Glimpses of an Iron Age Landscape

Plants at Hasanlu

MARY VIRGINIA HARRIS

On an August evening in 1970 A.D., standing on the top of Hasanlu Temple, I could see the highlights of the reapers moving back and forth across the wheat fields. Few individual farmers or even villages in Iranian Azerbaijan could afford to buy such a machine. Instead, a family or community would arrange to rent one, and this meant that maximum use had to be extracted. So day and night the reapers moved over the ripe grain.

What would I have seen had I stood on the flat mud roofs of the buildings on the same mound 2800 years ago? The creators of the handsome Iron Age enclaves—often by 4000 years or more in 800 B.C. when the city was destroyed—left no written records, no painted pictures, no sculpted reliefs. We do not know their name or the name they gave to this man-made hill now called Hasanlu. We can, however, make some inferences about the landscape that surrounded them based on information provided by botanists and by archaeologists.

The Modern Landscape

Iran is a plateau, forming a watershed between the Arctic and Indian Oceans. The eastern edge of the plateau is encircled by mountains, while the interior contains vast deserts. The northwestern part of the plateau, modern Azerbaijan, is broken, mountainous terrain with relatively recent volcanoes (Fig. 1). The rivers within this region drain east into the Caspian Sea or into a central depression, covering an area of about 50,000 square km, that contains Lake Urmia. This large lake (140 km long, 15-50 km wide) has no outlet, and is fed by streams that flow through gypsum and volcanic deposits with soluble salts. As a result, the highland Urmia at 1200 m above sea level is saltier than the Dead Sea, lying at 392 m below sea level. Because of its salt content, Urmia has never been known to freeze, although the air temperature has been known to drop well below zero Centigrade.

Just to the south of Lake Urmia, separated from it by a low ridge, lies the Sardus valley (Fig. 2). To the west lies the Kelish pass that leads through the Zagros mountains into ancient Assyria (modern Iraq). Flowing down from these high ranges is the Sardus river, which provides abundant water within the Ushna and Sardus valleys, then eventually subsides into salt flats along the shore of Lake Urmia (Fig. 3). The Sardus valley is much richer in water sources than the surrounding plains. In addition to the Sardus, it has three small freshwater lakes located to the north and east of Hasanlu Temple, and large marshy areas that are flooded in the winter and spring (Fig. 5). The seasonally flooded land, as well as the lake shores, support grasses and plants even during the hot dry summer months (Fig. 4).

Climatic information has not been systematically collected in the Sardus valley itself, but temperature and rainfall should be similar to that of the town of Urmia to the north, which receives an average of 270 mm (over 14 inches) of precipitation per year. Maximum temperatures in July and August are around 32°C, while a minimum of -4°C is normal in January. During the winter, snow falls in the surrounding mountains, but the valley floor usually remains snow free (Voigt 1983 with refs.).

1 View of the Sardus valley in mid-summer, when harvest has begun. The low slopes are planted with wheat and barley, grown without irrigation. In the foreground are members of the water family, flourishing on the disturbed ground next to the modern road.

2 In the Ushna area, valley bottoms remain relatively free of snow even in winter. This view, taken in December, shows the Ushna valley (center) as a dark streak amidst the snow-covered Zagros mountains. The high ranges divide modern Iran and Iraq. (Photo courtesy of M.M. Voigt)
The Ancient Landscape

Modern vegetation patterns throughout the world are the product of thousands of years of human use and abuse. To reconstruct plant types and their distribution in the distant past, we rely on modern botanical observations coupled with evidence gathered by paleobotanists and archaeologists (see box). These sources have provided information on both the wild and cultivated plants of Sodruz valley during prehistoric times.

Iron Age Wildflowers

If we had walked across the countryside surrounding Hasana in 800 B.C. I would probably have seen many of the same wild plants that I found in the 1970s, or at least their close relatives. Some groups of hardy wildflowers that require temporary water have been present in the region continuously since glacial times. This conclusion is based on a study of fossil pollen taken from sediments at the bottom of Lake Urmia that date from 9000 to 3600 years ago, the time of Hasana’s occupation (Bottema 1989).

Among these persistent plants are early blooming, colorful field flowers. Most of them are considered scrubby and uninteresting today, and the wild forms are rarely grown in modern gardens. In Sodruz they are found as weeds in cultivated plots and neglected by farmers, such as roadsides and rocky slopes (Fig. 8). Many of these plants form a Compositeae family, a vast group found worldwide. It includes daisy, thistle, thistles, asters, and other varieties, all characterized by blossoms that are composed of many small flowers molded into one head (Fig. 7). I have seen members of three Compositeae genera in Sodruz: Achillea, Centaurea, and Senecio.

The best-known member of the genus Achillea is the yarrow (Achillea millefolium). At least one species of Achillea (Fig. 9) has been reported from the Zagros mountains to the west of the Sodruz valley in modern times (Cuest et al. 1968-85). A. ageratum, which I found in Sodruz, has clusters of yellow heads with few rays.

The genus Centaurea, the knapweeds, encompasses many of our favorite flowers: bachelor’s button, daisy, dandelion, and cornflower. A common plant in the Sodruz area today is C. solstitialis, better known as Barnaby’s thistle. It has a yellow innocence with yellow spines protruding from the bracts (Fig. 15).

The groundsel or ragwort (genus Senecio) are one of the largest in the Compositeae genera, with about 1200 different species in many colors. In Sodruz I found Senecio sagitulus (Fig. 10). A daisy-like flower with three or four yellow heads branching off the main stem, it is often mistaken for a dandelion (Taraxacum). The most refined and cultivated member of this genus today is probably the cineraria.

In the Iron Age as now, members of the dandelion family (Malvaceae) would have stood tall on the landscape and attracted the eye (Figs. 9, 11). These flowers occur in many colors: pink, lavender to purple, pale yellow, and white. The color of a particular plant is determined by soil conditions, so that in Iran I could photograph lavender mallows on one side of a hill, but across the crest I would see only white flowered ones.

Ubiquitous along every roadside in Azerbaijan today is Cichorium intybus, chicory (Fig. 14). Its loaily blue flower closes by noon, but brightens the landscape wherever it appears. This plant tends to grow on disturbed soils favored by the cereals, but it requires even less moisture. Its deep root system makes it hard to eradicate, so its seeds have mixed with harvested grains and in this way traveled worldwide.

Sedges and Grasses

Sturdy sedges and grasses from wetlands are used in many ways in modern villages in the Middle East. For example, they serve as an essential building material, a raw material for the manufacture of mats and baskets, bedding for animals, and fuel. As experienced, it is therefore hardly surprising to find that seeds from these plants have been identified in a preliminary study of the Havala Iron Age flotation samples (Test 1975).

Sesamum is the family name used for the ruses or sedges. They may be thick stemmed when grown in dunes, sand, or wind, across areas that were neglected by farmers, such as roadsides and rocky slopes (Fig. 8). They are found today along the edges of the small freshwater lakes in the Sodruz valley, as well as in dense stands along the southeastern shore of the valley. These plants can be cut, interlaced, and massed to form a band for a mud roof, but where stout reeds are available, sedges are unlikely to be preferred for this purpose.

Phragmites communis, the common reed, is ubiquitous worldwide. Great plots of it with its feathery heads are found today near Hasana, and in uncultivated areas in eastern Sodruz (Fig. 4). These plants are gathered, used for thatching, and used as screens or in roofing. Impressions in mud or clay of round Staten are one of the few certain sites of craft production in Sodruz. Clusters of yellow spines protruding from the bracts (Fig. 15).

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Table 1

<table>
<thead>
<tr>
<th>Species</th>
<th>Common Name</th>
<th>Identified Uses at Hasana</th>
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</thead>
<tbody>
<tr>
<td>Acer</td>
<td>Maple</td>
<td>Construction Beams</td>
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<tr>
<td></td>
<td></td>
<td>Mace shaft</td>
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<tr>
<td></td>
<td></td>
<td>Small carved object</td>
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<tr>
<td>Buxus</td>
<td>Box</td>
<td>Furniture</td>
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<tr>
<td></td>
<td></td>
<td>Walnut</td>
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<td></td>
<td></td>
<td>Small carved object</td>
</tr>
<tr>
<td>Cedrus</td>
<td>Cedar</td>
<td>Hawthorne</td>
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<tr>
<td></td>
<td></td>
<td>Bowl</td>
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<td>Cistus</td>
<td>Cypress</td>
<td>Sculptured head</td>
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<tr>
<td></td>
<td></td>
<td>Furniture</td>
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<td></td>
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<td>Walnut</td>
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<tr>
<td></td>
<td></td>
<td>Small carved object</td>
</tr>
<tr>
<td>Nutans</td>
<td>Prunus</td>
<td>Almond, peach</td>
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<td></td>
<td></td>
<td>Furniture</td>
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<td></td>
<td></td>
<td>Spear shaft</td>
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</tbody>
</table>
5 In the Sollux valley are shallow freshwater lakes that expand with the spring rains and contract during the dry summer months. They are visited annually by migrating birds, including flamingos. (Photo courtesy R.H. Dyson)

6 (above) Herds of domesticated animals, such as sheep, goats, cows, and water buffalo, form an integral part of the agricultural economy in the Lake Urmia basin today. During the dry summer months, seasonally flooded land remains green and is good pasture. Villagers sometimes establish temporary camps in such pastures, such as this one next to the River Gadar. Other summer pastures are located next to the freshwater lakes, and in a low-lying area to the southwest of Hasama. (Photo courtesy M.M. Voigt)

7 (left) Thistles are one of the most common wildflowers in the Ushnu-Sollux valley in late summer, protected from grazing animals by their spines.

8 (above) At present, wildflowers are found in marginal areas that cannot be cultivated. Here mallow and mallow species on a pebbly slope.

9 Wild flowers such as yarrow (Achillea) often grow in fields of wheat (shown here) or barley.

10 Groundsel or Senecio is frequently mistaken for dandelion, but is a relative of the composites.

11 Members of the mallow family vary in color, depending on soil conditions. This example was photographed in the Sanandaj valley to the south of Sollux.

12 (right) Some low-lying areas in the Sollux valley are still covered with dense stands of rushes, which flower in mid-summer. Shown here is Butomus umbellatus.

13 (left) Members of the Composite family can grow in relatively dense stands. These yellow thistles (tentatively identified as Centaurea or Carthamus) thrive in a field near the freshwater lake Shur Gol. (Photo courtesy M.M. Voigt)

14 The ubiquitous chicory (Cichorium intybus) grows on disturbed ground, such as fields and road sides.
semperiseraea or box tree, which grows in the Caucasus, Anatolia, and the humid forested area to the south of the Caspian Sea. A bronze macaque comprendur boxwood handle was found in the great hall of Burned Building II. From Burned Building VII came fragments of objects carved of boxwood. These may represent pieces of furniture, since the name "Boxwood Age" at Cordium in central Turkey were made of boxwood inlaid with juniper and walnut (Simpson 1993).

The Food Crops of Hasanlu

Reconstructing Ancient Landscapes

The most useful information for those interested in ancient environments comes from pollen samples, larger plant parts (especially seeds), and artifacts that can be associated with the collection, cultivation, and use of plants by people. Each of these kinds of material requires a different method of collection and analysis; each also has distinct advantages and drawbacks, depending on the problem to be examined.

Pollen samples can provide a vivid and relatively precise picture of the vegetation within a region and its change through time. The tiny grains have a hard coat that resists decomposition, although pollen is eventually destroyed by alternating wet and dry soil conditions. Thus only small quantities of pollen are ordinarily recovered from archaeological sites. Better conditions for preservation prevail in waterlogged soils, which exclude oxygen and inhibit the decay of organic materials (The acidic conditions that may occur in waterlogged areas destroy bone, but do not harm pollen). Techniques for recovery are relatively simple, utilizing a coring or Age strata, a trowel or spoon to collect small quantities of soil from sites under excavation. All samples must be sealed immediately in order to protect them from possible contamination by modern airborne pollution. In the laboratory, soils are chemically washed and the pollen grains are collected on glass slides for examination under a microscope. Using the shape of the grains and patterns on their outer surface, an identification can be made at the level of family or genus, but rarely at the species level. Depending on the problems we wish to examine, this degree of precision may or may not be satisfactory. For example, palynological research provides valuable information on the forest cover of the Urnian basin. Sparse pollen grains in the Urnian core indicate that trees were rare in the region around the lake (including the Sodruz valley) before about 9000 years ago. After temperatures and moisture had increased at the end of the last Glacial period, pollen from Pistacia (wild pistacia), Betula (birch), and eventually Pinus (pine) and Quercus (oak) was deposited. Because we are focusing on a major change in ecology, the exact species of pine or oak represented is less important than identification of forest trees. On the other hand, palynology cannot answer a question of considerable interest to archaeologists: when did people begin the cultivation of cereal crops in northwestern Iran? Although the Urnina core shows an increase in pollen from cereal grains at the end of the Pleistocene, this type of pollen grain is brought by a large group of plants, including not only wild and domesticated legumes and wheats, but also other grasses.

The answer to this and other questions is based on the ways in which pollen exploded plants rest not on palynology, but on the study of "charred" remains, those those visible to the naked eye—such as seeds, stems, and wood. Many ancient remains recovered from archaeological sites are usually charred, since uncharred specimens are subject to decay under the soil conditions present at most sites. (Exceptions would be waterlogged archaeological sites.) Occasionally, large deposits of seeds and plant parts are found concentrated in the sediments as a result of a fire. Carbonization during food preparation. More often, the charred seeds are scattered in the soil and are difficult to see, much less recover during excavation. In order to collect minute and dispersed seeds, a method called flotation was developed during the 1930s and became widely used during the 1970s. The flotation process utilizes the principle that plant parts have a lower specific gravity than particles of soil; if a bucket of soil containing bits of charred plant material is placed in water and stirred, seeds and charcoal will be separated from the rest of the deposit, and will float to the surface where they can be scooped up and saved for later study (Fig. B-3c). The archaeobotanists, or specialists in the study of ancient plant remains, examines macroscopic samples under low magnification and provides identification based on plant form. These identifications are often at the genus level, and sometimes even species can be determined. Most of our knowledge of the process of plant domestication and agriculture comes from this type of research.

Artifacts can sometimes give valuable information about the specific kinds of plant-related activities that people performed. For example, "sickle blades," chipped stone tools with edges that are shiny (coated with a thin layer of opal), tell us that their owners were harvesting some kind of sili- cous grasses. Whether these were wild plants or crops cannot be determined from the tool itself. However, ceramic vessels can sometimes be identified as cooking pots or storage jars (Fig. B-4), but these kinds of foods prepared and stored can usually be determined from macro- scopic remains found in the same archaeological contexts. Thus for the archaeobotanists, artifacts are a supplementary rather than a primary source for the study of ancient environments and plant-based economies.

Mary M. Voigt
16 (above) Trees are a garden crop in the Ushun-Solduz valley, requiring irrigation. Here poplars stand behind a field of onions.

17 (left) Stub of a carbonized wooden column on a stone base, found in a storage room in Burned Building V. Larger examples are found in the columned halls. (Photo courtesy of the Hasunlu Project)

18 Agriculture in the Ushun-Solduz valley during the 9th century B.C. was probably similar in many respects to that of the present, and closely linked with the herding of domesticated animals. Here, in one small area of the valley bottom, three different irrigated crops flourish side by side. At the left and center are groves of poplars, groves today as a source of cash. Next to the poplars is a fodder crop, to be stored by the farmer as winter food for domesticated animals. In the foreground, a harvested field of wheat clearly shows the grid pattern of shallow irrigation ditches. The cereal stubble provides summer fodder for herds of sheep, goats, and cattle, whose droppings fertilize the field and prepare it for next year’s crop. The shepherd’s tent has a goat-hair roof and reed-mat walls. (Photo courtesy M.M. Voigt)

19a-c Traditionally, sheiks with flint or metal blades were driven over piles of wheat to thresh it (a). The grains were separated from chaff and straw by throwing the threshed cereal into the air (b). The straw is a valuable product, used as animal fodder and, mixed with water and mud, as the raw material for mud bricks. Huge piles of straw are stored on the roofs of villages houses (c).

20 (left) Cultivated barley, with pea occurring as a weed.

21 (right) Quince is used today for jams and meat dishes. Fruit stews are an important part of the menu in Azerbaijan, and are also made with apples, peaches, and apricots.

22 (left) Grapes are an important crop in modern Solduz. The vines are trained over earth ridges, and at Hasunlu, several vineyards have been created by cutting trenches through the lower part of the archaeological mound (center). To the left of the vineyard is the modern cemetery and to the right is the undisturbed mound, deposited in the Bronze Age. The tall slender trees are poplar, but the low rounded trees to the left are willows, growing along an irrigation canal.
Vegetables

Members of the legume or pea family (Leguminosae) were an important part of the harvest in Iron Age Hasanlu. Lentil (Lens esculenta), chickpea (Cicer arieti- num), and horsebean (Vicia faba) were probably staples in the human diet, while bitter vetch (Vicia ervilia) is more likely to have been used as animal fodder.

Chickpea, a valuable crop for farmers in arid lands because of its resistance to drought. The unirri- gated fields on the slopes to the north of Hasanlu were often planted with chickpea in the 1960s and 1970s. In the Iron Age Citadel, chickpeas were found in a kitchen that probably served as a kitchen in Burned Building III. It can be used in a variety of ways: roasted and eaten as a snack; brewed as a beverage; and stewed with other vegetables and meat. Today, the cooks of Azerbaijan are said to make the best aghdagh (lamb stew) in all of Iran, and chickpeas are a basic ingredient.

Fruits

The importance of grapes and figs is deeply rooted in Near Eastern tradition. The Sumerian epic "Enuma elish" and the Lord of Aratta" joins grape and fig as symbols of fertility. In this story, the Sumerian hero Enmerkar demands precious metals, lapis lazuli, and craftsmen from the Lord of Aratta. The latter finally agrees, providing the people of the city of Uruk present grapes and figs to her temple. Although the location of Aratta is unknown, the journey of the Mesopotamian envoy to arrange this "deal" led past the city of Suna in southwestern Iran and over mountains. It seems likely, therefore, that Aratta lies somewhere on the Iranian plateau.

This tale is dated to the early 3rd millennium B.C. Over two thou- sand years later, in a jar full of figs and grape pits (Pipta carica, Vitis vinifera) was found in Burned Building III in a room that may have been a kitchen. In the same room, what seems to have been a string of figs was found in a copper/bronze basin with iron handles. Fragments of Vitis vinifera from the great hall of Burned Building II were identified as carbonized rambutis. Today the mound at Hasanlu is unroofed and (even cut away) by vineyards, and grapes are likely to have been a local product in the Iron Age as well (Fig. 22). The figs, on the other hand, may have been imported, since this plant requires an annual rainfall of 86-122 cm, more than double the amount estimated for the Sefidzah valley. Both grapes and figs are easily preserved by drying and are very easy to transport.

Evidence for the presence of quince, the earliest fruit tree to bloom, was found in both Burned Building II and III. The flowers of Cylindra oblonga appear before the leaves and are one of the har- bingers of spring (Fig. 31). The fruit is not treated kindly can puck- er the lips, but modern Persian cooks are adept at preparing delici- ous dishes using the quince, or beh (Persian). Quince sliced and combined with meat, onions, and yellow peppers (khoreh beh) is very popular; cored and stuffed with meat and vegetables (dolme beh), the quince is to be found at the fanciest dinners. Tentative identi- fication of fragments of pear (Pyrus communis), apple (Pyrus malus), and a variety of Prunus (possibly apricot or almond) suggests the great variety of fruit that was consumed at Hasanlu in the past all of these would have been wild varieties rather than cultivated. Nuts from one variety of wild almond (Prunus dulcis) are still sold in the bazaars of Iran, and it is possible that they were eaten as eagerly in 800 B.C. as they are today.

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2800 Years Ago

Using a variety of sources and methods, we can now present a vivid reconstruction of the landscape to be seen in the 9th century B.C. from the top of Hasanlu. In the low and damp areas lying to the north, plumes of reeds and sedges would have formed waves bent by the prevailing northwest winds. There would have been stands of wheat and barley with tall colorful stalks of mallow in their midst, and around the field edges, some yellow ragwort inter- spersed with spiny thistle and twining vetch.

Near the town, in areas more easily guarded, might be vineyards and groves of poplar trees fed by water led from the river to the south. In the far distance, scattered trees might be visible on the hillsides, marking the course of small streams or springs. And looking closely one might have seen small spots of color—willowscattered in fields as well as pasture lands. I would have felt right at home in that lovely Soltuz valley.