is an oasis settlement fairly close by, the pastoralist turns out to be an agriculturalist who uses pastoralism as an auxiliary resource. This situation is general in the northern two-thirds of the deserts. Where areas of pasturage are not close to settlements—a situation typical of the more arid southern part of the deserts—nomads rely on pastoralism as one of a number of resources, often the main one, but their nomadism must include the exploitation of other resources in order to attain a level of subsistence.

Further discussion of social process in the deserts requires some understanding of the different technologies involved in the exploitation of the resources of the deserts. I do not wish to give the impression that I consider any of these technologies physically restrictive, in the sense that they necessarily require long apprenticeship or inhibit change of occupation. However, technology is an important factor in a man's identity. Men are born into social groups, and in the traditional situation birth tends to determine what a man's occupation will be. There are processes whereby he may change his group membership and his occupation, but when these changes do occur, other factors are often also involved. The

differences between a miner and a peasant and a nomad are not simply differences of occupation and technology: they are differences of Weltanschauung or ideology and identity. And most significantly in this context, they entail very definite differences in attitude toward the environment.

The nomad, insofar as he is pastoral and nomadic and does not also cultivate, relates to a total and unimproved environment. He may be compared to a hunter-gatherer. He hunts and gathers for his animals as well as himself. He does nothing to improve or modify the physical environment that is his habitat, except (in some areas) to dig occasional wells.

The agriculturalist, on the other hand, must improve his environment. He must irrigate. Irrigation on the plateau is by *qanat*, spring, or river. *Qanats* are constructed where there is cultivable soil. Where waterflow is available from spring or river, fields of cultivable soil must be *constructed*. This is done by means of terracing and *bands* (drystone walls and earthworks enclosing soil). The agriculturalist concentrates on his small improved enclave within the total environment and on his title and his investment within that. Though he may also hunt and gather outside it, and will almost certainly travel outside it at least occasionally for purposes of trade, pilgrimage, and now also business with the larger administrative centers, his main relationship with the world outside is conditioned by his interest in the defense and security of his small improved enclave.

The miner is different again. Ideologically he is best characterized as a member of a desert proletariat. Although he generally retains at least some residual title to membership in an agricultural village community, he relates primarily to a vast area in which the fixed points are mine workings at various stages of exploitation. There is a general camaraderie among all miners that is based on a common experience (despite differences in mineral mined), on the mobility from old to new workings inherent in the occupation, and in the common dialectal elements that develop.⁸

Therefore, the sites, the ideologies, and the technologies of the different types of human activity are both highly predictable and generally fixed and permanent in the traditional situation, with considerable histories, though there may be continual movement of individuals between them.

We must pause here to consider some aspects of the technologies in greater detail, in order to appreciate the potentiality of the environment in general and the fixity of the communities within it. These are factors that regulate the size of social and subsistence groupings independently of demographic fluctuations and therefore stimulate mobility of individuals.

The relationship between technology and social organization requires much more attention in anthropology. Much of the basic technological information we require for any analysis is not available in the literature. Ethnographers have concentrated too much on the relationships within the social structure and the cultural system, and the ecological approach is only just beginning to bring out the importance of the technology of adaptation, as distinct from the mechanics of adaptation, just as it is only recently that the size of the group has been seen to be an essential datum.

Although it is possible to make general statements about the ecology and the organization of nomadic populations, there is wide variation in the details of their ecological adaptation (see Spooner 1972b). Briefly, there are almost as many different types of nomadism as nomadic groups, whereas, at least from the ecological point of view, the cultural ecology of peasants is basically similar. Peasants (that is, sedentary agriculturalists—I use the term for convenience, since all tend to be involved in some way in both agriculture and pastoralism) all improve their environment in basically similar ways. They make an investment in a piece of land that enables them to grow the crops on which they lay the greatest emphasis in their subsistence pattern and in so doing tend to make it similar to other such improved pieces of land. Nomads do not improve their environment and thus do not homogenize it. Therefore, nomadic groups vary widely in the environment they exploit, as they do in the main animal of exploitation, in the patterns of movement entailed, and in the main end product of their pastoralism (for example, cheese, ghee, meat). They also vary significantly in level of affluence and in the degree to which they can in fact specialize in the exploitation of one species of animal. It would seem that only the most affluent nomads are purely pastoral nomads, and a more generally valid stock epithet for nomads would be “multi-resource” (Salzman 1969). Furthermore, nomadic societies are made up of primary social groupings formed for the purpose of efficient herding of the animals. A

combination of factors of individual ownership of the animals and the optimum size and composition of herd leads to a high degree of instability in the composition of the human herding group. Nomadic societies in the Iranian area display only two common features: this basic instability in their primary social grouping and a strong, uncompromising ideology. The latter idealizes the unimproved environment and its efficient exploitation and proclaims both the nobility and freedom of nomadism as a way of life and the despicableness and bondage of peasantry. I have suggested elsewhere (Spooner 1972a) that the strong nomadic ideology may be seen as compensating (*vis-à-vis* the peasants) for the inherent instability of the nomads' primary social grouping.

The agriculturalist owns his agricultural resources as an individual. He owns or has rights to one or more parcels of land and a number of time units of water to irrigate it. The water may come from a *qanat*, a spring, or runoff (controlled by dikes). In the case of the *qanat* he will be involved in a corporate investment interest, but in all three cases he will be involved in some measure of cooperation with his neighbors—at least those who own the immediately adjacent parcels of land—in order to maintain the efficiency of the irrigation and repair irrigation channels and *bands*. The water flow continually erodes and changes the configuration of these and so gives rise both to one of the major causes of disputes in this type of community and to the need for some corporate structure for the settlement of these disputes. However, such corporate structure is generally minimal in this area, and the identity of the village is a function of the unity of the land area cultivated rather than the social or political structure. A man is a member of the village community by virtue of the fact that he owns and works part of that land.⁹

There are a number of jural terms for different types or degrees of rights to land in Persia (before Land Reform): for example *malek*, *ra'yat*, *iqta'*, *tuyul*, *suyurghal*, and *mubasher*. Some have been constant; others have varied and been used in particular historical periods only. Together they constitute the model of the Great Tradition. However, they represent a series of social and political relationships involving rights in cultivation and might be represented more usefully (for anthropology) by a model of four levels from (1) actual cultivator, through (2) local noncultivator, (3) absentee noncultivator, to (4) government. Where all four levels are represented the actual cultivator (1) will typically be a

sharecropper; the absentee noncultivator (3) will take the major share of the produce via his local representative, the local noncultivator (2), but will be expected by the government (4) to pay taxes on it. Where the local noncultivator and the absentee noncultivator are missing, the actual cultivator will be a smallholder, etc. The sharecropper may in some circumstances be the original owner of the land, whose title was usurped when one or another type of tax farmer was set up between him and the government (for example, under the *iqla'* system, see Lambton 1954 and 1967). Further discussion of the political and social organization of the village would require analysis of the pattern of intermarriage that integrates the community and of the oligarchical superstructure that links the villages of each region (cf. Spooner 1965b and Parsons 1964: 161–162).

Although peasants may be considered ecologically homogeneous when compared to nomads, nevertheless from the point of view of group composition, identity, and native models they are quite heterogeneous. There is at least one case in the literature of the Middle East of a village community where the people all describe themselves as “sons of the village” (Peters 1963). But many village communities (including Peters’s) are strongly divided by considerations of class, religion, or other larger classification. In some cases it is difficult to see why and in what way such divisions form one community—why they identify themselves by one name. The proposition that it is simply the distribution of land rights that integrates the divisions is at least worth investigation, but it begs historical questions. The proposition that the identity of a community is in the land that it collectively owns is not new and has been exaggerated. A full analysis would have to seek the evolution of the pattern of land rights, on the one hand, and the evolution of the social groupings, on the other, in any historical material, which may or may not be available.

But given that people identify themselves first as members of their community, what does this mean? Identity is of course relative in that it distinguishes one grouping of people from the rest, and is therefore more clear-cut in the deserts, but the criteria of the distinction may be social or environmental. Village nomenclature is not homogeneous. There are cases where one residential cluster equals two villages. In my experience such cases result from the coresidence of two groups who cultivate

separate land or depend on different sources of irrigation water. In any case no general rules can be drawn up which do not require investigation of the name of the village itself. For instance, is it primarily the appellation of the whole community itself; was it originally the name of one group to whom other groups later attached themselves; or was it the name of a natural feature or landmark by means of which groups living in geographical juxtaposition identify themselves? In other words, is it a purely social or historical, or a geographical, or ecological identification?

The village of Nayband provides an interesting example. It is situated at the foot of a 9,000-foot mountain of the same name in the deserts of eastern central Persia and is very isolated; its history spans at least a thousand years. In the village nearly eighty families huddle together in tall houses of several stories on a crag overlooking their dry riverbed cultivation—historically for reasons of defense against marauding Baluch. A score more families live at other points around the mountain (within a range of forty miles) in groupings of from one to ten families. They identify themselves first as being of the community of Nayband but also have distinguishing names for their particular settlements. They all own land in Nayband village as well as where they are settled. The name Nayband, therefore, in present usage, denotes (1) the main village, (2) the mountain, (3) a community of all the settlements around the mountain. It is now also applied to the lead mine workings some forty miles to the east, which are closer to Nayband than to any other settlement but in a different geographical region. In this case, therefore, the name seems to be elastic and capable of covering any settled activity within an undefined radius of the dominating natural feature.

In all agricultural communities in the deserts and in Persian Baluchistan, membership in the community involves rights to cultivate and irrigate land and/or rights to a share in the produce of that land. The relationship between the social grouping and the environment in which it has made an investment proceeds on the two parallel planes of the individual and the community. Further details of these relationships depend on the choice of crop, which in turn determines the technology of cultivation and the ecological relationships. In the oasis villages I have in mind, the range of crops grown includes rice, wheat, sorghum, dates, and alfalfa. In order to satisfy subsistence requirements each of these crops entails a different relationship with the land, a different level of

investment in terms of engineering or labor, and a different ratio of land to cultivator. Of course, these five crops do not exhaust the total range of crops grown in the area, but they are the most significant in the present context. Rice is the least common. There are villages where all five are grown, primarily in the southern half of Persian Baluchistan. However, for the sake of simplicity and in order to make a point, I shall treat them separately as though any given community was conditioned by the cultivation of only one of the five. Alfalfa is the exception, in that it is of course grown for animal, not human, consumption. The alfalfa grower is therefore a sedentary agricultural *pastoralist* and is interested in agriculture simply as a means of augmenting the feed of his flocks. In effect, within the occupational category of pastoralism he has made the ecological choice to become settled rather than nomadic and is therefore now ideologically a peasant though his primary means of subsistence is pastoralism. The village of Nayband, already mentioned, is a case of this type of adaptation. The people of Nayband grow many other crops besides alfalfa. However, since they were continually subject to raids, and since rainfall is both scant and irregular though necessary for a good grain crop because of the mineral content of the spring water, the production of any crop fit for *human* consumption from wheat, sorghum, or dates was always chancy. Consequently, the tendency was to consider each of them, and especially the dates, as extra feed for the flocks and count them a bonus if good for human consumption. In this situation the ratio of population to resources is obviously very different from that of the ordinary agricultural village, since in fact the agricultural resources are only auxiliary in the economy, even though primary in the ideology.

Nayband is not the exception that it might at first appear. Many other communities, whose subsistence is based primarily on other crops, are ecologically not so different. Variation between rice, wheat, sorghum, and dates is to some extent—but not totally—determined by environmental factors. Rice requires a reliable water supply sufficient to keep it submerged throughout the growing season. Wheat requires a more reliable water supply than the sorghums. The various millets and sorghums have a high tolerance of drought, and the date crop is vulnerable only to severe drought, rain, cloud cover during the ripening season, or severe frost in winter. Sorghum and dates, which have high tolerance of marginal

conditions, are typically dual purpose. When these crops fail for human consumption, they nevertheless provide feed for the flocks. Rice and wheat are highly valued and are the ideal foods in the cultural system. Millets and sorghums are generally considered at best poor-quality substitutes for wheat. Dates are a delicacy when fresh, and in their preserved form they constitute an important staple but are not considered fit food for guests. (These relative cultural values probably derive solely from the Great Tradition of the cities.) It is not surprising, therefore, that wheat is grown at least in small quantities almost everywhere, except where all the land is given over to rice (for although the growing season is different, land used for rice is useless for most other crops). Even rice is grown in many places where, simply on the basis of the water supply, it would not be expected. For, however meager the water supply, it can be entirely devoted to a little rice during the summer months. There is evidence that much more rice was grown as a supplementary summer crop in the past before the introduction of cotton as a cash crop at the beginning of this century.

The most significant difference between these major crops in the context of this paper lies in the relationship between the individual and his land according to which crop is primary in the agricultural cycle. For the crops vary significantly both in yield per hectare (in quantity and in food value) and in the man-hour labor input required to obtain that yield. The extreme case is that of the date palm, which will produce up to 400 lb of fruit per year per tree, with a normal productive life of upward of 75 years. Apart from the organization of irrigation (where necessary), the labor involved is almost negligible. A good tree must be cultivated from a sucker. It will start producing in its fifth year or thereabouts. It must be artificially pollinated in the spring. When the fruit turns color a month before ripening in the summer, care must be taken that it does not fall before it ripens. Finally it must be picked, and the lower fronds should be cut back. One man can easily tend fifty trees and still work only three weeks in the year.

However, though dates may be an important staple, no community lives on dates alone. Date growing is commonly linked with pastoralism. Since most good dates are also grown by peasants because of the irrigation requirements, date cultivation forms one of the most important bridges between nomad and peasant.

Only affluent communities in relatively lush, nondesert environments can afford to specialize in occupation and depend more or less exclusively on one resource, whether pastoral or agricultural. In the deserts every community or social grouping, whether nomad or peasant, is obliged to depend on more than one resource. Each resource that is exploited entails a different technology and a different cycle and constitutes a different niche. In the case of any particular community the cycle and technology entailed in the exploitation of each resource are dovetailed together to form an overall system. Each system will demand either nomadism or permanent settlement, and it is from this distinction that the ideology of the group derives. And the ideology is a determining factor in the external relations of the group. The failure of one resource could change the total system.¹⁰

To summarize briefly at this stage, there are five major products: milk products, dates, wheat, sorghum, and rice. Their production entails a variation in the relationship between society and environment that can be seen as a continuum from a very extensive relationship to a very intensive one. Dates in particular require a low level of investment in the environment and a very low man-hour input of labor in return for a high output. Date cultivation takes up far less of a community's time than does rice cultivation, and it is likely to coincide with lower population density. Similarly, it allows more time and mobility for the exploitation of other resources. At the other end of the scale, rice cultivation requires a relatively high level of investment in the environment to ensure efficient irrigation and a high man-hour input of labor per unit of produce and per unit of land. Rice cultivation, therefore, allows less diversification of resources and requires higher concentration of population. However, it should be noted that rice cultivation and date cultivation are often combined.

Demographic Implications

I am dealing with two modes of society, with nomads and peasants, that are distinguished less by ecological adaptation, or technological specialization, than by the ideological polarization that is generated by their different relationships with the environment. In the Iranian cultural area nomads generally have close relationships with peasants, in some

cases so close that both are included in one tribal structure; but more typically an ethnic distinction is made between the two. In this situation I believe it can be shown that agricultural activity and the size, and therefore the density, of population occupied in it have probably remained close to the capacity possible for the level of investment at any particular time or place—after one allows for certain social factors in the ownership of the land and the restriction of the peasants' freedom to buy, sell, or move. However, the level of investment has varied in response to certain exogenous factors.

Under these conditions nomadism took up the slack in the population. The nomad (in this cultural area) is a cultural satellite of agricultural settlements, markets, and cities, because he needs grain—more than he can grow himself, even if he does cultivate some. There is no independent nomadic cultural tradition. At times of political success the nomad apes the political institutions of the cities. Nomads do sometimes have a tradition of epic poetry, but even where this is composed within the nomadic society, it is in the "courts" of high-status chiefs. Not even pastoralism is a monopoly of nomads. In fact, the most significant cultural criterion for a general definition of the term "nomad" is ideological: a man is a nomad because he says he is. The primary function of this ideology would seem to be that it distinguishes its followers from the inhabitants of villages and cities and gives them an identity that they do not otherwise have.

Ideologies belong to groups, not to individuals. There are several different types of evidence to suggest continual movement on the part of individuals from the nomadic to the peasant life and vice versa (cf. Barth 1960).

If the ideological change is possible, then the technological change from peasant to nomad (or vice versa) need present no difficulty either, since it is likely anyway to be only a change in emphasis. However, it is worth noting here that the movement from peasant to nomad is a move in the direction of technological simplicity.

I am suggesting that on every plane—cultural, ecological, demographic, and historical—nomadism (in this culture area) is secondary to settled agriculture. This would mean that pastoralism must similarly be secondary to agriculture, and I would suggest the following ecological support for the historical validity of this argument. On the Iranian

plateau flocks have to be watered in the same way as agricultural crops—in fact, much more often and regularly. Since flocks have to move to find pasture, they are dependent on supplies of surface water, which are very few and far between. The engineering that produces so much of the available water on the Iranian plateau is the work of settled agriculturalists, but—albeit with some exceptions—pastoralism is as dependent upon it as is agriculture. Peasants increase both the number and reliability of available water sources. Therefore, the spread of settled agriculture must have been a prerequisite for the spread of pastoralism into many areas.¹¹

I found these arguments about the relationship between nomad and peasant in the desert environment epitomized in the situation I studied in the summer of 1969 at Nayband. The village was in existence at the beginning of the Islamic period, when it is described by the early travelers as “possessing a *rubat* or guard-house, with a score of houses round it, water being plentiful, enough indeed to work a small mill. Palms grew here, and many springs irrigated the fields . . .” (Le Strange 1930: 324). Since the occasional European traveler began to visit it in the nineteenth century, it is described as sustaining a similar population to that of the present day:

A picturesque village of about 400 inhabitants . . . It is perched upon a crag. Many of the houses have watch-towers, the position having been chosen entirely with a view to defence against the Baluchis. It has a small stream of good water, but the amount of ground fit for cultivation is very small indeed. Small quantities of wheat and barley are grown; but the principal product is dates. The chief resource of the people is selling provisions to the caravans, which pass through, pilgrims from Kerman going via Tun to Mashhad, and caravans of merchandise going from Yazd and Kerman to Birjand and Herat. The people of Naiband act as guides to these caravans across the desert. Supplies here are only procurable in very small quantities. . . . occasionally the date crop fails, as it did in 1881, when 2,000 date-palms were killed, and others damaged by a heavy fall of snow. Bands of Baluchis wander by Naiband occasionally, and plunder the country towards Tabas, or elsewhere [*Gazetteer of Persia*, n.d., ca. 1900]

The cultivable land around the village is built up into terraces along the sides of the wadis on each side of the rock. There is no sign that more land was cultivated at any time in the past than now. It is difficult to see how any more land could be brought under cultivation. The land

is not nearly sufficient to support the population through agriculture. All members of the village community own land and rights to water for irrigation. Though my data are incomplete, it would seem that agriculture occupies the greater part of the time of those who practice it. But many rent out their plots to neighbors and spend their time on flocks. The mountain is surrounded by desert, and the only pasture is on the high slopes and vales within the mountain. It is a sixty-mile walk around the mountain. The village of Nayband commands all but one of the water sources in the area. The other is situated on a hillside a few miles south in the desert. A thousand years ago it was described as an "outlying spring, surrounded by palms, where there was a domed tank, of evil fame as a noted hiding-place for robbers" (Le Strange 1930: 324), and the description still holds good, except for the dome. Therefore, even though the flocks have to keep moving, they cannot move very far away from the village, and migration is not feasible. Furthermore, the available pasture is unreliable and, in most years, insufficient. Some of the land in the village is therefore given over to alfalfa to supplement the feed of the flocks. Because of the traditional insecurity of the deserts, the people were not willing to make the minor investment necessary for the cultivation of good eating dates, and the extensive palm groves produce fruit that is good for human consumption only when made into syrup. Most of the crop is used to supplement the feed of the flocks. The resulting situation is a community of pastoralists, who for reasons of ecology and simple geography build houses in one defensible place and cultivate in order to support their pastoralism. Ecologically they are nomads in all but the essential ecological adaptation—migration. However, according to the criterion suggested before, they are not nomads because they do not call themselves nomads. Furthermore, their ideology, particularly their attitude toward the environment, is characteristic of peasants, not nomads. It would seem that the very fact of being settled and therefore centered on an improved environment, which is therefore contrasted with everything beyond it, which is desert, is enough to explain the difference. But the interesting point here is that they exploit to the full the agricultural potentiality of the area they control before making up their subsistence from other resources. The primary other resource, which is in fact economically the most important, is pastoralism. In the past the

caravan trade was another important resource, but this is now diverted by the redirection of routes brought about by the advent of the motor age. Finally, migrant laboring, especially in mines, has always played a part.

While knowledge of the technology and ecology of subsistence is basic to an understanding of the distribution of population in the deserts, the overall political situation, depending on exogenous factors, is also relevant. On any particular technological level it is the level of agricultural investment which determines the optimum population in agricultural settlements. Thus it should at least be noted that such investment shows a marked tendency to rise and fall with variations in political stability, which may or may not be related to internal or external population pressures.

The deserts have never contained any town of historical significance. Probably, with the exception of Tabas, and perhaps also Khabis, no single settlement has ever exceeded about 3,000 in population, and few have reached that figure. Since the cities on the periphery of the deserts were bound for their own security to guard their back doors, every named region of the deserts is traditionally appended to one or another of the peripheral cities. In some cases where there is not very much difference in the distance between the area and two or more peripheral cities—for instance, in the case of Khur-o-Biyabanak—it has been appended to one or another of them at different times, according to the relative distinction and political power of each. However, the deserts have never been entirely without internal political centers. And when the adjacent peripheral cities have been weak, the internal centers have come into their own. The nineteenth century in particular was an interesting period for the study of these internal centers. Birjand, Qa'en, Tabas, and Gonabad provide the most significant examples, though unfortunately our information is far from adequate even for these. The typical political pattern in the deserts consists of powerful families in control of forts in the centers of major agricultural regions. The family displays dynastic attributes. For example, it will give its women in marriage only to families that it considers to have a similar status. From the fort a varying hinterland is controlled, according to the capacity of the dynastic family, the alliances it can make, and the surrounding political conditions. Often the family is of tribal origin (see Spooner

1969a: 147–149). In general, there is a definite tendency for the political situation in the deserts to balance that on its peripheries. The desert, therefore, is never a vacuum either politically or demographically.

There are also religious factors contributing to the cultural ecology of the deserts. For example, religious minorities are drawn into the deserts because they are refuge areas. The most obvious case is that of the Bahais in the Boshruya area of Khorasan. The case of the Bahai shopkeepers in the Saravan area of Persian Baluchistan differs, since trade in Baluch society was traditionally conducted by non-Baluch.

Further, religion is significant in the siting of shrines. I have suggested a typology of shrines elsewhere (Spooner 1963: 90) on the basis of origin. From the ecological point of view, there would seem to be two main factors in the distribution of shrines, which in turn influence geographical patterns of human activity in the deserts. Shrines develop either from authentic graves or from what the ancients called the *naturalis deus uniuscuiusque loci*. The former type occurs typically either at settlement sites or on major routes. Great men whose tombs might develop into shrines are unlikely to die elsewhere. Other, “natural” shrines occur at natural features that for some reason attract particular attention in the culture. That is, it is the ecological relationship between the natural environment and the local culture that suggests the site of the shrine. A typical example would be a shady spring in an arid environment or a flat platform atop a rock or mountain in an unusually broken terrain. The appearance and degree of “success” of the shrine then has a feedback effect on the pattern of settlement and communications.

In this enormous area of such low overall population density,¹² it is impossible not to be drawn into the investigation of the apparently easy and ideal distribution of optimum or near optimum population among the resources that their technology allows them to exploit. Technology is obviously the fulcrum, for any change in technology will change the carrying capacity of the environment. But the agricultural technology is not very advanced. *Qanats* were a major technological leap forward, which must have vastly increased the area of cultivable land on the plateau. Unfortunately it is impossible to learn from direct evidence when they were introduced, though it is generally thought to have been well into the first millennium B.C. and possibly connected with the rise

of Iranian political power. But *qanals* are more characteristic of the peripheries of the deserts than the agricultural settlements within them. In either case there has been no other technological innovation since then that would affect either the intensity or the distribution of agriculture until the introduction of cash-cropping, which again is not a factor in the small desert oases.

If the carrying capacity of the environment did not change throughout this period, by what processes was the population regulated? Apart from the movement back and forth from nomadism to peasantry, there would obviously have been pressure from outside the area, which caused new groups to use the deserts as a refuge area. Also there was certainly migration out of the area, in the form of migrant labor, which was both temporary and permanent. Finally abortion appears to have been widely practiced in at least one village (Nayband), where genealogical data allow an average of only two children per family up until, but not including, the present generation.

The data we have suggest the following model in the context of Boserup's hypothesis. When a peasant becomes a nomad, insofar as he forsakes agriculture for pastoralism, he slides down the technological scale. He leaves behind a certain amount of capital investment and makes none in his new situation. He also moves from a situation of dense population to dispersed as well as mobile population. Moreover, he changes from an intensive use of the environment to an extensive use of it. Finally, he moves from a relatively rich (in terms of exploitable resources) to a relatively marginal environment. He leaves his community and makes these changes because of a reduction in resources relative to population—due, usually, to natural catastrophe or hostile activity. Either case is equivalent to population pressure on resources. Therefore, population pressure is forcing people into marginal environments, where in less dense groupings they make a more extensive use of the environment with a lower man-hour input per unit of produce but at a lower technological level. The nature of their new relationship with their environment—a far larger geographical area—requires that they make a much greater investment in the knowledge of that environment, which is in fact what occupies them when (to the outside observer) they often appear idle.

Presumably, in Europe, where the plow and the swidden coexisted

(see Boserup 1965: 57), swidden was primary and the plow was used only where the pressure of population required the increased investment. On the Iranian plateau, however, if the present argument is valid, agriculture—the more intensive land use—is primary, and pressure of population forces people in the opposite direction. Presumably, original movement into the deserts resulted from the same forces, for why should any group move into the deserts if the richer land around them was available?

It would seem, therefore, that oasis settlement must be at least partly due to pressure of population outside the area, and nomadism to pressure of population in agriculture settlements, though the presence of arterial routes and frequent traffic must obviously be relevant to both types of activity. At the other end of the process excess population from the deserts moves into migrant labor and supplies not only the mines but the city proletariat.

Notes

1. This paper constitutes the preliminary progress report of a long-term program for the study of the desert areas of the Iranian plateau. The data, generalizations, and arguments presented here derive from extensive survey work and over a decade of familiarity with the desert areas. Intensive ethnographic inquiry, however, was begun only with a four-month season last summer (1969), during which I concentrated my efforts on the village of Nayband in southwestern Khorasan. Much of the argument has developed from working hypotheses that I formed on the basis of earlier work in Persian Baluchistan from 1963 to 1967 (see Spooner 1969a). In many ways Persian Baluchistan may be considered both an appendage and a microcosm of the desert areas of the central plateau.
2. Sistan, however, is excluded from this discussion. Though located near the center of the plateau, such a considerable area of intensive agriculture, irrigated by a Nile-like river, is too complex to be treated in this context except from the point of view of its external relations and communications.
3. The quantity and quality of the evidence decreases drastically the further back in time we look, and the main sources are present-day observation, ethnographic inquiry, and oral history. However, there is a great deal of literary evidence in the form of scattered chance data in Western travel accounts (back to the sixteenth century), medieval histories and geographies, and reports of the early Muslim travelers. Furthermore, there is the evidence of archaeological deposits and the linguistic evidence of the toponymy. The exploitation of each of these sources has just begun, but enough has been done to demonstrate the potential (cf. Spooner 1965a, 1969b, 1970, 1971a; Wertime 1964, 1967).
4. The advantage of sand is that, when precipitation does occur, it supports pasturage. The most important disadvantage is that it greatly slows or prevents communication.
5. Many springs are thermal. Many more are saline, sulfurous, or otherwise nonpotable.
6. *Qanats* are tunnels that bring water from the water table onto fields by gravity flow. For technological details consult English 1968.

7. This may be in the form of *waqf*, religiously institutionalized good works for the benefit of the community, see *Encyclopaedia of Islam*.
8. The common elements of dialect may to some extent be due simply to the preponderance of men from one place—Anarak—in positions of relative responsibility in mining enterprises throughout the deserts.
9. There are, however, also cultural considerations. When an outsider acquires rights to land in a village, he is not necessarily accepted straightaway as a member of the community, even if he works the land himself (cf. the case of Deh Salm in Spooner 1971b).
10. More general details of agricultural technology may be found in English 1966: 117–124.
11. It should be noted that I am dealing in this chapter primarily with an area where agricultural, peasant values are dominant. In an earlier article (Spooner 1969a) I showed how in Baluchistan nomads appeared to have taken over a peasant society, leaving a situation where nomadic values were dominant, although the nomadism was still secondary.
12. Unfortunately there are no figures, except for individual settlements, and these are unreliable.