PHYSICAL AND CULTURAL ENVIRONMENT OF UTAH LAKE AND ADJACENT AREAS

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ABSTRACT.— Utah Lake and its surrounding area have a rich natural and cultural background. The moderate climate, abundant fresh water, and fertile soils of Utah Valley made it an oasis to aboriginal dwellers as well as to the present inhabitants. An overview of the physical setting, geology, climate, human use, and recent history of Utah Lake is presented.

PHYSICAL SETTING

The basins and ranges of the Great Basin in the western United States have as their eastern border in central Utah a fertile valley rimmed by majestic mountains containing one of the largest freshwater lakes west of the Mississippi River. This lake, known as Utah Lake, occupies over 25 percent of the valley floor, and, even though it covers about 38,075 ha (150 mi^2) and contains approximately 1100 × $10^6 m^3$ (870,000 ac-ft) of water, its average depth is only 2.8 m (9.2 ft). The major perennial streams that feed the lake have their headwaters in the Wasatch and Uinta Mountains to the east. They are from north to south the American Fork River, Provo River, Hobble Creek, and Spanish Fork River. There are also a few minor perennial streams, many intermittent streams, and numerous springs and surplus water from pumped and flowing wells that add to the lake's volume. The total natural catchment area that drains water into Utah Lake is about 5957 km^2 (2300 mi^2). Demands for irrigation water in Utah Valley result in additional water entering Utah Valley from the Weber River, Duchesne River, and Strawberry River via diversion canals and tunnels. The annual surface flow into Utah Lake from all monitored sources is slightly over 640 × $10^6 m^3$ (520,000 ac-ft) (Hudson 1962:75). Location of the major surface streams that feed Utah Lake are shown in Figure 1. The Jordan River flowing into the Great Salt Lake is the sole outlet of Utah Lake.

The mountains that rim Utah Valley rise rather abruptly from the valley floor, reaching altitudes of about 457 m (1,500 ft) to nearly 2,286 m (7,500 ft) above the 1,368 m (4,489 ft) lake surface. In the lower parts of the valley a semiarid climate is found, but it gives way to wetter and cooler conditions higher up the mountain slopes. The highest peaks are well above timber line, but perpetual snow and ice are not found on any nearby mountain summits. Some snow banks remain from one year to the next, but most of these disappear during the average summers.

The different climatic types are reflected in the native vegetation zones from the valley floor to the mountain summits. Sagebrush and grasses dominate the lower areas, giving way to mountain brush, juniper and aspen, next to coniferous trees and eventually alpine grasses, and then sedges in the highest places. Trees and other riparian vegetation are found along most water courses, but much of the shore of Utah Lake is devoid of trees. The shallow margins of the lake contain a variety of vegetation, with Provo Bay being dominated by rushes and cattails.

Since settlement of the valley by people of European ancestry, most of the area has been transformed into cultivated land, cities, and towns. Of all the Great Basin valleys, Utah Valley is the most agriculturally productive. The mountain slopes still contain some natural vegetation, but man's activities have altered the area considerably. Dust storms occasionally add considerable particulate matter to the atmosphere, but man-made pol-

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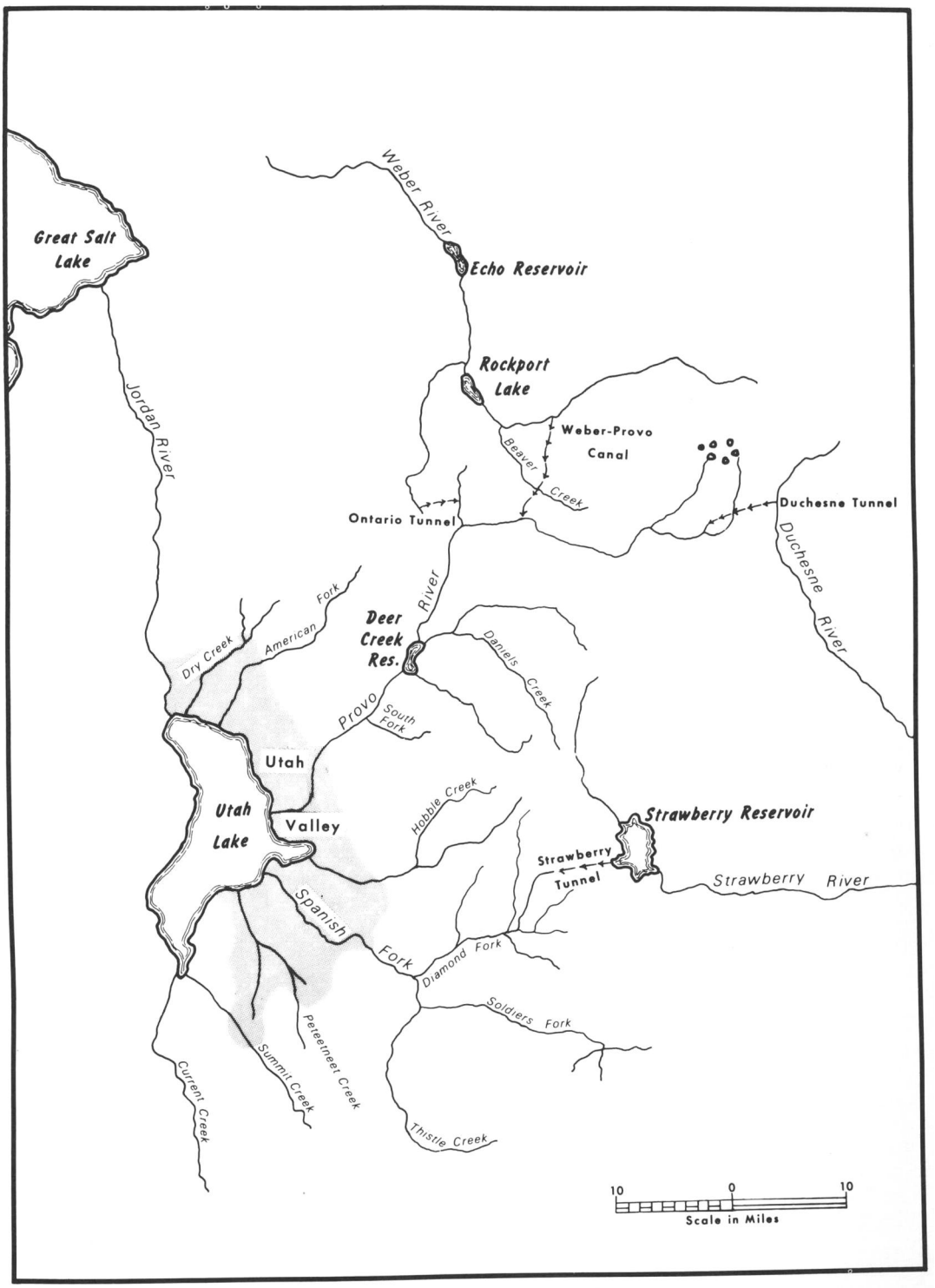

Fig. 1. Utah Lake drainage basin.

lutants tend to create a near-permanent haze over the valley, especially in winter months.

The name *Utah* (after the Ute Indians who were occupying Utah Valley when the first settlers came to the area in 1847) was first given to the county and the lake before it was applied to the territory and ultimately the state in 1896.

Geologic Origins

For the last 70 million years crustal stresses, marine erosion and deposition, and volcanic activity have all added to the character of the existing landscape. The Rocky Mountain system, including the Wasatch Range that borders Utah Valley and Utah Lake on the east, had its beginnings when two large sections (plates) of the earth's surface were forced together causing the existing sediments to be lifted to lofty mountains. This crustal deformation occurred over several million years, with periods of relative calm and downwear between the tectonic activity (Brimhall 1973:121).

About 35 million years ago volcanic activity, centered north and south of Utah Valley in the Tintic and Oquirrh Mountains, resulted in mineralization of these areas (Hintze 1973:80). Today the major mining districts of central Utah are centered in these areas. As time passed, further stresses caused blocks of the earth's crust to be uplifted and downfaulted. These uplifted blocks form the present mountains of the Basin and Range Province, with the Wasatch Mountains being the easternmost of the group. Many of the intermountain basins, such as Utah Valley, are downfaulted (grabens) and are filled with more recent marine and alluvial deposited sediments.

A distinct feature of the local block faulting is the high angle of the faults, which have created rather abrupt mountain fronts. Debris eroded from the uplifted ranges have gradually filled in the intermountain basins until today these sediments have accumulated to thousands of feet in depth in many basins. Perhaps the most unique aspect of the local faulting is the presence of numerous triangular faceted spurs in the proximity of the Wasatch fault zone. Interfluve ridges of the Wasatch Mountains that would normally extend to the valley floor are interrupted by recurrent fault lines at right angles to the ridge. Resulting faceted spurs or "flatirons" usually exist in somewhat of a hierarchy, with the largest and oldest occurring farther up the mountains from the smaller more recent triangle facets near the base. Maple Mountain to the east of Mapleton is a prime example of these faceted spurs.

The flatness of the floor of Utah Valley is due to lacustrine sediments of a much larger lake than Utah Lake. This large lake, known as Lake Bonneville, occupied much of western Utah until about 8,000 BC. It was one of several Pleistocene lakes in the western U.S. Some of the most conspicuous landforms in the vicinity of Utah Lake are the remnant terraces left by this ancient lake that probably began filling the valley about 75,000 years ago (Bissell 1968:11). Fluctuations in the level of the lake, caused by climatic changes, resulted in the formation of distinct terraces or benches on the mountainsides where the shoreline remained long enough to etch out and deposit beach sediments.

The first high level of the lake was at 1,555 m (5,100 ft) and is known as the Alpine Level (Bissell, 1968:3). The lake probably remained at this level for several thousand years before rising to 1,565 m (5,135 ft) due to wetter conditions. The water continued to rise to at least 1,585 m (5,200 ft) with the capture of the Bear River to the north, then spilled over through Red Rock Pass in southern Idaho into the Snake River. After tremendous volumes of water pushed on through the Snake and Columbia Rivers, the lake stabilized at the 1,463 m (4,800 ft) level (Bissell 1968:3). It was during this period that large deltas were built into the lake by the major inflowing streams, creating the "bench land" of eastern Utah Valley. This level has been designated as the Provo level.

As time passed, drier and warmer conditions prevailed and evaporation rates began to exceed the inflow rates, resulting in a decrease in size and, eventually, a separation into at least two distinct lakes. What is now Utah Lake remained as a temporary catchment basin for fresh water entering the larger Great Salt Lake via the Jordan River.

Layers of sand, gravel, silt, and clay underlay Utah Valley and correlate with several glacier periods when Lake Bonneville cov-

ered the area. Most of the gravel beds are associated with deltas and alluvial fan deposits that are adjacent to the mountain front. Silts and clays are more common in the central part of the valley (Brimhall 1973:2). The accompanying maps from a recent study (Figs. 2 and 3) show the general character of the lake bottom and the surrounding geology (Jensen 1972:41, 46). Because of the position of Utah Lake in the western part of the valley, its eastern shore is mostly poorly drained and has a gentle slope, but most of the western shoreland rises rapidly as the eastern front of the Lake Mountains.

Weather

The factors that account for the type of weather conditions and ultimately the climate in the vicinity of Utah Lake are:

1. Its inland position is 1,050 km (650 mi) from the Pacific Ocean and about 1,850 km (1,150 mi) from the Gulf of Mexico.
2. Its elevation above sea level is about 1,372 m (4,500 ft).
3. Its position is adjacent to the abrupt, sloping Wasatch Mountains.
4. The prevailing winds of the area are westerly.
5. Frequent frontal contact of polar and tropical air masses with accompanying cyclonic storms are experienced.

Because of the interaction of these factors, the precipitation in the vicinity of Utah Lake is relatively light, there is a wide variation in temperature, the relative humidity is normally low, there is abundant sunshine with some exceptions in winter and spring, and winds normally blow from the west to northwest, although there are frequent deviations from this direction. Early morning canyon downslope breezes move into the valley, especially from Provo and Spanish Fork Canyons. Advection fog often occurs in the winter months near the shore of Utah Lake and other lower portions of the valley. Snow depths in winter may reach up to 30 cm (11.8 in), with total snowfall averaging about 1 m (3.3 ft) per year. In 1972 Spanish Fork recorded a record total of 3.72 m (148 in) of snow. Snow depths are usually greatest in this southern part of the valley.

Although winds in excess of hurricane velocity (121 kph or 75 mph) are not common, they occasionally occur but are not associated with the tropical hurricanes that invade the southern coast of the U.S. Tornadoes are rare in Utah, but normally one or two are sighted per year in the state. None have been officially reported in the vicinity of Utah Lake. During the summer months dust devils (whirlwinds) carry dust and other debris into the air, but they rarely cause any damage. Winds blowing off the deserts to the west often bring with them considerable quantities of dust, which give a haze to the valley. If a rainstorm follows one of these dust storms, muddy rain can be expected.

Of all the elements of weather, precipitation and temperature are usually considered most important to the biotic community that is dependent on favorable quantities of each. Each of these will be discussed briefly.

Precipitation

The influx of moist air into the Utah Lake area usually originates over the Pacific Ocean during the winter and spring months and moves in with cyclonic storms usually originating in the Gulf of Alaska. These frontal storms are normally short-lived but occasionally result in more than 2.54 cm (1 in) of precipitation. As a cold front passes, the wind will normally shift from the south to the north. There is an obvious decrease in temperature, with gusty winds and rain or snow for several hours before the storm moves eastward and out of the area. Nearly 60 percent of the total annual precipitation occurs in the late winter and early spring, with March being the wettest month (Utah Climatological Data, 1950–1975).

The storm track moves northward during the summer months, and the change in pressure patterns allows moist air to move in from the Gulf of Mexico. Because of the relatively high temperatures of summer, convectional storms are more common than frontal storms. Thunder and lightning accompany the large cumulonimbus clouds, which may drop heavy amounts of rain and/or hail. Hailstones are usually less than 1 cm (0.4 in) in diameter. August is the wettest summer month, with receipts averaging about 2.54 cm (1 in) (Utah Climatological Data, 1950–1975).

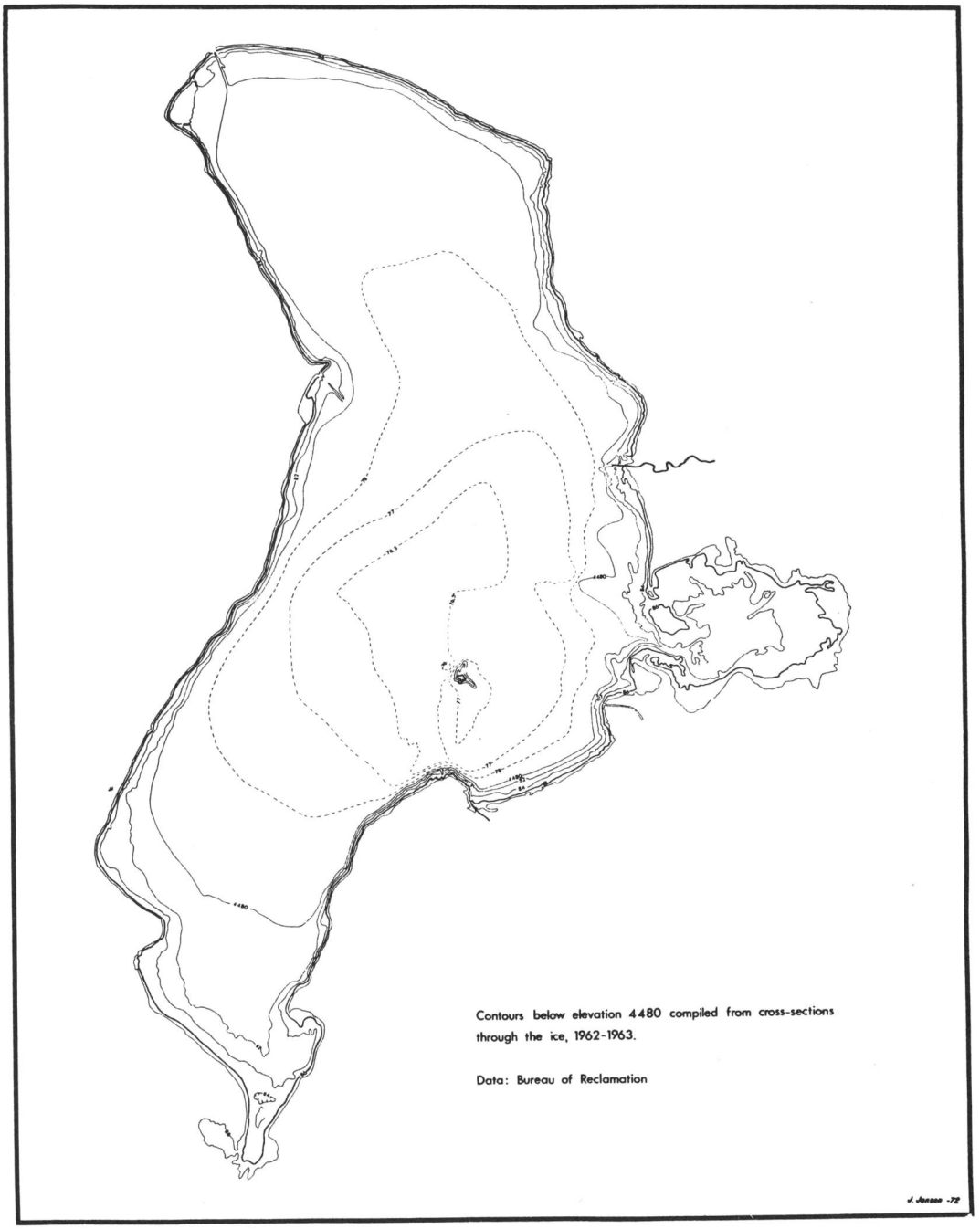

Fig. 2. Utah Lake topography.

During an average year, total precipitation varies from just over 23 cm (9 in) near the eastern shore of Utah Lake at the Geneva Steel Plant to over 45.7 cm (18 in) at Santaquin near the southern shore of the lake. In the nearby mountains, receipts averaging up to 127 cm (50 in) per year are common and are major source areas of Utah Lake water.

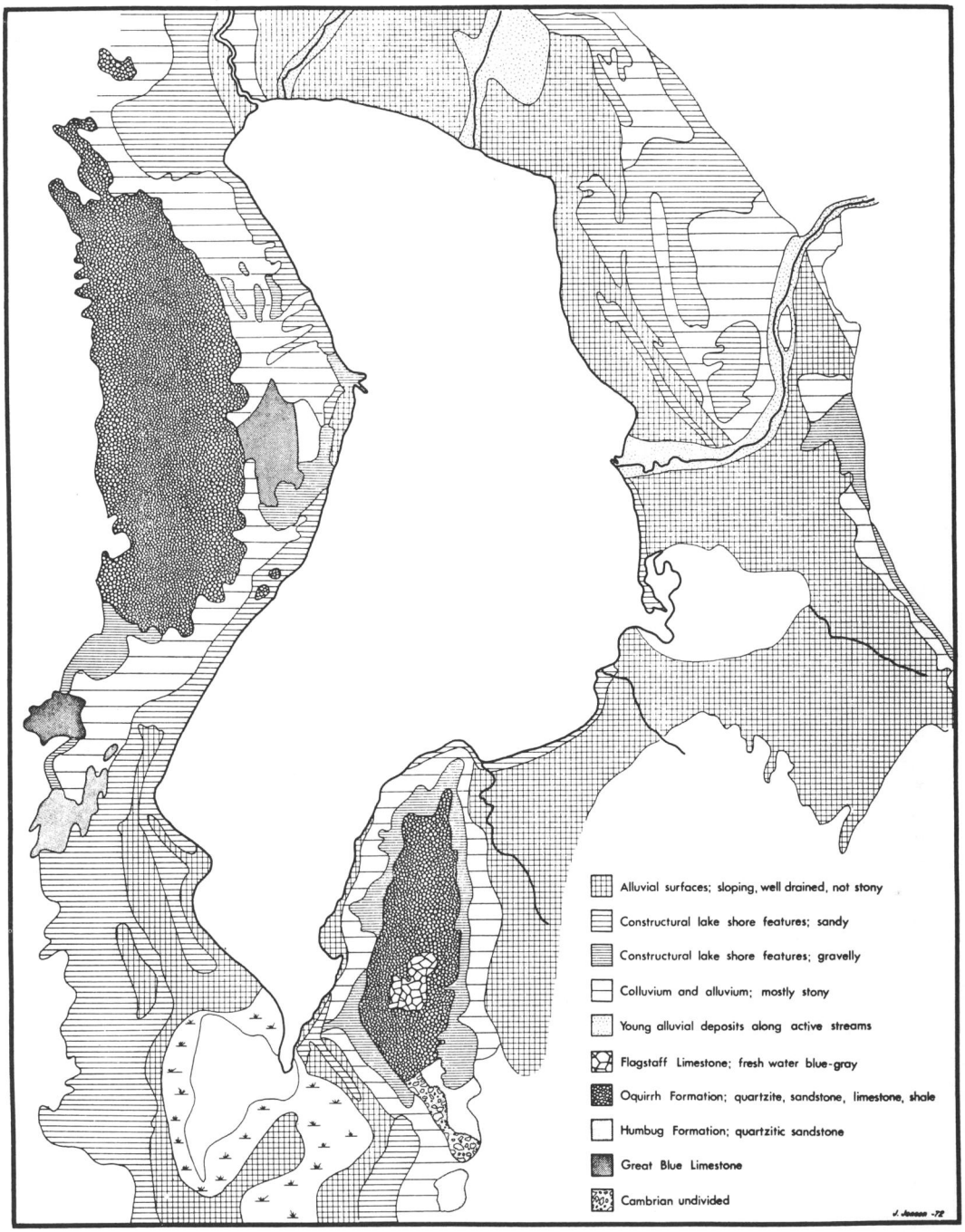

Fig. 3. Surface geology in the vicinity of Utah Lake.

Evaporation from Utah Lake, although considerable, seems to have no appreciable effect on local precipitation, although it does have some influence on humidity and temperature over and near the lake margins. Table 1 gives some monthly data on six stations that border Utah Lake (Utah Climatological Data, 1950–1975).

Temperature

Variation is perhaps the key word in describing temperature from place to place and from one season to the next in the valley. The transition from summer to winter and from winter to summer is usually quite rapid. There are distinct times of the year when springlike and autumnlike weather occur, but these "seasons" are best described in weeks of time rather than months. Average maximum July temperature is about 33 C (92 F), and the average minimum for the same month is 12 C (53 I). In the coldest month, January, the average maximum temperature is about 3 C (37 F), and the average minimum is approximately −10 C (14 F). Temperatures of over 38 C (100 F) are likely to occur during a few days of summer and drop to less than −26 C (−15 F) during a few days of the winter months (Table 1).

The geographical variation of temperature is seen in the growing season for three areas within Utah Valley. At Provo the growing season is 126 days; at Utah Lake-Lehi it is 132 days; and at Spanish Fork it is 167 days (Ashcroft 1963:28–33). Mountain and valley breezes and air inversion layers give partial explanation to these values, but location within the valley, proximity to the lake, altitude, etc., all help explain the differences. The charts below (Fig. 4) show probable dates of critical temperatures during the spring and fall for Lehi at the north end of Utah Lake and at the Provo Airport near the eastern shore.

Climate

Much of the early legend about the climate of central Utah and contemporary concepts nonresidents and residents alike have today about it is that Utah Valley is a desert (but may have been changed by man) or that it is part of a large desert that extends westward to the Sierra Nevadas. By all standards of measurement, however, Utah Valley is not a true desert. In fact, the eastern part of the valley is considered to have a humid climate.

A more apt description of the greater part of the valley is a cool winter steppe or semiarid climate. The boundary between this and the humid continental climate near the base of the Wasatch Mountains is determined by a comparison of total precipitation, including seasonal variation and potential evapotranspiration. Where the former is greater than the latter, a humid climate exists and vice versa.

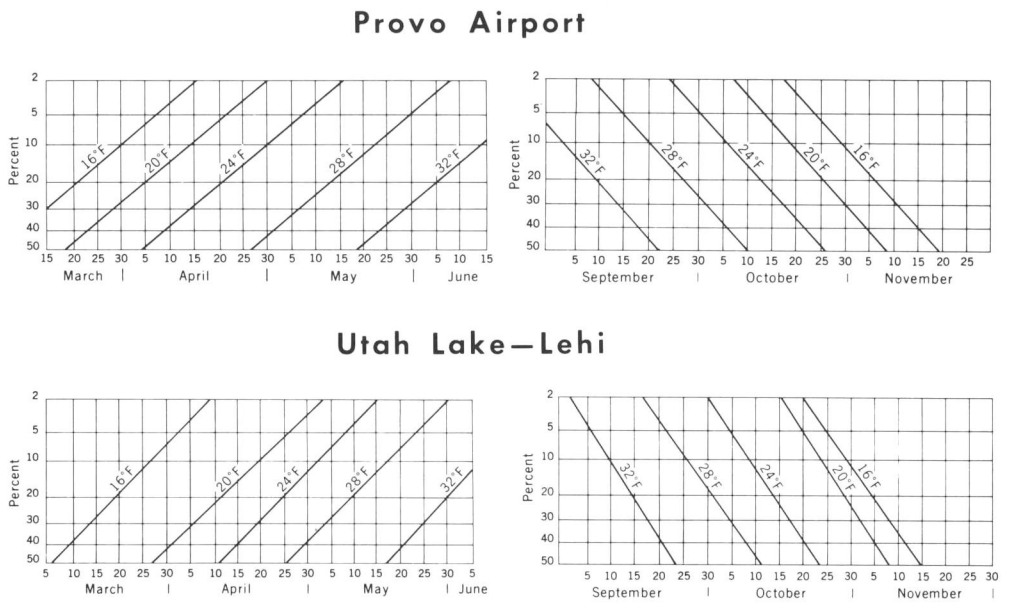

Fig. 4. Probabilities of first and last freezing dates at Provo Airport and Utah Lake-Lehi.

Table 1. Climatic Summaries for the Utah Lake Region.

Total Precipitation/Mean Snowfall

	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
American Fork	1.74	14.4	1.54	8.6	1.74	8.4	1.81	2.4	1.68	T	.92	.0	.86	.0	1.08	.0	.96	.0	1.50	.4	1.31	4.0	1.65	12.4	16.83	50.8
Elberta	.82	12.2	.92	8.0	1.07	9.7	1.02	2.3	1.14	1.4	.63	.0	.76	.0	.77	.0	.62	T	1.06	.7	.78	6.4	.83	.0.0	10.42	50.0
Fairfield	.72	10.0	.70	5.2	.94	6.4	.87	.5	1.27	T	.96	.0	.72	.0	.96	.0	.58	T	1.37	.4	.78	4.6	1.36	8.8	11.23	35.9
Lehi	.77	9.8	.94	6.3	.98	4.0	1.03	1.2	1.02	.1	.68	.0	.82	.0	1.02	.0	.68	.0	.98	.3	.82	2.8	.88	8.8	10.61	33.3
Provo Airport	1.49	18.9	.70	5.1	1.33	6.5	1.16	.1	1.45	T	.79	.0	.50	.0	1.12	.0	.31	.0	1.70	.7	1.29	4.2	1.75	14.5	13.59	50.0
Spanish Fork	1.79	15.6	1.52	9.9	2.00	9.4	1.96	2.9	1.62	T	.94	.0	.82	.0	.92	.0	.92	T	1.70	.4	1.61	5.5	1.86	13.9	17.66	57.8

Mean Maximum/Mean Minimum Temperatures

	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
American Fork	37.0	19.9	43.2	24.7	51.2	30.3	61.8	38.4	71.4	46.6	81.2	54.2	89.7	62.5	87.8	61.4	78.8	53.0	65.4	42.6	49.4	30.7	39.0	23.2	63.0	40.6
Elberta	37.1	15.3	43.4	21.1	53.2	27.0	64.2	34.3	73.8	41.4	84.3	49.0	92.1	57.2	90.2	56.0	81.1	45.6	67.2	35.0	51.0	24.7	39.9	18.1	64.8	35.4
Fairfield	32.9	5.6	40.5	15.3	49.0	24.0	62.0	31.5	70.3	37.5	77.9	43.2	90.6	52.7	88.8	52.6	80.3	42.1	65.0	33.0	47.8	22.9	38.1	14.5	61.9	31.2
Lehi	35.4	12.5	42.1	22.0	50.0	27.5	61.7	34.4	71.5	41.8	80.4	47.4	89.0	55.6	86.2	53.9	77.0	43.7	64.2	34.1	48.5	24.8	37.4	17.4	62.0	34.6
Provo Airport	34.1	13.1	42.5	19.4	49.7	28.5	63.4	38.3	71.6	44.8	80.0	49.4	89.5	57.0	88.5	50.9	80.8	46.9	66.4	37.5	48.3	27.6	39.0	21.5	62.8	36.7
Spanish Fork	37.8	18.5	44.0	23.3	53.4	29.5	64.8	37.2	74.3	44.2	85.0	51.6	92.8	59.4	90.5	58.0	81.6	49.2	68.2	39.8	51.6	29.4	40.2	21.7	65.4	38.4

Recorded Maximum/Recorded Minimum Temperatures

	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
American Fork	64	-15	70	-15	77	5	85	15	94	29	108	32	108	40	102	40	100	31	87	19	72	0	70	-12	108	-15
Elberta	65	-26	72	-25	78	0	89	12	94	21	104	49	109	32	104	34	97	20	87	13	76	-6	70	-28	109	-28
Fairfield	55	-31	60	-21	77	2	88	13	91	16	96	25	104	33	99	32	98	25	85	16	70	3	59	-21	104	-31
Lehi	57	-26	63	-28	77	1	84	14	90	21	102	30	106	38	100	33	94	18	85	10	72	-3	63	-25	106	-28
Provo Airport	57	-25	67	-20	74	9	87	24	92	28	93	35	99	42	99	42	98	28	88	22	75	5	61	-15	99	-25
Spanish Fork	63	-16	68	-17	80	1	87	10	93	20	104	31	108	38	104	39	98	29	87	11	79	-1	65	-19	108	-19

Mean Temperatures

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
American Fork	28.5	34.2	40.8	50.2	59.0	67.6	76.1	74.6	65.9	54.0	40.1	31.3	51.8
Elberta	26.2	32.2	40.1	49.2	57.6	66.7	74.6	73.0	63.4	51.2	38.0	29.0	50.2
Fairfield	19.3	27.9	36.5	46.8	53.9	60.5	71.6	70.7	61.2	49.0	35.4	26.3	46.6
Lehi	23.9	32.0	38.7	48.1	56.6	63.8	72.3	70.1	60.4	49.2	36.6	27.4	48.2
Provo Airport	23.6	30.9	39.1	50.9	58.2	64.7	73.2	72.2	63.9	52.0	37.9	30.3	49.7
Spanish Fork	28.2	33.6	41.4	51.0	59.2	68.3	76.2	74.2	65.4	54.0	40.6	31.0	52.0

Other Natural Features

Besides climate and land surface forms, soils and biota should be included in any discussion of the local physical geography. Because man has used and altered the more desirable areas of Utah Valley for crop production, towns, etc., the natural soil and biotic systems have been disturbed considerably since the early settlement period. The first settlers found most of the valley covered with grasses except where streams provided enough extra water for trees and other riparian vegetation. The hill slopes were probably not too different from what one sees today except there was less sagebrush and probably more grass on the lower slopes. In their quest to establish a permanent home here, the settlers tilled the land, spread the mountain streams over the soil to irrigate their land, grazed the hill slopes, and effectively changed the natural balance of plants and animals. They both inadvertantly and purposely introduced many varieties of plants and animals that formerly did not exist here.

The most recent soil survey of Utah County lists six soil orders in the study area. The most dominant are the Mollisols, which have a thick, dark-colored surface layer that is 1 percent or more organic matter and a base saturation of 50 percent or more (Swenson et al. 1972:134). Most of the good farm land is of this type. Other orders that are found here are Alfisols, which are poorly drained soils with saline or alkaline conditions; the Histosols, which are bog soils found near the lake shore and other marshy areas; and Aridisols, which are found in the drier places. Aridisols have a strong lime horizon within 100 cm (40 in) of the surface, and Inceptisols and Entisols are soils that have only recently begun to develop because of recent deposition of alluvium (Swenson et al. 1972:134–136, 164).

The irrigated farm land of Utah Valley produces alfalfa, grain, and corn silage as main crops. Much of the bench land is planted to fruit trees, especially cherries, peaches, apples, and pears. Home gardens are quite common, and many varieties of vegetables and fruits are grown in these noncommercial ventures.

Most of the natural vegetation has been replaced by cultivated crops, imported weeds, and landscaped yards with their wide varieties of plants. In spite of the abovementioned changes, Utah Valley is an impressive place to view after having traveled through surrounding areas. The Spanish fathers named it Paradise Valley in 1776. The current residents may not call it by such an exotic name, but it does have many amenities that make it stand out like an oasis in a desert.

HUMAN USE

Utah Lake and its associated streams and lake plains have been of importance to man for at least several millenia. The earliest known inhabitants of the lake plain area were the so-called desert culture of the American Indian peoples (Jennings 1960a:4). The desert culture people occupied the Great Basin and the valleys at the foot of the Rocky Mountains in the period from approximately 10,000 BC to 300–500 AD (Jennings 1960a:4). Evidence of the desert culture has not been discovered in and around Utah lake, but remains of the desert culture group have been found at Danger Cave in western Utah dating from approximately 8,000 BC (Jennings 1960a:8). The desert culture people were limited in numbers and led a life devoted to a search for food in the Great Basin and the rivers and streams and lakes associated with it. Their use of Utah Lake was restricted to hunting for game on the plains of Utah Valley and to occasional catching of fish in the rivers during spawning season (Montillo 1968:39).

The basic culture in the Utah Lake area for which extensive archaeological evidence has been discovered is the Fremont culture (Wormington 1955). In the Utah Valley area, the Fremont culture consisted of small groups engaged in the production of corn, squash, and beans; hunting and gathering; and relatively intensive fishing by those residing adjacent to Utah Lake. The lakes and rivers entering it were important sources of fish for the Fremont culture, as evidenced by bones found in archaeological sites on and around the lake (Montillo 1968). These Indians caught fish in the streams primarily during the spawning season. Numerous sites

of the Fremont culture exist around the shores and river mouths of Utah Lake. At least 36 sites have been located on the Provo River in the area west of present-day Provo (Montillo 1968:6). Other sites have been found on the lower Spanish Fork River, Goshen Bay, the Peteetneet River near Payson, the American Fork River, and the Jordan River, as well as at sites along the lake shore (Jennings 1960b:212).

The Fremont culture occupied the area around Utah Lake from 800 to 1600 AD (Montillo 1968:34), until the great drought of 1400 led to difficulty in subsistence, and the Fremont culture groups ultimately moved to the central plains of the United States (Montillo 1968:35). Following the migration of the Fremont culture, other Indian groups moved into the area.

At the time of occupation of the area by Anglos in the mid-1800s, three groups of Indians utilized the area around the lake. These represented the Paiute groups from the western side of Utah Lake and the Great Basin, the Ute Indian tribes periodically occupying the Utah Lake plains and the Provo, Spanish Fork, and American Fork river areas on the eastern shores as they migrated; and the Shoshone Indians, whose center was north in the Cache Valley, but who occasionally came into the area. These groups were nomadic and utilized the lake and rivers entering it for hunting and fishing.

The first written records relating to Utah Lake and adjacent lake plains come from the records kept of the Dominguez and Vélez de Escalante expedition. Dominguez and Vélez de Escalante left New Mexico in late July 1776 in search of a direct route to Monterey, California. In the course of their travels they came down Spanish Fork Canyon and into Utah Valley, entering the valley on 23 September 1776 (Jensen 1924:17–20). Dominguez and Vélez de Escalante provided a description of the Indian residents of the lake at the time of their arrival and indicated the importance of fishing to the Indian people. Because of the reliance of the people on fish, Timpanogotes, as Domingues and Véles de Escalante referred to them, were called fish eaters by other Indian groups (Jensen 1924:32). The Indians (the Timpanogotes) were said to have customs that resembled the western Shoshone and southern Paiute tribe (Steward, p. 40). Other authors maintain that the tribes found near the lake consisted of the Shoshone language group but were actually made up of Paiute, Goshiute, and Ute divisions. The Goshiutes were located in the area west and north of the lake, the Paiutes to the south and west of the lake, and the Ute tribes near the eastern side of the lake representing the Timpanogotes Indian tribe proper (Jennings 1960a:21). The importance of fish in the Indian life-style is brought out by the reference by other Indians to them as fish eaters and by the fact that, before leaving Utah Valley, Dominguez's party purchased a large quantity of dried fish for supplies on their return journey (Jensen 1924:23). Although it is impossible to reconstruct the use of the lake and rivers by the native population, it is evident that the lake played a central role in the life of the people who resided near it prior to its occupancy by Anglos.

Anglo Accounts of the Lake and Environs

Dominguez and Vélez de Escalante's exploration and associated journal represents the earliest available recorded description of Utah Lake and its environs. Judging from their descriptions of the area, the Dominguez party was much more interested in the land around the lake than the lake proper. Since the Spaniards were interested in creating agricultural settlements, the fertile, well-watered lake plains received the bulk of their attention. Dominguez described the lake and the area around it as follows:

> On the northern side of the San Buenaventura River, as we said before, there is a ridge of mountains, and from what we could see of it, it runs from northeast to southwest more than seventy leagues. In its widest part it is more than forty leagues, and where we crossed it, perhaps thirty. In this ridge, on the western side, at 40°49′ latitude, northwest, a quarter north of the town of Santa Fe, is situated the Valley de Nuestra Senora de la Merced de los Timpanoautzis, surrounded by the highest peaks of the ridge from which four medium-sized rivers descend which irrigate the valley, flowing until they enter the lake which is in the center. The plain of the valley from southeast to northwest extends about sixteen Spanish leagues [one Spanish league equals 2.63 miles] and from northeast to southwest ten or twelve leagues. It is all clear land except for the marshes by the side of the lake where the soil is good for every kind of planting.
>
> Of the four rivers which irrigate the valley, the first one on the southern side is the Aguas Calientes River [Spanish Fork] in whose extensive valleys there is

ground enough, easily irrigated, for two large towns. The second river, going north, three leagues from the first one, is more abundant and can support a large town or two smaller ones, there being much good soil, easily irrigated. This river, before emptying into the lake, is divided into two branches. On its banks, in addition to the poplars, there are tall alder-trees. We named it the San Nicolas River [apparently Spring Creek and Hobble Creek]. Three leagues and a half northwest is the third river, of flat valleys with good soil for planting. It is more abundant than the two above mentioned; it has large poplar groves and valleys of good soil with sufficient water to support two or even three large towns.

We spent September 24 and 25 by its bank and named it the San Antonio de Padua River [Provo River]. We did not reach the fourth river, though we could see its poplar groves. It is situated northwest of the San Antonio River, and it has on this side much flat and seemingly good soil. They told us it has as much water as the others, and therefore, several settlements or villages could be established by it. We named it the Santa Ana River [American Fork River]. In addition to these rivers there are in the plain many springs of good water and several springs which issue from the mountains.

Throughout the valley there is much good pasture and in some places flax and hemp grow in such abundance that it seems as though they had been planted deliberately. The climate is also good here because after suffering from the cold from the time we left the San Buenaventura River, now, night and day, throughout the valley, we feel very warm. Besides these excellent natural features, the surrounding mountains contain sufficient timber and firewood, many shelters, springs and pasture lands to raise cattle and horses. All this is true of the north, northeast, east, and southeast parts. On the south and southwest there are two other extensive valleys, also with abundant pasture and sufficient water. The lake extends to one of these valleys. It may be about six leagues wide and fifteen long and runs northwest. By means of a narrow opening, according to what they told us, it unites with others very much larger. The Timpanogotzis Lake is teeming with several kinds of edible fish, in addition to geese, beaver, and other land and water animals, which we did not see.

. . . With three fortresses and three towns inhabited by Spaniards in communication with the forts, the door will be opened to a new empire which can be explored and populated.

The base where the principal objective of the enterprise should be established is the valley and the borders of the Lake of the Timpanogos near one of the rivers which water the valley, because this place is the most pleasant, beautiful, and fertile in all of New Spain. It is large enough in itself to support a city with as large a poulation as that of Mexico City and its inhabitants can enjoy many conveniences because it contains every necessary thing for the sustenance of human life. The lake and the rivers which empty into the lake abound in many kinds of choice fish; there are to be seen there very large white geese, many varieties of duck, and other kinds of beautiful birds never seen elsewhere; beavers, otters, seals, and other animals which seem to be ermines by the softness and the whiteness of their fur. In the valleys of these rivers there is much uncultivated hemp and flax (Auerbach 1943).

The description of Utah Lake by the Spanish does not indicate whether the lake is clear or muddy or any of its other physical characteristics. Compared to the New Mexico area from which they had traveled, the lake and its adjacent fertile plains with the numerous streams entering it must have indeed presented a highly favorable spot. The fact that the water entering the lake and the lake itself were fresh, and that it provided an abundance of fish, met the purposes of the Spanish. The land on the lake plains would be the center of any settlements they established and, therefore, descriptions of the lake were secondary. It should be noted, however, that Dominguez did indicate that settlers should include carpenters who could build boats for use in navigating the lake and further exploring it to discover its utility (Auerbach 1943). The Spanish under the direction of Dominguez and Vélez de Escalante never returned to Utah Valley, and further information concerning the lake and its environs was not written until fur trappers visited the area in the early 1800s.

Recorded evidence seems to indicate that either William H. Ashley of the Rocky Mountain Fur Company or Jedediah Smith were the first early fur trappers to visit the lake. William Ashley is reputed to have visited the lake in 1825 (Bancroft 1889:21), but some scholars question whether he actually reached the Utah Valley area or whether the lake he visited was actually the Great Salt Lake (Dale 1918:155,168). Because of Ashley's purported visit to Utah Lake, the name Ashley Lake has occasionally been used in referring to the lake (Dale 1918:187). If Ashley did in fact visit Utah Lake, he left no written account of it. At least one other fur trapper, Etienne Provost, visited Utah Lake in the period of 1824, and from him the Provo River and Provo City take their names (Jensen 1924:28–29). Daniel T. Potts, a trapper with Ashley's Rocky Mountain Fur Company from 1822 to 1827, recorded of Utah Valley, "This is a most beautiful country. It is intersected by a number of transparent streams. The grass is at this time from six to twelve inches in height and in full bloom" (Frost 1960:62). Other trappers who visited the Utah Lake area left no written accounts on which to base an understanding of the lake and its characteristics.

John C. Fremont, a government explorer, visited Utah Valley in 1843 as his party returned from California. In addition, Fremont visited Utah Lake in another party in 1845. Fremont described the Utah Valley area as follows:

> In this cove of the mountains along its [Utah Lake] eastern shore, the lake is bordered by a plain where the soil is generally good, and in greater parts fertile; watered by a delta of prettily timbered streams. This would be an excellent locality for stock farms; it is generally covered with good bunch grass and would abundantly produce the ordinary grain (Fremont 1845:258).

Fremont's account represents the last of the intermittent Anglo visitors to Utah Lake. Shortly after his visit, the Mormon pioneers entered the Salt Lake Valley and began permanent colonization.

Mormon Settlement and Use in the Utah Lake Plain Area

The Mormon settlement of the Great Basin in 1847 represented the first permanent white occupation of the region around Utah Lake. The leader of the Mormon pioneers, Brigham Young, received his first report of Utah Lake while en route to the Salt Lake Valley in 1845 during an encounter with Jim Bridger. Brigham Young hoped that Utah Lake would provide sufficient fish to augment the settlers' cattle (Wride 1961). After the arrival of the Mormons in the Salt Lake Valley and initial settlement of that area, an exploring party was sent to the Utah Lake area in December 1847. Under the direction of Parley P. Pratt, this small exploring group brought a wagon and boat into Utah Valley and attempted to fish on Utah Lake, then explored the surrounding area. Pratt notes that, after traveling into Utah Valley, they arrived at

> . . . the foot of Utah Lake, a beautiful sheet of fresh water, some 36 miles long by 15 broad. Here we launched our boat and tried the net, probably the first boat and net ever used on this sheet of water in modern times. We sailed up and down the lake shore on its western side, but had only poor success in fishing. We, however, caught a few samples of mountain trout and other fish. After exploring the lake and the valley for a day or two, the company returned home, and a Brother Summers and myself struck westward from the foot of the lake on horseback on an exploring tour (Jensen 1924:31).

As a result of Pratt's favorable report of Utah Valley and continued population growth in the Salt Lake Valley, the Mormon leadership began plans for settling Utah Valley in late 1848. In March 1849 a group under the direction of John S. Higbee, who had previously visited the Utah Lake area with Parley P. Pratt, came into Utah Valley and settled on the Provo River slightly west of present-day Provo City. The fort which they constructed represents the first Anglo settlement on the shores of Utah Lake. Associated with this settlement was the cultivation of common agricultural crops, with related diversion of water from the Provo River (Jensen 1924:33–38).

During the same year additional communities were founded around the lake on Battle Creek (Pleasant Grove) and Lakeview. The following year an additional six communities were founded—American Fork, Lehi, Payson, Spanish Fork, Spring Lake, and Springville (Table 2). It should be noted that by 1851 there were settlements along all the streams entering Utah Lake, and by the 1860s essentially all the communities in the area had been founded.

Population growth in the region was based on agriculture and did not increase rapidly until after the 1940s. Little is known of the views of Utah Lake by the early settlers other than their statement that it was a freshwater lake. Since the initial colonists and explorers were coming from the Salt Lake Valley, this was the most important factor when compared to the saline Great Salt Lake. Since the freshwater streams provided culinary water, the settlers were never seriously concerned about the relative quality of the water within the lake proper. Likely the lake itself was approximately the same as at the present in terms of amount of sediment suspended in the water and associated turbidity (Brimhall and Merritt 1976). A report in the early 1900s indicated that the water was cloudy and opaque three to six inches below the surface, which is similar to its present condition (Huber 1972:57). Although the settlers recorded few impressions of the lake, Utah Lake and its associated streams were of paramount importance to them.

Mormon Use of Utah Lake and Associated Streams

Fishing from Utah Lake and adjoining streams was one of the primary uses of the lake by the Mormon settlers. On 6 January

TABLE 2. Settlement and population growth of communities around Utah Lake.

Settlement	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
Alpine, 1851 (Mountainville)	135	208	319	466	520	496	407	509	441	571	775	1047
American Fork, 1850 (Lake City, McArthurville)	695	1115	1299	1942	2732	2797	2763	3047	3333	5126	5373	7713
Benjamin, 1860			150	417	661	580	575	619	674	706		
Elberta, 1895 (Mount Nebo)					153		300	278	151	138		
Genola, 1935							194	321	325	314	380	424
Goshen, 1857 (Sodom, Sandtown, Mechanicsville)			394	298	645	470	526	669	616	525	426	459
Highland					195	171	247	277	270			
Lakeshore				390	582	528	457	482	528	523		
Lakeview, 1849				376	276	344	391	400	460	446		
Lehi, 1850	831	1058	1490	1907	2719	2964	3078	2826	2733	3627	4377	4659
Linden, 1925								589	587	801	1150	1644
Mapleton					584	534	586	663	907	1175	1516	1980
Orem, 1920								1915	2914	8351	18394	25729
Palmyra									262	236		
Payson, 1850	830	1436	1788	2135	2636	2397	3031	3045	3591	3998	4237	4501
Pleasant Grove, 1849 (Battle Creek)	526	930	1775	1926	2460	1618	1682	1754	1941	3195	4772	5327
Provo, 1849 (Fort Utah)	2030	2384	3432	5159	6185	8925	10303	14766	18071	28937	36047	53131
Salem, 1856 (Pondtown)	180	353	510	527	894	693	609	610	659	781	920	1081
Santaquin, 1851 (Summit Creek)	158	602	715	769	889	915	976	1115	1297	1214	1183	1236
Spanish Fork, 1850	1015	1450	2304	2214	2735	3464	4036	3727	4167	5230	6472	7284
Spring Lake, 1850			157	93	232	188	252	300	453	495		
Springville, 1850 (Hobble Creek)	1357	1661	2312	2849	3422	3356	3010	3748	4796	6475	7913	8790
Vineyard					398	435	560	543	719	267		

1849 a party of six men was sent to fish Utah Lake by Brigham Young, but they were unsuccessful in obtaining quantities sufficient to justify continued fishing efforts (Crawley and Knecht 1964:29). After settlement of Provo in 1849, fishing became an important part of the subsistence economy practiced by the settlers. Spawning fish in the lower Provo River

and adjacent areas of Utah Lake were caught and utilized fresh, dried, or salted in barrels for later use (Huntington 1960). With the passage of time, increased fishing took place on the streams entering Utah Lake (Gardner 1913).

Since it was the custom of the Indians in the area to fish the streams during the spawning season of the lake fish, they found the presence of the Mormon settlers and their extensive fish catch an unwelcome competition as early as 1853 (Armstrong 1855:203–209). In the spring of 1855, when the Indians arrived, the Indian agent noted that "the Utah Lake and Provo River at this season of the year abound in fish known as mountain trout, and it is for the purpose of fishing that so large a number of Utah tribes of Indians resort hither every spring." According to the Indian agent, the Indians attempted to take fish through trapping, using of bows and arrows, and catching them with their hands in the riffles, but were unable to do so because of the competition from Mormon settlers who were using nets and seines to catch fish. As a result of the high water and the settlers' efforts, the Indians felt they could not obtain sufficient fish for drying, and the Indian agent arranged for the settlers to catch fish for the Indians' use. "At the insistence of some of the chiefs, I requested one of the fishing companies to fish for them, which request the company immediately complied with, and after some days successful fishing, they loaded the packhorses of the Indians with large quantities of fish." (Commissioner of Indian Affairs 1855:202–203).

By 1856 one group of settlers had begun a commercial fisheries establishment that caught fish for use in the Utah Valley and Salt Lake area throughout the year (Carter 1975:8). The lake continued to be an intensive source of fish for the settlers of Utah Valley in the period from 1856 to 1860 as regulations were promulgated by Provo City and other communities to regulate the fisheries of both the lake and streams entering into it. An ordinance for control of fishing privileges passed at the Provo City Council meeting on 6 August 1853 is the earliest recorded evidence of control of the fishing (Jensen 1924:83–84).

By the late 1860s and early 1870s, however, the number of commercial fishing groups declined and fishing activity began to decrease as a result of diverting water from the streams for irrigation and the associated loss of fish population. The fishing continued on Utah Lake and adjacent streams through time, as indicated in Table 3's brief outline of the fisheries of Utah Lake to 1904 (Carter 1975:8–16). Fishing and fishing activities on Utah Lake were as significant to the Mormon settlers of the valley as they had been to the American Indians previous to the Mormon settlement.

The single most important use of Utah Lake and the streams associated with it was for water for irrigation purposes (Fig. 1). As each community was established, primitive diversions were made to carry irrigation water to adjacent fields. Two canals were developed in Provo city in 1850 for irrigation of fields in the area of present downtown Provo. The first was the Turner ditch, which watered approximately half a square mile, and second was the East Union ditch, which carried water to the foothills east of the present downtown area (Jensen 1924:63). As time passed, these systems were expanded and water was diverted higher up the stream to bring additional land under the ditch for irrigating. By 1874 all the summer low flows in the streams had been appropriated and disputes began as to who actually controlled the rights to the waters that had been claimed or utilized.

Some idea of the extent and rapidity of water diversion is evident from the fact that by 1869 one-third of the ditches and laterals found in Utah Valley in 1920 had been completed (U.S. Bureau of Census 1920). Also by 1869 there were five major canals taking water from the Provo River. In addition, the so-called Highline Canal was under construction; it followed the base of the mountains from Provo Canyon to the bench areas along the eastern bank of Provo River. At the same time American Fork River had four major canals taken from it, one to American Fork, one to Lehi, one to Pleasant Grove, and one to the area north of these communities. Dry Creek had canals taking water to the Lehi area and to the vicinity of present-day Alpine; Hobble Creek had three canals divert-

TABLE 3. Brief annotated history of the fisheries of Utah Lake, 1849–1900

Date	Activity
1849	Beginning of commercial fishery in Provo River and Utah Lake.
1850–52	Spawning fish in rivers and streams still caught.
1856	Rapid increase in commercial fishing with year-round harvest, long seines introduced. Selling of fish common in Utah Valley and Salt Lake Valley. State, county, and local governments begin some regulation of fishing. Provo City regulated the Provo River, while Utah County regulated fisheries of Utah lake and other streams (Spanish Fork, Jordan River, Payson Creek, and Provo Bay streams).
1860–70	Decline in the number of commercial fishing groups; consolidation of fishing areas.
1863	Jens Michelson begins long-term fishery, mouth of Spanish Fork River.
1870	The fishing decline was noticed and a special committee was appointed in 1870 at the general conference of the LDS Church to develop fish culture.
1872	Yarrow and Cope visited and felt the trout fishery had declined one-third. Several court cases on mesh size of seine and unlicensed fishermen.
1875	Continued decline in catch; still a ready market.
1876	Territorial legislature bans seining and poisons or explosives, and requires a fish passageway in all dams.
1878	First Utah County fish and game commissioner appointed.
1880	Entrances of all irrigation canals should be screened.
1882	Lawful to fish with seine 200 yards long by 12 feet wide, mesh 2 inches center and 1½ inches in wings.
1884	Mesh size reduced to 1½ inches for 50 feet center.
1886	Screen law for irrigation ditches repealed because cleaning screens a nuisance. Carp introduced into Utah Lake.
1888	Season established from 1 October to 1 June to legally seine or hook and line fish for trout.
1890	Territorial game warden appointed. Largemouth bass introduced into Utah Lake.
1890–94	Black bullheads, channel catfish introduced into Utah Lake.
1894	Most of trout shipped out of territory. Suit brought in Utah County court to halt practice.
1895	Largemouth bass become very common in Utah Lake.
1897	Only carp, clubs, mullets, and suckers can legally be taken by seine.
1897	Mills, factories, power plants, and manufacturing concerns required to install fish screens in intake canals.
1897	Unlawful to seine within one-half mile of inflowing river into Utah Lake.
1899–1904	Around 500,000 pounds of fish (mostly no trout) from Utah Lake shipped out of state.

ing water to the Springville and Mapleton areas; and Spanish Fork River had five canals diverting water to irrigate much of the area in the central and southern portions of Utah Valley. In addition, canals of undetermined number also diverted water from Santaquin and Peteetneet Creeks by 1869 (Griffin 1965:41–43). Later, larger dams were constructed farther upstream to divert water to higher areas around Utah Lake and/or to store water. Figure 5 indicates the major irrigation canals in the vicinity of Utah Lake at present.

Of the four larger rivers that flow into Utah Lake, Provo River brings more than one-half the total water flow into Utah Valley. The natural flow of the Provo River at its entrance to Utah Valley averages approximately 358 $\times$ $10^6 m^3$/yr (290,000 ac-ft/yr) (Hudson 1962:80). Man-made modifications to this flow include 14 small reservoirs on the headwaters of the Provo River, totaling 12.3 $\times$ $10^6 m^3$ (10,000 ac-ft) of storage constructed prior to 1910 and diversions from other drainage basins. The Weber-Provo Canal is the largest of the intrabasin transfers and brings water from the Weber River basin into

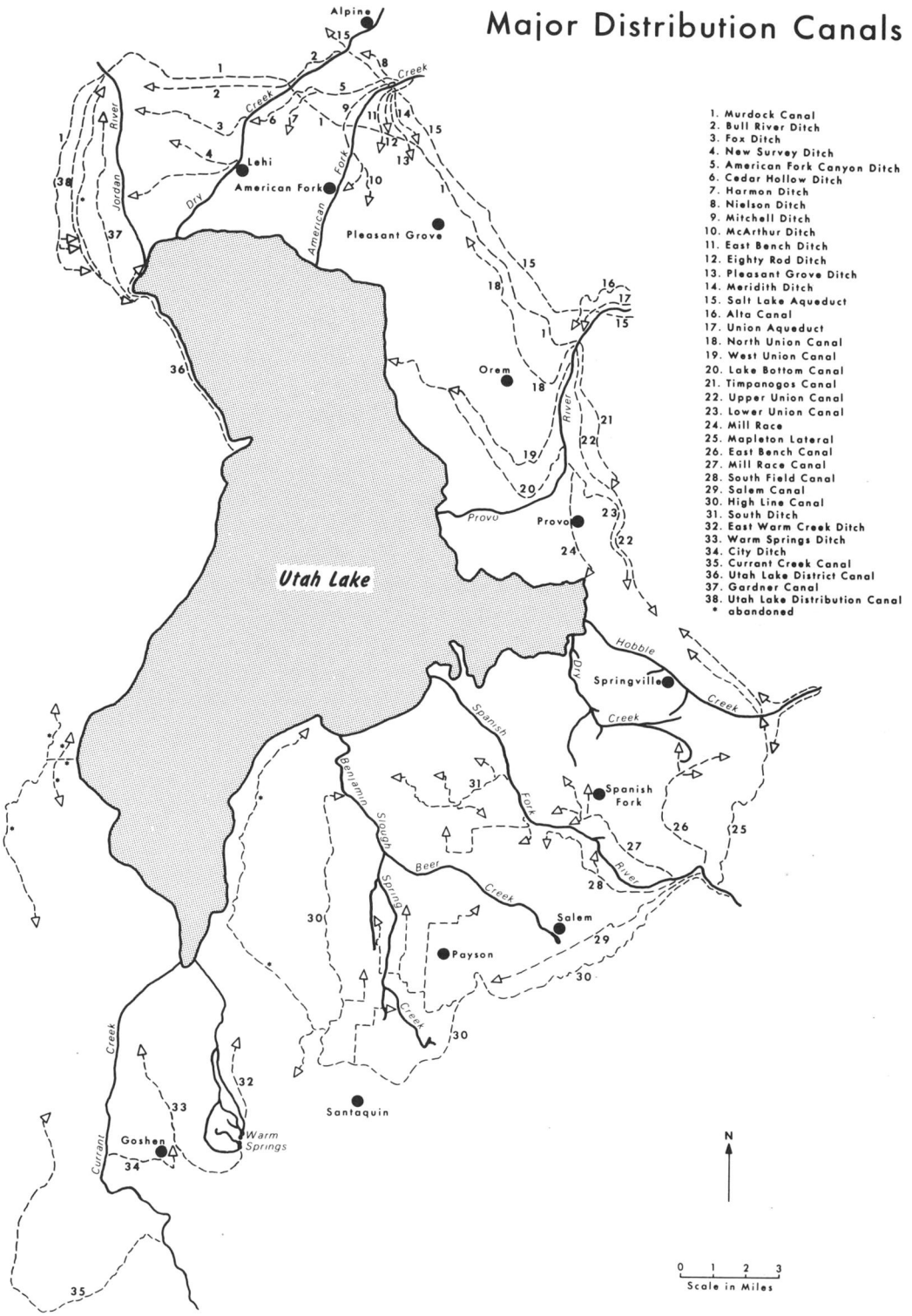

Fig. 5. Major distribution canals in the vicinity of Utah Lake.

the Provo River drainage basin. The canal was originally built in the 1920s and was later enlarged in 1947–1951 as part of the Deer Creek project. The annual amount delivered to the Provo River varies from 41×10^6 to over $93 \times 10^6 m^3$ (33,000 to over 75,000 ac-ft), depending on the amount of precipitation in a given year (Hudson 1962:82–83). In addition, water is transferred from the Utah Lake drainage basin to the Great Salt Lake drainage basin by means of the Salt Lake aqueduct, which takes between 26×10^6 and $33 \times 10^6 m^3$ (21,000 and 27,000 ac-ft) of water annually for use in Salt Lake Valley (Hudson 1962:84). The most recent modification of flow in the Provo River was associated with the Deer Creek Reservoir, begun in 1938 and completed in 1941. The reservoir has a usable capacity of $189 \times 10^6 m^3$ (153,000 ac-ft) (about one-half the average annual flow of the Provo River). The net seasonal effect on the Utah Lake area has been an increase of between 4.9×10^6 and $7.4 \times 10^6 m^3$ (40,000 and 60,000 ac-ft) annually during the summer season (Hudson 1962:84–85).

The Spanish Fork River basin occupies the southeastern portion of Utah Valley and averages about $123 \times 10^6 m^3/yr$ (100,000 ac-ft) of flow under natural conditions. Additional water is diverted from the Colorado drainage basin via the Strawberry Reservoir system completed in 1915. Water from Strawberry Reservoir is diverted into the Diamond Fork River, a tributary of the Spanish Fork River. The average amount of water diverted into the Spanish Fork drainage has been approximately $86 \times 10^6 m^3/yr$ (70,000 ac-ft/yr), particularly during the months of June, July, and August (Hudson 1962:90–x3). The Central Utah Project of the Water and Power Resource Service (formerly the Bureau of Reclamation) completed enlargement of the Strawberry Reservoir in 1975, and additional water will be diverted in the future from the Colorado River Basin to the Great Basin via the Spanish Fork River.

Irrigation reservoirs have also been constructed on the headwaters of the Peteetneet Creek-Payson system, American Fork River, and other tributary streams entering Utah Lake. These reservoirs are much smaller than either Deer Creek or Strawberry and are used to regulate the flow of the streams for irrigation purposes. Through diverting water for irrigation, some of the streams entering Utah Lake are completely dry in late summer.

Use of water from Utah Lake proper for irrigation purposes is much less than that used from the streams entering the lake in Utah Valley. Historically attempts were made to utilize water from the lake for irrigation through use of pumping stations constructed on the west side of the lake where no perennial streams exist. One of the earliest of these projects was associated with the settlement of Mosida, which was developed on the southwest shore of Utah Lake by people from the Denver area from 1909 to 1917. This project consisted of pumping water from the lake with three pumps for irrigating 3845 ha (9500 ac) of land on the southeast shore of Utah Lake (Brough 1974:2–5). This was very successful initially as land was planted to orchards and irrigated, but the lowering of the lake's water level as the wet cycle passed left the intakes of the pumps above water and the project was abandoned. There are several small irrigation companies presently taking water from a pumping plant on the northeast shore to irrigate a small quantity of land.

One of the major factors affecting Utah Lake water is the "compromise" level of the lake. Irrigation interests in Salt Lake Valley wanted to use Utah Lake for storage of water for release to Salt Lake Valley in the late summer, but farms around Utah Lake became flooded with increased lake level. The first plan to raise the level of Utah Lake was in 1864, when it was proposed that a dam be placed at the head of the Jordan River to raise the level of Utah Lake four feet. The Provo City council objected to this action and the dam was not built (Jensen 1924:253–254). However, in the spring of 1879 the farmers of Salt Lake County began to build the proposed dam. By 1881 it was noted that high water in Utah Lake resulting from the completed dam was causing "fearful damage" to farms around the lake. Some farmers felt the best plan was to blow up the dam, but it was finally determined that the question would be submitted for arbitration between the two groups. In 1884 an agreement was reached that regulated the extent to which Salt Lake irrigation companies

could increase the level of the water in Utah Lake. The 1884 decision called for a 6-foot-wide opening in the bottom of said dam not to exceed 6 inches above the base of the existing dam, which represented the low watermark for the lake. Obstructions or diversions placed in this opening could not exceed 3 feet 3½ inches. The level of the lake when it was raised 3 feet 3½ inches was referred to as the compromise level (Jensen 1924:256–257). The difficulty of enforcing this agreement and the differing interpretations of where the low watermark was with reference to the compromise level resulted in additional suits. In 1895 additional adjudication was undertaken, and a new compromise level was reached 2 inches below the former one. This compromise level of 4,488.9 feet above sea level (later determined to be 4,489.34 feet) has been the shoreline since. It should be noted, however, that the actual shoreline fluctuates considerably because the opening in the dam at the head of the Jordan River during some spring high-flow periods will not allow the water to flow out rapidly enough to prevent an increase above this level—with resultant flooding of farm lands (Figure 6 shows lake fluctuation from 1920 to 1977).

Utah Lake continues to be a storage area for Salt Lake Valley irrigation, and the streams flowing into it remain a primary source of irrigation water for the lands around the lake. As of 1979, recent expansion of the Strawberry Reservoir with future increased flow in the Spanish Fork River during the summer, and proposals for a new reservoir in the Provo River drainage basin above Heber (Jordanelle Reservoir) will further affect the flow of the Provo River. The Bonneville unit of the Central Utah Project, of which the foregoing changes are a part, includes diking of the Provo Bay and Goshen Bay to further change the configuration and area of the lake proper (Central Utah Project, Bonneville Unit 1972).

Other than for irrigation and fishing, the use of Utah Lake and its streams has been varied. Water from the rivers has been and is used for culinary purposes, including an average of 31 × $10^6 m^3/yr$ (25,000 ac-ft/yr) for use in Salt Lake City through the Salt Lake aqueduct, the use of springs in Provo Canyon for Provo City, and use of the headwater source areas of the Peteetneet and Summit Creek areas for their respective communities. These uses are minor when compared to the total volume of water involved in irrigation, however.

The lake has historically been useful for other purposes. There was barge traffic on

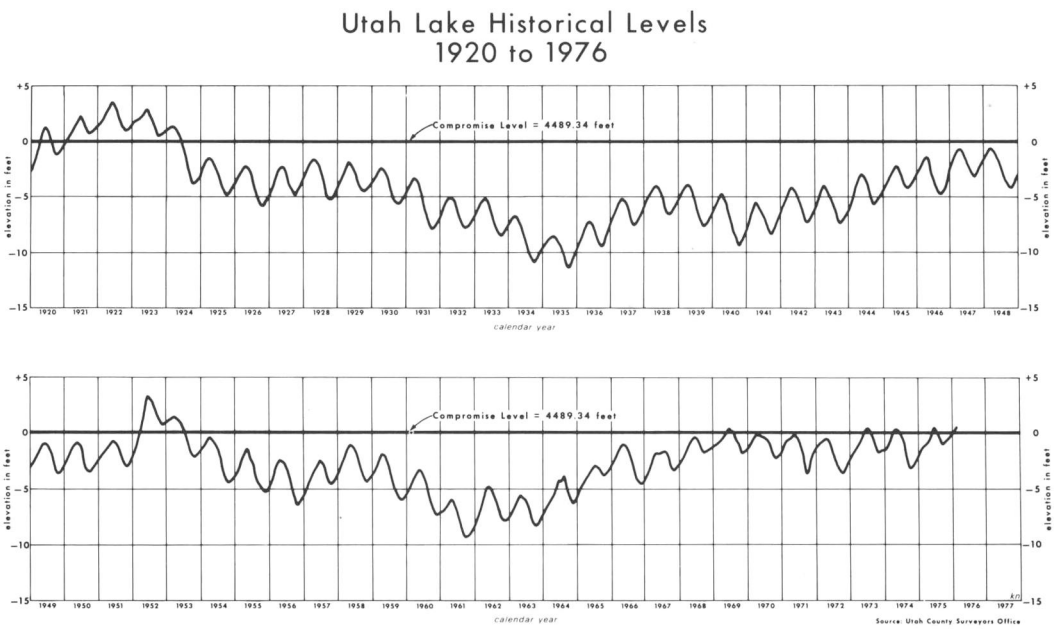

Fig. 6. Water levels in Utah Lake.

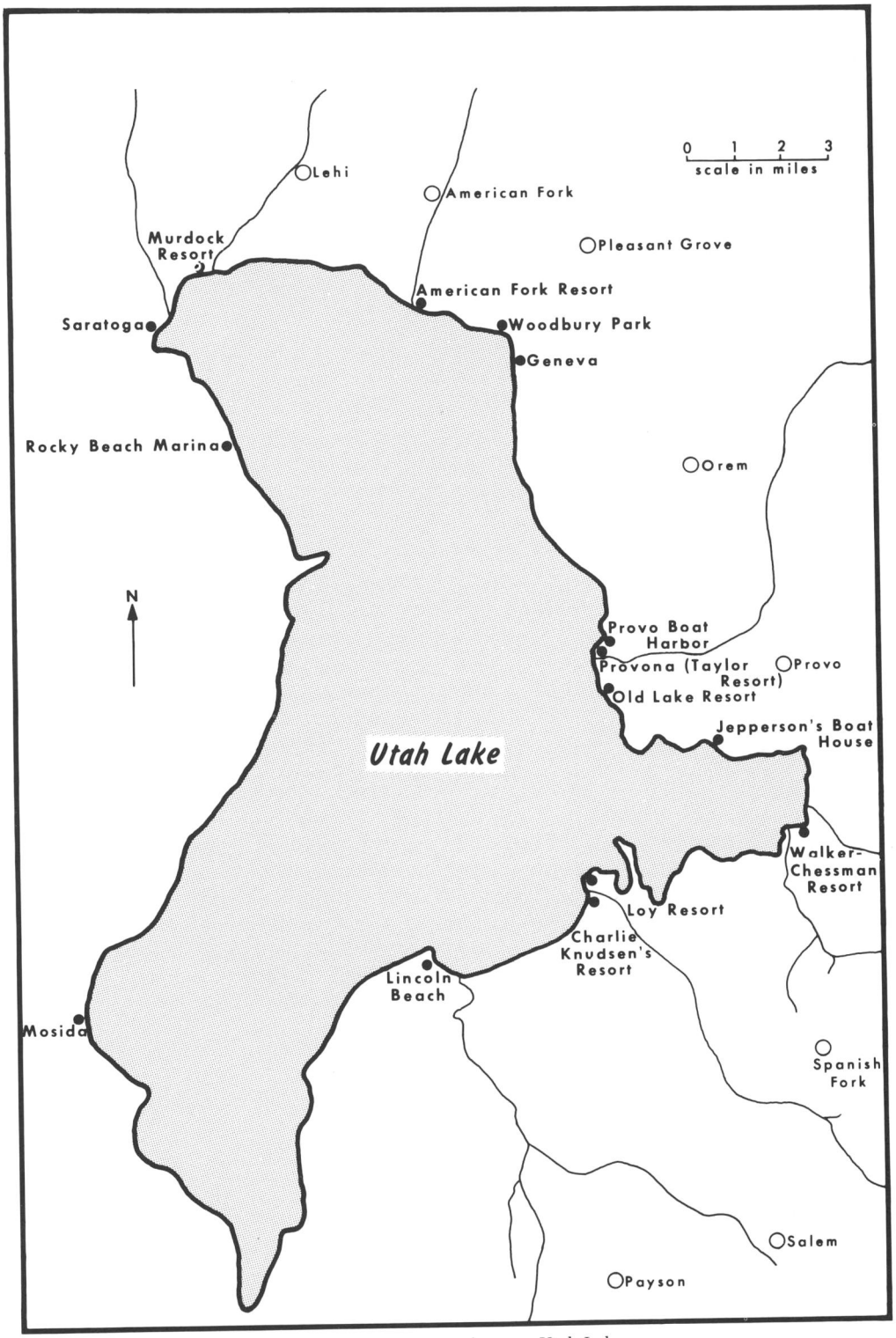

Fig. 7. Location of current and historical recreational facilities on Utah Lake.

TABLE 4. Resorts on Utah Lake from 1860 to the late 1930s

Saratoga	1860s to present	Baths, swimming pools, pavilions for dancing, picnicking
Walker-Chessman	1870s–early 1900s	Hotel, restaurant, boat rental
Woodbury Park	1880–1888	Summer cottage, bath houses, dance pavilion, boat dock
Old Lake Resort	1883–1907	Pavilion, boat house, ice house, restaurant, bath house, two piers
Geneva	1888–1935	Hotel, saloon, bath houses, pavilion, boat harbor
Lincoln Beach	1889–ca. 1900	Tourist house, swimming pool, store, saloon, dance pavilion
American Fork Resort	1892–1930s	Dance hall, pool hall, piers, picnic facilities, cafe, bath houses
Mindock Resort	1894–ca. 1900	Dance pavilion, picnic facilities, bath houses
Jepperson's Boat House	1890s–1920	Picnic facilities, piers, boat harbor, boat yard, refreshment stands
Knudsens' Resort	1913–ca. 1918	Boat rentals, fishing equipment rental, picnic facilities
Loy Resort	1913–1925	Boat rentals, picnic tables, bathing facilities
Provona (Taylor Resort)	1825–1930s	Store, dance hall, 30 cabins, bath houses, picnic facilities

Source: Glen R. Huber, "The Attitude of the People of Utah County Towards Utah Lake as a Recreational Site," Thesis, BYU, 1972, p. 27–35.

the lake between Provo and Mosida during the period of the town's existence from 1909–1917 (Brough 1974:8). Earlier proposals had suggested that towns on the south end of Utah Lake could be connected directly with Salt Lake City via a canal down the Jordan River and Utah Lake, but by 1863 these plans had been abandoned (Steele, p. 21). There were other schemes for using Utah Lake for transportation that were never implemented, except for one which would have connected the rich mining area of Tintic with Provo through use of a boat entitled the "Florence." Passengers and cargo were to be shuttled between the Tintic stage lines on the west side of the lake and the Denver and Rio Grande western railway at Provo. The boat made one trip in 1891 to meet the stagecoach but failed to make connections. The idea was abandoned before a successful commercial link could be completed. Other uses of the lake for boating were primarily of an excursion nature and consisted of boats for carrying people about the lake for sightseeing and dancing (Jensen 1924:267–268).

One of the major uses of Utah Lake has been for recreation. The Anglo settlers ranked recreation as the lake's third most important use. Figure 7 indicates the location of 15 resorts that have existed around the shore of the lake (Huber 1972:29). Table 4 provides information on the specific resorts that have been located around the lake. Subsequent to the time of the resorts the most important developments have been associated with the Provo boat harbor. The U.S. government assisted the city in its initial development in the early 1930s. It was maintained by Provo City and the Provo Boat Club until 1976, when it was turned over to the state. Since that time the boat harbor has been improved and now has facilities for camping, boating, and ice-skating. In addition, there are other private boat marinas around the lake, including the Rocky Beach Marina on the west side of the lake now utilized by a private boat club.

The potential for future development as a recreation and aesthetic resource is great. There is potential for enlarged sport as well as commercial fishing. The increasing population of the Utah Valley area means that it will continue to be a major recreational site. Proposals by the Department of the Interior for diking the lake will increase recreation opportunities, as well as provide additional irrigation water for the lands around the lake.

Utah Lake and its tributary streams were central to successful occupancy of the Utah

Valley region by white settlers as well as to earlier Indian occupants. For the foreseeable future, Utah Lake will continue to be of central importance to Utah Valley residents. An understanding of its fauna and flora, geology, setting, and use is essential in understanding its importance and maximizing its use.

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