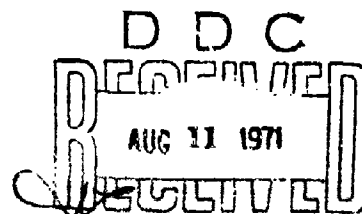


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SURVIVAL GEOGRAPHY OF IRAQ

ADTIC Publication D-105



Arctic, Desert, Tropic Information Center
Research Studies Institute
Air University

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Preface

This study is designed to provide airmen with the basic geographical data bearing on emergency survival in Iraq. The physical and cultural features of Iraq are described and evaluated in terms of favorable and unfavorable survival conditions and in terms of obstacles that would be of concern to downed crewmen forced to live on their own under emergency survival conditions.

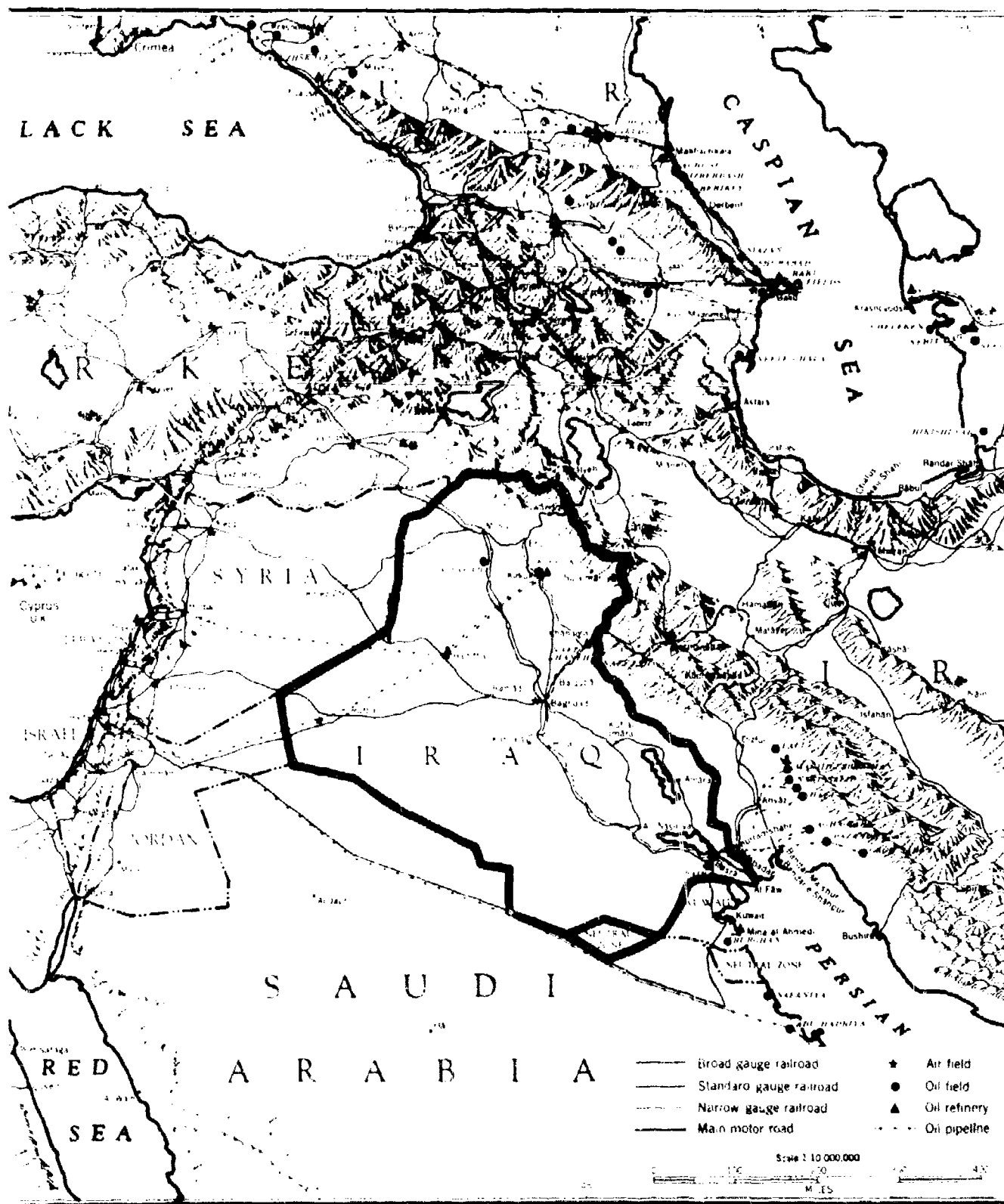
Coverage does not include basic survival techniques, such as first aid, fire-making, shelter construction, signaling, etc. It is assumed that the reader is knowledgeable of such matters either through courses in survival training or from reading Air Force Manuals 64-5 and 64-3.

PAUL H. NESBITT
Chief, ADTIC
Research Studies Institute

Best Available Copy

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IRAQ AND THE MIDDLE EAST

Survival Geography of Iraq

TERRAIN ANALYSIS

Iraq, a Middle East country, is located between coordinates 37° 23' - 29° 06' N., and 38° 46' - 48° 35' E. It is bordered on the north by Turkey, on the east by Iran, on the southeast by the Persian Gulf and Kuwait, on the south by Saudi Arabia, on the west by Jordan and on the northwest by Syria. Iraq has an area of approximately 172,000 square miles and is irregularly shaped with a maximum north-south distance of about 600 miles and a maximum east-west distance of about 500 miles.

General Topography:

Iraq is a country of varied relief. Within its boundaries may be found high mountains, foothills, plains, deserts, marshes and irrigated delta lands. Foot travel and living off the land varies from easy to difficult or impossible depending on the region and the season.

In Iraq, deserts and semideserts comprise over half the area of the country, including virtually all of the land south and west of the Euphrates River as well as most of the land between the Tigris and Euphrates north of Baghdad. This region is a vast flat tableland broken occasionally by deeply incised wadies which are especially prevalent in the Western Desert. The desert surface is mostly gravel though it may be sandy in limited areas.

The major water barrier crossing the desert is the upper Euphrates River which separates Al Jazira from the Western Desert. The steep cliffs along the sides of the narrow river valley are broken by gullies and wadies which occasionally afford access to the upper plateaus. In Al Jazira some salt marshes are found and parts of the Wadi Tharthar, the only perennial desert stream, may be unfordable in winter or after the spring rains. If topography is the only consideration the deserts of Iraq are relatively easy to traverse; much greater deterrents are the extreme heat and lack of water.

Northeastern Iraq is a region of plains, foothills and high mountain ranges. The undulating piedmont plain immediately to the east of the Tigris is divided into basins or separate plains by short low ridges running roughly northwest-southeast which present only local obstacles to cross-country movement. Greater impediments to travel are the larger streams when in spring flood. However, all but the Tigris can be forded in summer and many of them are dry during much of the year.

In the foothills to the northeast the relief is more rugged, and consists of mountain ridges up to 9,000 feet in height which separate the lower basin areas. In the extreme northeast the high Kurdish Mountains reach elevations up to 12,000 feet. Although travel is often difficult these ranges can be crossed on foot by the existing passes except during the winter when they may be periodically blocked by snow. The most difficult terrain is located along the streams and gorges. The streams in this mountainous area are perennial and often flow in narrow, steep sided valleys which constitute considerable obstacles to cross-country movement and are sometimes impassable. Streams are highest in May and June during the snow-melt period.

The delta region, or vast alluvial plain of the Tigris and Euphrates Rivers, extends from a point about 75 miles above Baghdad to the Persian Gulf and includes most of the land between the desert on the west and the Iranian border on the east. Much of the region is marshy and there are a number of large, intermittent lakes. Differences in relief are so slight, i.e. a few feet, that neither the marshes nor the shallow lakes (nowhere more than a few feet deep) have definite shape. Many local areas that do not receive water by natural means are irrigated by canals and ditches. During the spring floods this region presents an almost insuperable barrier to movement by land. At all times, however, the survivor will be hindered by marshes, lakes, canals, ditches, and irrigated fields. In Iraq floods start

in November and usually reach their peak in May when they gradually subside to minimum depths in September or October.

Mountains:

The mountains of Iraq are concentrated in the northern and northeastern parts of the country. The highest mountains and the most rugged country are located in a narrow belt about thirty-five miles wide immediately along the Turkish and Iranian borders. These mountains, part of the Kurdistan range, extend from southern Turkey to northwestern Iran. For the survivor this region must be considered the wildest and least accessible part of Iraq. The mountains are high and massive, several peaks exceed 10,000 feet in height. Qalate Garrade (36°32'N - 44°59'E) has elevation of about 12,000 feet.

Within the mountains, steep slopes are often dissected by streams in narrow, deeply incised, ravines which may become torrents during the melting of the snows. Localized floods, both in winter and in spring, retard movement by foot.

Plains:

Lying at the base of the mountains of northeastern Iraq is the Assyrian Plain, a region of undulating land centering around Mosul, Erbil (36°10'N - 44°01'E) and Kirkuk (35°28'N - 44°23'E). This region has a maximum breadth of about 85 miles in the central portion. The southern and western margin of the plains is marked by the Jabal Hamrin and its northeastern extensions. These plains, generally 700 feet or more above sea level, are formed into separate basins by the low hills and ridges which run in a generally northwest-southeast direction. Only a few parts of the ridges offer difficulties for cross-country movement and these can generally be bypassed. However, some of the larger rivers may present occasional obstacles to overland movement when in flood stage during the spring. In the winter the snowfall on the plains is not sufficiently deep to be a problem for movement on foot. Vegetation is generally lacking in the area. The major producing oilfield of Iraq is located in this region around Kirkuk and a lesser field and major refinery are located near Khanaqin (34°21'N - 45°22'E). Throughout the plains emergency landings could be made at selected locations.

Delta Lands:

The delta region of Iraq consists of a vast alluvial plain extending from about Samarra (34°12'N - 43°52'E) on the Tigris, and Ramadi (33°24'N - 43°17'E) on the Euphrates, to the Persian Gulf. It borders the desert in the west and extends into Iran in the east. Practically all of the region has a level, monotonous surface which is broken in places only by: a) the banks of the Tigris and Euphrates Rivers which are raised slightly above the level of the surrounding plain, b) the banks of some of the ancient canals and irrigation ditches, and c) the sites of ancient cities or mounds. Other than these features, differences in elevation are virtually nonexistent. Baghdad (33°21'N - 44°25'E), has an elevation of only 107 feet and from here the delta slopes gradually down to sea level at the Persian Gulf, a distance of over 300 miles. One result of this lack of relief is that lakes and marshes in the region have indefinite boundaries and fluctuate in area and location from year to year. These marshes and lakes are characteristic of the entire delta with the exception of the small northern sector above Baghdad. Many parts of the area, which do not receive water by normal flooding, are irrigated by canals and ditches. As a whole the delta lands are characterized by stretches of cultivated areas, marshland, and desert. Cultivation is usually limited to the vicinity of the rivers and canals.

Cross-country movement throughout most of the delta area is greatly restricted. During the spring floods travel by foot is at a minimum. The marshes and lakes can be crossed only by boat or canoe. The soil of this region is a fine alluvium, dusty when dry but a very sticky mud when wet.

Deserts:

Desert and semidesert lands comprise over one half of the area of Iraq, including virtually all of the western and southern parts of the country. Both the Western and Southern Deserts are vast, relatively flat tablelands continuing on into Syria and Saudi Arabia. The general slope of the land is downwards towards the Euphrates Valley.

The Western Desert, or Al Wudyan, is cut through by many deep wadies both large and small. Some of these may be as much as 100 to 150 feet deep, sometimes with very steep

sides forming canyon-like depressions. The general course of most of the larger wadies is east-west thus presenting difficulties to movement in a north-south direction. In the Southern Desert, or Al Hajara, the wadies are wider with more gently sloping sides. Despite the great extent of the wadies in both the Western and Southern Deserts they never carry water throughout their length, even after rains.

Al Jazira, the region lying between the Tigris and Euphrates Rivers north of Baghdad, is in many respects simply an extension of the Western Desert from which it is separated only by the narrow valley of the Euphrates. Characteristic of this area is the lack of exposed hard rock, which is more common to the south, and the more numerous depressions, some of which take the form of shallow basins or deep sinks with a depth of up to 240 feet. The Wadi Tharthar, which crosses Al Jazira from north to south, varies in width from 25 feet to 8 miles. The sides of this wadi and its tributaries are often steep and may be as much as 60 feet in height. Unlike all other wadies the Wadi Tharthar is perennial in parts of its course, and salt marshes along this area may hinder movement by foot.

Separating Al Jazira from the Western Desert is the long narrow oasis of the Euphrates valley varying in width from 5 to 10 miles. While the floor of the valley is level there is a steep escarpment along the right bank with a maximum height of 800 feet which forms a considerable impediment to cross-country travel.

In spite of the ease of foot travel over most of the desert surface, the very limited survival conditions existing during much of the year require the survivor to avoid the interiors of all extensive deserts unless accompanied by natives.

Rivers and Streams:

In non-desert Iraq, rivers, streams and the general drainage pattern constitute the major impediment to foot travel. This is especially true during times of flood. Maximum flood stage is reached throughout the country around May. Water levels begin to decrease in June and reach their lowest points in September and October. In the later month or in November the rise begins again and becomes pronounced by December.

The two major rivers, the Tigris and the

Euphrates, present formidable obstacles. In the north, above Mosul, the steep banks of the Tigris are the chief impediments to crossing while farther downstream the width is the major difficulty. Minimum width, except for the extreme north where it is 40 yards at one point, is 60 to 70 yards at the narrows between Al Azair (31° 19'N - 47° 25'E) and Qal'a Salih (31° 31'N - 47° 17'E). Elsewhere it may be as wide as 250 yards or more. At low water the Tigris can be forded at some selected places. Near Qal'a Salih, for example, the depth in early fall may be only 3 to 4 feet. Nevertheless the marshy conditions of the valley between Kut al Imara (32° 30'N - 45° 49'E) and the mouth of the Shatt al Arab present a difficult obstacle to the potential crosser.

The Tigris is more subject to floods than is the Euphrates and during the maximum high water levels which are reached in March, April and May it may rise as much as 22 or more feet, sometimes at a maximum rate of a foot an hour. At this time extensive areas of the lower valley will also be flooded. The lowest levels of the Tigris occur in September and October when the banks in some places may be as much as 20 to 25 feet above the surface of the water. The normal velocity of the river, below Mosul, ranges from about 1½ to 6 miles per hour depending on the season and the location. South of Kut al Imara the Shatt al Gharraf, a secondary channel of the Tigris (and former main channel) runs southward through marshy land until it disappears in the marshes near An Nasiriya (31° 03'N - 46° 13'E).

The plains and mountains of northeastern Iraq are cut through by several rivers and many small streams, some of which will present obstacles to the survivor during the flood season. Most of the rivers and streams in the mountains are permanent though they carry very little water in the fall and are fordable at this time. In May and early June, the period of snow melt, they are at their maximum height. In the mountains the swift currents of the streams flow in narrow steep-sided valleys and gorges which widen as they approach the plain. All of the major streams in this area are tributaries of the Tigris.

In the deserts the streams or wadies are intermittent, flowing briefly only after the winter

rains, otherwise completely dry. The single exception is the Wadi Tharthar which is perennial from around Balad Sinjar (36°20'N - 41°51'E) to below Al Hadhr (35°33'N - 42°41'E) where the waters may be 25 to 30 feet in width and as deep as 5 to 6 feet after the winter rains.

Swamps, Marshes and Lakes:

The great majority of the marshes and lakes of Iraq are found in the delta lands, an area of many difficulties for cross-country movement. In the delta all forms of surface water are interconnected with the Tigris-Euphrates system by means of subsurface drainage and all rise and fall at the same time. Consequently maps of this area differ widely as to the boundaries and location of marshes and lakes and no map can be expected to be accurate in this respect for more than a few years. Most of these lakes and marshlands are found along the banks of the Euphrates below Al Kifl (32°12'N - 44°22'E) and along the Tigris around and below Kut al Imara. They extend south to the Persian Gulf and occupy many parts of the area between the two rivers. These marshes and lakes are usually only a few feet deep and may be used by shallow draft boats.

Four areas of lake and marsh offer particular difficulties. The northernmost of these is the Hor as Suwai iya (32°40'N - 46°00'E) above Kut al Imara on the left bank of the Tigris. This shallow lake is about 28 miles long, east to west and about 22 miles in width. However, the size and shape may vary and the borders are usually muddy. Running northwest from this lake for some 65 miles is an area of marshland subject to intermittent flooding. On the right bank of the Tigris southwest of Kut al Imara is the Hor Dalmaj (32°20'N - 45°28'E), which is about 95 miles long and about 9 to 12 miles wide. During the dry season it may be considerably smaller, however. This marsh lake is not indicated on some maps of the area.

West of Amara (31°50'N - 47°10'E) on the right bank of the Tigris lies the Hor as S'adiya (32°00'N - 46°48'E), an area of marsh and lake which may carry half the water of the Tigris during flood. At its maximum extent the Hor as S'adiya is 80 miles long, 12 to 15 miles wide and from 2 to 8 feet in depth. Sometimes connected to this lake is an extensive tract of marshy ground found on both sides of the river below

Amara and extending as far south as the marshes of the Euphrates. It is possible, however, to walk along the right bank of the Tigris between the river and the marsh except after heavy rains.

The Hor al Hammar, northwest of Basra, is fed not only by the Euphrates but by several channels of the Tigris as well. Many of its waters join the Shatt al Arab above Basra (30°30'N - 47°49'E). It is about 70 miles long east to west, about 8 or 10 miles in width at low water, and is quite shallow.

In addition to these lakes and marsh-lakes much of the area consists of intermittently flooded marshland. This is also true of large parts of the general delta region below Baghdad. Many large areas never indicated as marshland on the maps may be inundated during high floods if the levees are breeched. As a general rule all extensive areas of marshland or open water should be regarded as impassable except by boat or canoe.

The only true permanent lake of any size in Iraq is Al Habbaniya (33°15'N - 43°30'E), west of Baghdad. At normal water level it has an area of 60 square miles and a depth of 12 feet. At flood time, however, it receives additional water from the Euphrates and expands to about 150 square miles. The overflow drains into a marshy lake to the south, the Bahr al Milh (32°42'N - 43°33'E), which covers an area about 50 miles wide.

Coastal Areas:

The coastline of Iraq is limited to a 36 mile strip of low, flat, poorly drained land at the head of the Persian Gulf. The terrain is subject to partial inundation during times of high tides or heavy gales. Mud flats, cut through by many channels, extend inland for as far as 40 miles. In the wet season much of the desert area between Basra and the Gulf becomes a morass of slate gray mud. Even in the dry season movement will be impeded by the tidal flats and channels.

VEGETATION

Forests:

In Iraq forests are found only in the mountains of the northeast at altitudes between 2,000 and 6,000 feet, often on the ridges or in the fields of the basin areas. Nearly all the trees are de-

ciduous and the forests are primarily oak. In recent years there has been a considerable destruction of trees, especially near villages. Away from habitations, however, the trees grow as high as 50 feet and may have thick trunks and large spreading crowns. The vegetation of the forest lands presents no serious obstacle to movement by foot. Wood for fuel is prevalent.

Scrub and Brush:

Scrub and brush vegetation is found throughout Iraq. In the mountains where the forest has been cut, a growth of heavy shrub usually appears, consisting of maple, hawthorne, juniper, wild pear, and a kind of sumac. In some of the mountain basins natural grasslands may be found which often grow to a height of 4 or 5 feet. In other parts of the lower mountain valleys various kinds of marsh plants are found including low perennial grasses, shrubs, herbs and, along the streams, giant reed grass, willow and ash. Parts of the plains region at the base of the mountains are covered with low bushes and grasses.

The thickest concentrations of scrub and brush are to be found in the marshlands and along the river valleys. Between Basra and Baghdad large areas of the marshes and lakes in the delta are covered with dense thickets of reeds and brushes and are all but impenetrable. These reeds sometimes grow to a height of 15 or more feet above the surface of the water and provide excellent concealment. Almost completely overgrown are the western parts of the Hor al Hammar and most of the Hor al Hawiza (31°35'N - 47°38'E). South of Basra along the mud banks of the Shatt al Arab are found dense communities of sedges and, in summer, tall grasses. At the bend of the Tigris and Euphrates and on the river islands, poplars and willows sometimes grow in small clusters. Unlike much of the other marsh vegetation, however, they do not provide good fuel.

The heavy undergrowth in the delta often includes a very common loose, straggling, thorny shrub which in some places, especially along the Tigris, forms impenetrable thickets over 7 feet high. More often it is not over 3 feet in height since it is cut by the Arabs for fuel. This shrub is also found in lesser quantities in the plains and mountain valleys of the northeast. Many of the

former cultivated areas in the delta are now covered with fairly dense patches of scrub and brush. The liquorice plant, which is common in the delta, is an excellent source of fuel. Also utilizable for this purpose are the various types of brushwood, date fronds, and camel thorn. The scrub and brush vegetation of the delta will provide many areas of excellent concealment, but at the same time will present many obstacles to the movement of the survivor, especially when considered in conjunction with the large expanses of ever present surface water.

The deserts, the remaining region of scrub and brush vegetation are largely barren throughout much of the year except after the winter and spring rains when virtually all parts of the area have a plant life which is often richly developed. At this time parts of the desert are used extensively for grazing lands, especially in Al Jazira and along the northeastern or Euphrates side of the Western and Southern Deserts. The plant life includes low bushes, usually no higher than 2 feet, and flowering bulbous plants. The most important desert plant is camel-thorn. After the rains are over in the spring this vegetation either disappears entirely within a few weeks or else consists only of a few unevenly dispersed perennials. Some parts of the desert are completely without plant cover during the dry season.

Cultivated Crops:

Cultivated plants occupy only about 3 to 5 percent of the total area of Iraq. They are found in parts of the delta, the plains, the mountain valleys and along the river valleys of the Tigris and Euphrates. In the rainfall zone of the north much of the plains area around Mosul and Erbil is under cultivation. Here wheat and barley are the principal crops but fruit orchards and olive groves are found where there is local irrigation. In the mountain valleys and basins, fruits, tobacco, and grains are grown.

In the south, the Shatt al Arab is bordered by a belt of date palms about one or two miles in width. The absence of undergrowth throughout most of the area makes movement relatively easy. In the few desert oases, cultivated plants are restricted mostly to date palms, pomegranates, wheat and barley.

CLIMATE

General:

The climate of Iraq varies widely in different parts of the country. In summer the region including the Persian Gulf and a large part of the lower delta is one of the hottest and most oppressive parts of the world. The deserts are also universally hot but are usually less oppressive than the lower delta and sea coast. In the mountains the weather is much cooler than in any other part of the country. Climate is affected locally by altitude and by proximity to the marshlands, the mountains or the sea.

Iraq has only two basic seasons, winter and summer. Both spring and fall are of very short duration. In summer, which lasts from May through September or later, there is intense heat and very little rain. The winter season, which lasts from November to April, is accompanied by heavy rains which turn much of the land, especially in the delta, into a morass of sticky mud. In the mountain region of the northeast the winters may be quite severe. Snow falls both here and on the plains at the base of the mountains. Frost may occur everywhere but in the extreme south.

Temperature:

Temperature will be a factor of primary importance to the survivor during the summer. Absolute temperatures of 125°F. have been recorded near Basra and at At Diwaniya (31°58'N - 44°55'E.) during August, the hottest month. Shu'aiba (30°26'N - 47°40'E.) has recorded temperatures of 100°F. during every month except December, January, and February. Above the lower delta area the nights are cooler, especially around Mosul and in the Western Desert. In the Kurdish Mountains the altitude considerably reduces the heat in the summers. Some mean daily minimums and maximums for representative parts of the country during the month of August are: a) Baghdad: 79 F. and 110°F.; b) Mosul: 73 F. and 107 F.; c) Rutba (33° 04'N - 40°18'E: 72°F. and 102°F.; d) Shu'aiba: 79°F. and 112°F.

December, January, and February are the coldest months of the year in Iraq. Unofficial absolute minimum temperatures as low as 0°F. have been recorded for Mosul in the north. In the moun-

tains of Kurdistan temperatures are somewhat lower but figures are not available. The southern part of the country is considerably warmer than the north. At Shu'aiba for instance, there is only one official reading below 20°F. Mosul, on the other hand, has never recorded more than 66°F. during January and this is exceptional. Recorded mean daily minimums for January range from 34 F. at Mosul to 44 F. at Basra. In general Iraqi winter temperatures are below those of countries in comparable latitudes. In winter, warm clothing will be necessary throughout Iraq, especially in the deserts, the northern plains and the mountains.

Humidity:

Relative humidities are generally low in summer and high in winter. Along the coast, however, summer humidities average 70 percent with little variation day or night. Inland these conditions change rapidly, for at Shu'aiba mean summer relative humidities may be as low as 27 percent. There is, however, a fairly wide day to day variation from this mean. Throughout the country humidities are highest in the early morning and lowest in the afternoon.

Precipitation:

Iraq has almost all of its rainfall in the winter and spring from November through April, the peak falling in January. From June through September there is virtually no rain and both May and October have only a few wet days. The average for each of the wet months does not exceed 2 inches except in the northern part of the country. In the Kurdish Mountains the rainfall is considerable and several locations record average annual falls of over 40 inches. Often there is at least some rain every day for several weeks at a time. This is in sharp contrast to the rest of the country where there are relatively few rainy days so that the rain, when it comes, is apt to be heavy. Of the recorded stations the mean number of days with precipitation varies from 16 at Basra to 64 at Kirkuk. During the rainy season the Delta area is turned into a sea of sticky mud. To avoid being caught by sudden floods, wadi bottoms and other low places should not be frequented in the rainy season.

Snow falls every year on the mountains of

Kurdistan and on the plains east of the Tigris. Elsewhere it is almost unknown. In the higher parts of the mountains periods of bad weather with snow may last for two weeks or longer and passes are often blocked to animal transport. The time of the heaviest snowfall is January and February but the highest mountains near the Iranian border are often covered with snow for considerable periods of time from November through March.

Winds:

With the exceptions of the Shamal and the dust-storms, winds are of little importance to the survivor in Iraq. The Shamal is essentially a sudden increase in both the strength and frequency of the northwesterly winds which occur in June and normally last until about October or November. It brings about considerable relief from the heat, not primarily by lowering temperatures but by increasing the rate of evaporation of perspiration from the skin. A rise in velocity during the day is generally characteristic of the winds of Iraq, and this is especially so of the Shamal during June and July. At this time the wind at Shu'aiba may increase from about 6 or 7 miles per hour in the very early morning to about 16 or 17 miles per hour in the late afternoon.

True sandstorms are rare in Iraq but dust-storms are common and are sometimes violent. While they can be encountered at any time of the year the most severe ones occur in northern Iraq in October, in central Iraq in March and in southern Iraq in June and July. Throughout the year they are much less common on the Western Desert than elsewhere. A stifling heat and clouds of dry dust which restrict visibility to as little as 20 yards make these storms extremely uncomfortable and frequently halt all outdoor activity.

Visibility:

Other than duststorms, mirage is the chief obstacle to visibility in Iraq. One of the most common forms of mirage is the appearance of water in the desert which results when the sky seems to drop below the horizon. The horizon itself may become very distorted and various natural formations may become either quite changed in appearance or may completely disappear. At other

times objects may appear to be much nearer than they actually are. Mirage is fully noticeable about three hours after sunrise but is absent prior to that time. In its worst stages mirage can reduce visibility to a few hundred yards. However, the survivor will find that its effects can be considerably reduced whenever it is possible for him to ascend even a few feet from the ground level.

Fog occurs most frequently in January and February though it is uncommon throughout much of the country. Shu'aiba has fog about 6 days a year, Baghdad 8 or 9, Rutba 4, and Mosul about 14.

PEOPLE

General:

The population of Iraq, consists of some 5,000,000 persons who cannot be considered as members of a single homogeneous national group since differences of religion, language, and culture serve to separate them into several distinctive ethnic groups and many more minor subgroups. The following figures are approximations of the population of the major ethnic groups of Iraq at the present time.

Muslim Arabs	3,568,000
Kurds	807,000
Christians (all sects)	190,000
Turkomans	50,000
Yezidis	15,000
Jews	6,500
Mandaeans	5,000

The population is concentrated for the most part along the rivers and canals of the delta region and in the fertile valleys of the northern mountains. Those areas with the heaviest concentration of population are: a) Baghdad and environs, including the canal zone to the north and east; b) in Basra province along the rivers from Al Azair on the Tigris and Jau Hammar (30°43'N - 46°45'E) on the Euphrates south to the mouth of the Shatt al Arab; c) in the valleys around Sulaimaniya; d) in the plains and foothills around Mosul, Erbil and Kirkuk; and e) locally along the upper Euphrates Valley. Remaining parts of the country have lesser concentrations of the

population with the exception of the desert which is largely uninhabited save for a few wandering Bedouin and shepherd tribes.

Ethnic Groups:

a. Arabs: Under this heading are described all of the Arabic speaking Muslims of Iraq. Although this ethnic group could be further subdivided into Bedouins, Marsh Arabs, Fellahin, and the like, it is felt that, in spite of the existing differences, these subgroups still possess enough basic features in common to justify their treatment as a single major ethnic unit.

(1) *Physical Characteristics:* Most Arabs are of slight build and range in height from 5'4" to about 5'8". Their skin color varies from light brown to dark brown. Hair color may be brown to very dark brown (usually called black) and is slightly wavy. In eye color Arabs range from gray brown through dark brown with some occurrence of blue. Noses are very variable—they may be high arched, they may be short and straight, or they may be of the Armenoid type. Usually, however, they are straight and slightly convex.

Since "Arab" is a linguistic term rather than primarily a racial one there is a fair amount of physical variability to be found between various Arab groups. Bedouin, for example, are generally of a slimmer build than are urban Arabs and have smaller hands and feet. Their eyes are deep set and both eye and skin color are relatively darker. Although urban Arabs tend to be heavier than Bedouin agriculturalists, true obesity is rare everywhere. Bedouin faces are broader and there is less incidence of the arched nose. Distinguishing features of Marsh Arabs are their round faces, large mouths, wide noses and high foreheads.

(2) *Dress:* Traditional Arab dress, still worn throughout the country outside the cities, consists of a long cotton gown or shirt usually covering a vest and baggy trousers, also of cotton. In colder weather a heavy sleeveless cloak of wool or camel's hair may be worn. Sandals have leather soles and knitted string tops. Hats consist of a cloth held in place by a coil of rope or wool around the head. For tribal sheikhs this head cloth is white with a gold or silver coil, while for others the cloth may be black and white or red and white with brown or black coils. This type of head covering is extremely functional and

offers excellent protection against the sun, wind, and sand. There is, of course, some individual variation in dress. Additions might include a long or short coat worn beneath the cloak and sometimes a sagger, indicative of the economic status of the wearer. Among the Marsh Arabs the men wear a waist belt and sometimes a cloak.

Women's traditional outdoor clothing consists of two large shapeless cloaks, one worn over the shoulders and the other over the head. These cloaks, which completely cover the whole person, are usually black in color. Women's indoor clothing, similar to that of the men, is usually turquoise blue. Arab women, except the Bedouin, must have their faces veiled or covered when in public.

Middle and upper class Iraqis in the urban centers have very largely abandoned traditional Arab dress. Western clothing is worn almost exclusively except for the hat which remains the symbol of the foreigner. Urban women of these classes have also adopted Western dress but often in public the face will be partially hidden or discretely covered by a veil. The urban lower classes generally wear such articles of traditional dress as are obtainable.

(3) *Customs:* Standards of behavior among the upper class Arabs are often superficially strict. Generosity, hospitality, courtesy, and dignity are greatly admired qualities but at times there may be a heavy emphasis on appearances rather than on deeds. Bad manners and rudeness are considered unpleasant and a high value is set on external politeness.

The Arab mind has been described as "lively, imaginative, and subtle," and the ability of all classes to easily understand new and complex problems has been noted. Arabs have a great love of speechmaking and are usually quite talkative, inquisitive and friendly. While they have sometimes been accused of laziness this is no doubt due in part to the culturally conditioned distaste for manual labor which is especially marked among the Bedouin and the townsmen of the middle and upper classes. The peasants are generally noted for their honesty in most ordinary transactions. If sufficiently motivated, however, they are capable of becoming very skillful thieves and adept at evasion from the authorities. During fits of rage, violence may occur.

The Marsh Arabs have a bad reputation among

the other peoples of their area, especially for piracy and treachery. In general, however, they take little interest in outside affairs and give little trouble. They are also said to be cheerful and high spirited, and, on occasion, fearless.

The patriarchal family is considered of great importance to all Arabs and is a strong force for conservatism. Breaches of family morality on the part of a woman, or even the suggestion of it, are often cause for her death. Tribal membership is also of the utmost importance to the Bedouin and shepherd nomads, but is of somewhat lesser significance to the semi-nomads and settled village agriculturalists, and is of little or no importance to urban Arabs. Authority rests with the sheikhs of the tribal subdivisions, of the tribes, and of the tribal confederation, but may be somewhat ineffective in the larger units.

Among the Bedouin the tribe is the protector of the individual member, and when in serious need he has the right to claim food, shelter and protection from his sheikh. Murder and theft are not considered crimes if they are committed against foreigners or members of another tribe rather than against members of one's own tribe.

Women's position in Iraq is much inferior to that of men. The wife has authority and responsibility in domestic affairs but in all else she must be subservient to her husband. Polygyny, though permissible, is uncommon and is restricted primarily to the more wealthy members of the middle class. Bedouin women, with the exception of the wives of sheikhs, are freer than others in Iraq and all are held in comparatively high honor and esteem.

There is a strong tradition of hospitality among the tribal sheikhs and strangers who call upon them are usually welcomed. The guest, according to his importance, will always have a seat near the host. When among the Bedouin he will be served bitter black coffee; elsewhere coffee may be plain, spiced, or heavily sweetened. On these occasions conversation between the host and guest may be quite variable, depending on the mood. It may be lively, casual or virtually nonexistent for long periods. Food is generally heaped on a large tray and eaten with the right hand while seated on the ground. Among the Bedouin the guest may be received in one of the large black tents, or, in the villages, in the small mud brick dwelling of the local minor sheikh.

(4) *Religion:* Islam is an all-important influence in the everyday life of the Arabs. In Iraq each religious group has its own laws, social customs, and traditions which tend to set it apart from all other groups. Loyalty to the religious community rather than to Iraq as a whole is quite common even for those persons who are no longer practicing members of their faith. One consequence of this emphasis on religion is that the religious leaders of Islam play a more important role in shaping the political opinions of most Iraqi Muslims than do the educational institutions, the press and the radio.

Islam in Iraq is not unified, however, but is split into the Shiah and Sunni sects. Although the Shiah Arabs outnumber the Sunni Arabs by about three to one, the ruling class is drawn from the Sunni minority, thus causing a portion of the difficulties in Iraqi politics. Shiahs, in fact, have often worked against the Sunni-dominated government. The Shiah are concentrated mostly in southern Iraq, but with few exceptions the Arabs of the north are solidly Sunni as are virtually all of the Bedouin and semi-nomadic tribes.

The Shiahs and Sunnis do share certain basic principles of Islam including the profession of faith, prayer, alms-giving, pilgrimage to Mecca, and fasting from sunup to sundown during the month of Ramadan. Prohibitions against pork and alcohol are, with some notable exceptions for the Sunnis, generally strong in both sects. Dogs are regarded as unclean by all. Both sects have "mullas" or village priests and school-teachers, as well as "muftis" who are the religious leaders and heads of the principal mosques.

The fundamental difference between the two sects lies in the disagreement over the succession of religious leadership but numerous other differences are found in the religious practices. The most important Shiah celebration takes place during the first 10 days of the month of Moharram when large groups of Shiahs may become frenzied and practice self-flagellation. During these times sudden outbursts of violence could occur.

Sunnis represent the orthodox members of Islam and in Iraq are noted for their tolerance and general absence of any fanaticism. Among educated Muslims and in city dwellers as a whole, both Shiah and Sunni, there is a considerable amount of indifference to religious observances although there is little direct criticism of religion.

Throughout the country the peasant and tribal groups represent the strongholds of religious feeling and observance.

(5) *Political Beliefs and Attitudes:* A major characteristic of politics in Iraq is that the great majority of the population take little or no interest in governmental affairs except insofar as they themselves are directly affected. Public opinion exists mainly in the larger cities and is primarily a product of the educated white collar man, the professional workers, and the student. The latter is often the most outspoken in criticism of governmental policy. Iraqis as a whole, however, are very sensitive of criticism from foreign sources.

Many Iraqis consider any sort of governmental authority to be nothing but oppression and in more remote areas it is often flouted, especially when it comes into conflict with established customs. This is particularly true in the tribal areas where there may already exist a strong basic dislike of town and city dwellers. Most Iraqis distrust governmental officials who are consequently set apart from the rest of the population as a special group.

(6) *Languages:* Arabic is spoken throughout all of Iraq except in the north. As the native language of all Muslim Arabs and some Christians as well, it is spoken by about three-quarters of the population. Iraqi Arabic, similar to that spoken in central Arabia, has varying dialects in different parts of the country but all are mutually intelligible for basic communication. Most of the general population do not completely understand classical Arabic which is used only for formal occasions by the well educated.

Of all European languages, English is the most widely spoken. Some English-speaking Arabs could probably be found in most towns, especially those which are centers for governmental activities, trade or the oil industry. In Baghdad, English is used as a business language and many educated urbanites are graduates of American or English universities.

(7) *Occupations:* Rough estimates indicate that perhaps 80 percent of the total population of Iraq derive their living from farming or stock-breeding. These activities include the camel-breeding of the Bedouin, the sheep-breeding of the nomadic and semi-nomadic tribes, and the agricultural practices of the numerically dominant, settled fellahin. The largest and most im-

portant single occupational group of the country is that of agricultural laborer. Tenant farming is prevalent throughout Iraq except in the plains and hills of the northeast. In all agricultural and nomadic groups the women play an important role in the family economic life.

Of the remaining 20 percent of the population classified as urban, about one-half can be considered active economically and it is from this group that the workers in industry and commerce are drawn. However, at least half of these are engaged in handicrafts and home workshops, including rug-making, shoemaking and copper-smithing.

(8) *Types of Currency or Exchange:* The monetary unit of Iraq is the dinar which is the equivalent of one pound sterling and therefore worth about \$2.80 (1958). Smaller units of currency are the riyal worth about 56¢; the dirham, worth about 14¢; and the fils, worth a little over ¼¢.

b. Kurds:

(1) *Physical Characteristics:* Kurds average about 5'6" in height though some may be as tall as 6'0". The face is generally long and narrow and the nose either straight or convex. The complexion is usually olive, the hair dark brown, and the eyes brown. A minority of Kurds, however, may be blue-eyed, fair-haired and fair-complexioned.

(2) *Dress:* Kurds are easily distinguishable from Arabs by their widely different clothing styles. The basic items include a pair of wide trousers and a long calico sash worn wrapped around the waist in which money, weapons or other personal items may be carried. On the upper part of the body a wide sleeved shirt and a short quilted jacket are worn, perhaps covered by a long cloak. A vest made of one inch thick felt may sometimes be worn during cold weather or as a kind of body armor. A fringed turban is worn on the head and leather slippers or boots on the feet. Bright colors and striped cloth are the preferred clothing styles for both men and women. The latter usually wear trousers and a long gown reaching to their feet, sometimes covered with a long coat. Female headwear consists of a small handkerchief or turban. The men may often carry a rifle, long decorated dagger, or club.

(3) *Customs:* Among many people the

Kurds have long had a largely undeserved reputation for treachery and untrustworthiness. For the most part this reputation arose from the numerous blood feuds and other entanglements which often make the Kurd's life a dangerous one and sometimes requires him to shoot first in the interests of self preservation. They do however, have violent tempers, and outbursts may on occasion result in bloodshed or death. In private quarrels or in relations with the government their normally high standards of honesty and integrity may break down completely. They are less friendly and inquisitive than the Arabs but are much less afraid of manual labor and are considerably more energetic and enterprising. To Kurds, boldness and bravery are the primary things upon which a man should be judged. Once accepted as their friend, they are usually considered to be more faithful than the Arabs and people who have lived with them have always learned to respect them.

The tribal system is of great importance to most Kurds, especially since each tribe is usually antagonistic towards all other tribes in the area, or at least suspicious of them. The tribes are generally comparatively small, numbering hundreds of families rather than thousands as is often the case with the Arabs. Each Kurdish tribe and each subdivision, or clan, kinship group and village, has its own chief or agha. In the nomadic tribes the agha generally has more power than he does among the more sedentary tribes. Aghas of the large tribal confederations or the larger tribes are often unable to control the actions of the lesser chiefs who may be frequently fighting among themselves. The next person in authority after the agha is the mulia or religious leader who is usually subservient to the agha but is sometimes in open conflict with him.

A Kurdish institution is the guest house which is open to all strangers. It may be either a part of the agha's house or tent or separate building. The obligation of hospitality is considered of great importance by all Kurds. After an initial exchange of compliments the guest is expected to make a present to his host. Any imported articles are assumed to be costly and therefore would make good presents for this purpose.

Characteristic of Kurdish life is the comparatively great freedom of the women who probably have more equality with men than those of any

other Muslim community. They have, on occasion, even become leaders of tribal groups.

(4) *Religion:* All Kurds are Sunni Muslims and are usually less liberal and more apt to fanaticism than their Arab counterparts. The aghas sometimes demand strict adherence to the external forms of piety, especially in the villages.

(5) *Language:* The language of all Kurds is Kurdish, an Indo-European tongue using the Arabic script and related to Persian with which some intercommunication is possible though difficult. There are four major dialects of Kurdish in Iraq and many minor ones, some of which are not mutually intelligible. In general bilingualism is not widespread. Knowledge of Arabic is restricted to the towns and governmental centers and Persian is spoken only in limited areas. There can be no assurance of anyone understanding English in a given location, though it can be spoken by some persons.

(6) *Occupations:* The most important occupation of the Kurds are related either to agriculture, to herding, or to some combination of the two. However, they also serve as porters in southern Iraq and in recent years have worked as laborers on road building projects and as policemen and soldiers.

(7) *Location of Population:* The Kurds, representing about 17 percent of the population of Iraq, are restricted to the northeastern part of the country. As a group they extend south as far as Qizil Ribat (34°08'N - 45°06'E); in the west they occupy the eastern parts of the Assyrian plain including Kirkuk and Erbil, and in the north and east they extend to and beyond the Turkish and Iranian borders.

c. Christians (All Sects):

(1) *Physical Characteristics:* Iraqi Christians, with the exception only of the Armenians, are similar to the general Arab physical type.

(2) *Dress:* Men's clothing is generally comparable to that of the Muslim Arabs. Women's clothing, on the other hand, tends to be more distinctive with the more elaborate outer dress which is often worked in gold or silver thread. In some areas a decorative headdress of gold and beads is worn.

(3) *Customs:* It is often claimed that most Iraqi Christians are ethnically the same as other Arabs except for their religious differences. As a

very broad generalization this may hold true, but many Christian sects, especially the Assyrians, have acquired the distinctiveness of separate ethnic groups by their exclusiveness and voluntary segregation into their own urban, village and tribal communities. Some sections of Mosul and Baghdad are exclusively Christian as are some small towns and villages in the north. Many Christians, however, mix freely with the Muslim majority in schools, at work, in the government and socially. A distinguishing feature of Christian women is their greater freedom. Many occasionally join their husbands at social functions.

It is generally believed that Christians in Iraq adapt themselves more readily to modern inventions, improvements and education than do the Muslims. On the other hand, as a result of their past persecutions, they are more apt to resort to dishonesty and dissimulation than are the Muslims.

(4) *Religion:* Of the approximate 190,000 Christians in Iraq the majority are Roman Catholics, or rather Uniates of the Roman Catholic Church. These include Chaldeans, the largest single sect, and Syrian, Armenian and Greek Catholics. Protestant groups include Nestorians (Assyrians), Jacobites, Armenian and Greek Orthodox. Christians look upon themselves not as a single group but rather as members of different denominations, each of which has its own customs and liturgies, and each of which looks upon the others with a mutual suspicion and distrust. All Iraqi Christian sects have clung to their traditional faiths with a great deal of persistence despite occasional persecutions, some political repression and the inducements and persuasions of the Islamic community.

(5) *Language:* Throughout southern Iraq, Arabic is spoken by Christians as well as Muslims. In the north the majority of the sects, including the Chaldeans, Nestorians, Jacobites and Syrian Catholics, speak a version of Syriac, a Semitic language related to Arabic but too dissimilar to be mutually intelligible. Some Christians will be found who can speak English, especially in northern Iraq among those educated by American Mission Schools.

(6) *Occupations:* The majority of the Christians in Iraq are employed in agricultural pursuits. Those who serve as clerks or businessmen, however, are generally claimed to be superior in in-

dustry and efficiency. Chaldeans provide the main supply of firemen and deckhands for the river steamers and many others work on the Tigris as raftsmen. Nestorians (i.e. Assyrians) are often found as servants and clerks in hotels, offices and foreign households.

(7) *Location of Population:* The majority of the Christians in Iraq, about 70 percent, live in the northern part of the country and are concentrated in Mosul and its outlying villages in the plain, although they may be found throughout the area above the Little Zab. There is also a large Christian community in Baghdad and a smaller one in Basra.

d. Turkomans: Turkomans comprise about one percent of the population of Iraq and are located in the northeast around Kirkuk. They form a sort of buffer group between the Arabs and the Kurds. In appearance they have rather high and narrow heads, long faces and noses, black hair and brown eyes, and in height average about 5'7" with slender but sturdy body builds. Clothing styles resemble those of the Kurds. Their language is Turkomani which is very similar to modern Turkish.

In religion the majority are Muslim, of which two-thirds are Sunni and the rest Shiah. Some Turkomans, however, are Qizilbashi, a sect combining portions of paganism and Christianity with an overlay of Islam. In occupation they are mostly settled agriculturalists. As a result of their linguistic and cultural differences they find themselves set apart from both the Arabs and Kurds.

e. Yezidis: The Yezidis, numbering about 15,000 or more, are similar to the Kurds in appearance, in many aspects of their culture, and speak a dialect of Kurdish. They inhabit the Jabal Sinjar and the area northeast of Mosul. Their most distinctive feature is their religion which more closely resembles the ancient Zoroastrianism than any other, although Christ is respected as an angel and Mohammed as a prophet. The main emphasis lies on the placation of the devil rather than the worship of a supreme being.

They are much despised by Muslims in Iraq, a feeling which is reciprocal.

f. Jews: Although there were formerly over 100,000 Jews in Iraq, recent mass migrations to Israel have drastically reduced this number to about 6,500. Physically, linguistically and culturally they have a very close relationship to the

Arabs. They are primarily urban in residence and are active in the economic life of the country, including trading and money lending. Most Iraqi Jews belong to the strict Karite sect. In general a bitter antagonism exists against them owing to the Arab-Israel dispute.

g. Mandaeans: Mandaeans number about 5,000 or more and are found mostly around southern Iraq from Baghdad to Basra. They live mainly in towns and are famous for their skill in boat-building and silverwork. They are a pagan group who emphasize the importance of baptism and frequent ceremonial abutions. They speak Mandaean which is related to Aramaic but many are proficient in English. Their most distinguishing feature is a pronounced hairiness among the men. Physically they resemble Iranians more than Arabs.

h. Iranians: Upwards of 40,000 Iranians live in Iraq, either along the Iranian frontier or else in the Shiah holy cities of Karbala, An Najaf and others. These Iranians are primarily occupied with the pilgrim traffic, a large part of which is Iranian. Physically, culturally and linguistically most of them may still be considered as Iranians.

SUBSISTENCE AND SURVIVAL

Food:

Throughout inhabited Iraq some sort of food will usually be available to the survivor. Cultivated plants provide the main source of food though livestock, poultry and some game can also be utilized. In the desert it may be impossible to obtain any food throughout most of the year. The desert Bedouin subsist mainly on milk from their camels, sheep or goats plus dates and occasional feasts of meat and rice.

a. Plants: Of the total land areas of Iraq, not over 5 percent is cultivated at any one time. The rain fed zone in the north and northeast accounts for about 30 percent of this cultivated land and the irrigated zone in the central and southern portions of the country comprises the remainder.

Grains constitute about 85 percent of the total crop. Of these wheat and barley are the most important and constitute the staple diet. Wheat is the leading food item in many urban centers but barley is still important in some of the rural areas. Third in importance is rice which is eaten widely

in the southern part of the country and which is also popular in the cities. Grains of lesser importance consist of millet, grain sorghum and corn.

In some parts of the country the diet of grain foods is supplemented by vegetables or fruits. Vegetable production is concentrated in Kurdistan and in the vicinities of the larger cities, especially around Baghdad where there is a large market gardening industry. Summer vegetables include melons, pumpkins, tomatoes, onions, cucumbers, beans, potatoes, and egg plant. In the winter some areas produce carrots, cabbages, cauliflower, turnips, spinach, lettuce, radishes, celery, and beets. For much of the rural population, however, vegetable consumption is limited. The Bedouin, for example, are restricted largely to onions.

Fruits, with the exception of dates, are grown mostly in central and northern Iraq. The most important location lies between the Diyala River and the Khalis Canal north of Baghdad. Here are found oranges, lemons, limes, pomegranates, peaches, nectarines, apricots, cherries, plums, apples, pears and the like. In Kurdistan grapes are the principal fruit crop. They are in season between August and December and in some areas are picked and dried in the open at this time. Olives and figs are to be found in northern Iraq, the former around Mosul and the latter near the Jabal Sinjar. Nuts, including almonds and walnuts, are grown fairly extensively in many parts of the mountains.

Groves of date palms are concentrated along the Shatt al Arab in a strip 1 to 3 miles wide and 120 miles long. This area contains about half of all the date palms in the country. The remainder are scattered along the Euphrates as far north as Baghdad. Dates are harvested in August when large groups of migrant workers are found in the groves. Both fresh and dried dates are an important basic food item for Iraqis and could be utilized to advantage by the survivor owing to their food value, portability and state of preservation. Of the several stages of ripeness the last three are fully edible. They are usually carried by the nomadic tribes on their seasonal migrations.

Non-cultivated food plants are not common in Iraq. However, in the delta from Baghdad to Basra the caper is often found, which is a trailing

shrub with bambels, a large white flower and fig-shaped fruits. These fruits burst open when ripe and expose an edible red interior. The liquorice plant, the dried roots of which are the source of commercial liquorice, is found abundantly throughout the country in uncultivated areas. In the northern mountains pistachio nuts grow wild.

Poisonous plants present no special problems. The most dangerous is the oleander, an evergreen shrub with white, pink or red flowers usually found growing back from the edge of stream banks in the lower basins and valleys of the mountains. There is also a bean (*Vicia faba*) which is used extensively as a food, but may nevertheless be poisonous in the raw state to some susceptible individuals.

b. Game: Throughout much of the country some game is available which could contribute to the survivor's larder. The hare is common and has a broad distribution. In the southern area the small Persian mongoose is widespread. Around the rivers and marshes the otter is sufficiently common to be hunted by the natives. In both the cultivated areas and on the desert's edge the long eared hedgehog may be found. In the desert interiors a few gazelle may still be seen in addition to the several different species of rodents, all of which live in deep burrows and are the only other mammals to inhabit this section of the country.

Potentially dangerous animals include the Indian jungle cat, a powerful animal about the size of a jackal which is found in areas of thick scrub. The wild cat, the hyena and the jackal are also to be found in certain parts of the country. On the fringe of the marshes and along the Iranian border wild boar exist in large numbers.

Many types of birds can be found in Iraq throughout most of the year. Large numbers of geese and ducks winter in the marshes and pelicans can sometimes be found by the thousands. Storks regularly pass through the country, some staying for the winter and a few nesting. The black partridge is plentiful wherever there is thick scrub or cultivation and a smaller partridge-like game bird is found in the hills of the northeast. Quail are often seen in the spring and autumn and snipe remain throughout the winter in fairly large numbers. Other game birds include rails, sandgrouse and pigeons. Around Basra woodcock have been taken. Larger birds found in Iraq are the eagle, kite, osprey, falcon and buzzard.

Fish are plentiful in the Tigris, Euphrates and Shatt al Arab. Members of the carp family predominate, some of which are quite large. The rivers also contain catfish, and, in the lower reaches, shad, mullets and anchovies. The Ganges shark, adaptable to fresh water, has been found as far north as Baghdad.

c. Domestic Animals: Fat tailed sheep are the most important single type of livestock in Iraq. They are found throughout the country with the exception of the cultivated areas, the marshlands, and parts of the deserts, and usually are owned by the nomadic or semi-nomadic tribes. In the winter and spring they may follow the growth of vegetation in the desert but in the heat of the summer they are herded near the water supplies of the rivers and canals. In the north a few shepherd tribes still pasture their animals in the high mountains in the summer and migrate to the valleys and plains in the winter. Goats are sometimes kept with sheep, especially in the north. Often they can survive where the grazing is too scanty to support sheep or cattle, such as in areas around villages or nomadic camps and in parts of the desert. The distribution of cattle is similar to that of sheep but they are owned mostly by settled agriculturalists. Water buffalo, kept mainly for their rich milk, provide one of the basic sources of subsistence for some of the non-agricultural tribes living along the lower Tigris and Euphrates Rivers.

Poultry can be found everywhere throughout inhabited Iraq and includes chickens, turkeys, ducks, geese and pigeons. Their quality is reasonably good and eggs are plentiful.

Water:

a. Availability: Water is generally available throughout Iraq with the single exception of extensive areas of the desert. In the mountains, foothills and plains of the northeast water is obtainable almost everywhere from either streams, springs, or wells. The Karez system, found only in the plains, consists of a series of deep widespread wells interconnected by means of underground tunnels. In most of the alluvial plain of the Tigris-Euphrates system, water is available from the rivers, tributaries, canals, irrigation ditches and marshes. In the desert areas, however, the scarcity of water throughout much of the year may make survival completely impossible.

With the single exception of the perennial Wadi Tharthar in Al Jazira, the only time the desert wadies carry water is for brief periods after the winter rains. At this period surface water can be obtained from scattered pools which, in some areas, last until the summer. For the rest of the year, however, water is restricted to wells and semi-permanent water holes, many of which are a considerable distance apart. The former will be of little or no use to the survivor since, owing to their depth, a container and a hundred or more feet of rope may be necessary to obtain the water. Water may sometimes be found by digging shallow holes in dry wadi beds or hollows where it collects and stays near the surface. These holes will fill slowly with good water but only last for a few days after which the water becomes bitter and new holes must be dug. In the larger wadies there is usually some certainty of finding water after digging but the smaller ones are much more unpredictable. Wells and cisterns are usually located at intervals along the caravan routes but many are now in bad repair owing to lack of use. As a general rule the central desert areas of Iraq should be avoided, except possibly during and shortly after the rains. At all other times existence in the desert will be difficult even for brief periods of time and impossible for longer periods required to traverse the larger desert areas on foot. Peripheral desert areas could be used for lines of movement so long as the individual maintained contact with a water supply.

b. Purity: Throughout the northeast mountain region spring water, taken at its source, may be considered pure and potable without treatment. In the plains, however, all water should be treated before drinking. Locally some of the smaller tributaries in this area may be brackish. Throughout the alluvial plain of the Tigris-Euphrates system all water is subject to contamination and should be purified. Pollution is especially likely near population centers. South of Basra there is a high salt content in the waters of the Shatt al Arab, but drinkable water has been obtained to within four miles of the Gulf. Water from the marsh areas is drinkable after purification. In the large urban centers water supplies are treated before distribution, but in rural Iraq the village water supplies are usually unprotected. In some desert areas the available water may be brackish or bitter and sometimes undrinkable.

Shelter:

a. Natural: Natural shelter in Iraq is limited to limestone caves found in two localities. Along the Euphrates for about 30 miles downstream from Haditha (34 07'N - 42 23'E) there are a series of these caves in the cliffs bordering the right bank of the narrow river valley. Some of these are now in use as dwellings. In the mountains of Kurdistan near the trough of the Great Zab there are a number of natural caves in the limestone formation, the largest of which is near Havdian, a small town about seven miles northwest of Ruwandiz. Some of these caves have rather lurid reputations among the local inhabitants.

b. Man-Made: Man-made shelters, currently unoccupied and utilizable by a survivor are also very limited. In southern Iraq occasional villages of mud huts may be found which have been abandoned by the semi-settled tribesmen. In the deserts there are occasional old Arab forts, most of which, however, are in ruins.

Health Hazards:

Various diseases are widespread and the survivor may be exposed to the great majority of them at one time or another. The enteric diseases, or those spread through the intestinal and urinary tracts are common. Of these dysentery is prevalent, including both the bacillary and amebic varieties. The latter is prevalent throughout the country, especially in the delta region. The abundance of flies and the sanitary habits of the people are instrumental in the spread of these and other intestinal diseases. Localized outbreaks of typhoid and paratyphoid occur consistently and are caused by the contaminated food or water supplies which are also the source of frequent outbreaks of food poisoning. Blood in the urine may be symptomatic of schistosomiasis or bilharzia, a worm disease, which can be picked up through the skin by wading in the infected waters which are prevalent throughout much of Iraq. Though the victim generally suffers little if any pain, the results may be debilitating and on some occasions can be extremely painful and require treatment. Other worm diseases, including hookworm, are common but need not concern the survivor unduly. Cholera has been dormant since 1931.

Diseases spread by the respiratory tract include

smallpox, diphtheria and meningitis, outbreaks of which occur at periodic intervals. Pneumonia, influenza, bronchitis, tuberculosis and diseases of the nose and throat are quite common.

Of the contact diseases those of the venereal type are widespread, especially in the urban areas. Among the nomadic and semi-nomadic tribes of the Tigris-Euphrates there is a form of syphilis spread by non-venereal contact which has an infection rate of over 50 percent in some areas. Diseases of the eye include conjunctivitis and trachoma. Many of these, if left untreated, can cause permanent impairment of vision or blindness. Rabies is found in dogs, jackals and other animals.

Of the diseases spread by mosquitoes, malaria is the most prevalent. It is found throughout much of the country from the mountains to the Persian Gulf. Outbreaks of typhus occur almost annually but plague has recently been absent. Sandfly fever is common, especially in the delta region, during the months of May through November. Although it lasts only a few days and is never fatal it is incapacitating during its course. The sandfly is exceedingly minute and can pass

through an ordinary mosquito net. Dengue fever occurs in the south. Other miscellaneous diseases include undulant fever which can be picked up from raw milk or milk products, and occasional large scale outbreaks of infectious hepatitis.

One of the most serious health menaces to which the survivor will be exposed are the various forms of heat stroke which may occur during the summer in the desert or delta regions. Heat stroke usually develops by about the 3rd or 4th day of a protracted hot spell in which maximum shade temperatures may exceed 120 F. Preventive measures include an adequate intake of salt and protection from the direct rays of the sun.

Additional health hazards are the four types of poisons snakes which can be fatal to man. These are: 1) the horned viper of the delta region which may be easily distinguished by horn-like scales over the eyes, 2) the Levantine or blunt nosed viper which is gray and brown with dark spots or cross bands, and which inhabits the northeastern area from Baghdad north, 3) a species of cobra which is quite rare, and 4) the carpet viper found only in limited areas of Diwaniya province. While scorpions are common, especially in the north, their bite is rarely fatal.