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Edited by W. B. Fisher

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PART I

THE LAND

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CHAPTER I

PHYSICAL GEOGRAPHY

The present Iranian state covers an area of some 628,000 square miles (1,648,000 sq. km) and extends between latitude 25° and 40° N., and longitude 44° and 63° E. More than six times the size of Great Britain and approximately three times the size of France, which is the largest country in Western Europe, Iran has a frontier that has been estimated at 2,750 miles in total length, of which over half is sea coast, with 400 miles lying along the southern Caspian shore, and the remainder (1,100 miles) comprising the northern parts of the Gulf of Oman and Persian Gulf. From the extreme north-west to south-east—at approximately the frontier with Turkey and the U.S.S.R., close to Mt Ararat, as far as the Baluchistan border just east of *Chāhbār*¹—is a total distance of 1,450 miles; whilst an opposite diagonal, so to speak, from *Būshīr* (*Būshahr*) to the Soviet frontier north-east of *Mashhad*, would measure 830 miles.

Physically, Iran consists of a complex of mountain chains enclosing a series of interior basins that lie at altitudes of 1,000 to 4,000 ft above sea-level. These mountain ranges rise steeply from sea-level on the north and on the south, and equally abruptly from the very flat and extremely low-lying plain of Mesopotamia to the west. Eastward, and also in the extreme north-west, the highlands extend beyond Iran in the form of largely continuous and uninterrupted features: in the first area they are prolonged as the massifs of Afghanistan and Baluchistan (West Pakistan), and in the north-west as the plateau uplands of Russian Azerbaijan and eastern Asia Minor.

Most of the frontiers of Iran were delimited between 1800 and 1914, and in disposition show considerable correlation with local features of topography. For the greater part they tend to follow watersheds or riverlines, the break of slope between plain or plateau, and mountain ranges, or else they are related to areas of low human occupancy such as marsh, swamp, or arid desert. Included within the boundaries of Iran are a few, but remarkably small, expanses of lowland: mostly in

¹ So on modern Persian maps, but *Chāhbār* is an established variant, see V. Minorsky: *Hudūd al-'Ālam* (London, 1937), p. 373.

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Fig. 2. Iran: political. *Ostans* (provinces) numbered: 1 Central (Tehran), 2 Gilan, 3 East Azarbaijan, 4 West Azarbaijan, 5 Kurdistan-Kirmanshah, 6 Khuzistan-Luristan, 7 Isfahan-Yazd, 8 Fars-Banader, 9 Kirman, 10 Baluchistan-Sistan, 11 Khorasan, 12 Mazandaran-Gorgan.

the province of Khuzistan (which in terms of topography and geomorphology could be held to be part of the Mesopotamian plain), and also fronting the coasts of the Persian Gulf and the Caspian Sea. However, the width of these lowland strips is well under fifty miles, and often less than ten miles. Iran is therefore overwhelmingly an area of pronounced relief, with mountains a dominant element. The average height of the land surface of Iran can be regarded as being over 3,000 ft above sea-level—a feature repeated only in relatively few countries of the world, such as Spain, where the average is 2,000 ft, or again in Turkey, Mexico, Tibet, and Bolivia.

In terms of physical geography, Iran comprises the western and larger portion of a more extensive mountain zone that extends from

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eastern Asia Minor and the Caucasus as far as the plains of the Punjab. This entire upland is in fact spoken of by some writers as the Iranian plateau, despite the fact that politically it includes most of the state of Afghanistan and a large part of the territory of West Pakistan. Further, the term "plateau" is applied in a general way, by several American and English writers, to the whole upland mass; whereas French and German geographers, notably Derruau, Bobek, and Scharlau (as will be noted later in this volume) tend to restrict the term to the inner central basins of the Iranian state, and hence speak of the surrounding highland ring as a distinctive and somewhat separate mountain zone. In the view of the present writer there are no strong grounds for extending the connotation of "Iranian plateau" to include upland areas of Afghanistan and West Pakistan. Because of its political implications the term could be seriously misleading, and there is no clear physical unity within the wider zone thus denoted. In fact, the existence of a series of north-south-running ridges and divides tends to separate the southern desert basins of Iran from the Helmand lowland; and these ridges, although narrow and not especially imposing, nevertheless afford a reasonably precise basis for division. One could therefore speak with validity in purely physical terms of an Iranian upland zone that would correspond closely to the existing political unit. Any merit deriving from a strictly physiographical application of the term "plateau" regardless of national division is dubious and slight when set against the considerable political disadvantage inherent in it. Use of the term "Iranian plateau" will therefore, throughout the rest of this volume, be restricted to the upland area actually territorially within the boundaries of the present state of Iran. The matter of "plateau" generally, inclusive or exclusive of the surrounding mountain ring, is more difficult. A reasonable approach would seem to be to try to make clear in an individual context whether the writer implies only the interior basins or not, and this will be attempted whenever possible. Even though the single expression is neater, differing interpretations by individual contributors to this volume make necessary some detailed indication of what is meant.

In general form Iran has been likened to a bowl, with a high outer rim surrounding an irregular and lower, but not low-lying, interior. The rim is formed by various groups of mountain chains, some of which, especially in the west and north, are not only high and bold but also extensive in ground area; whilst those of the south and east are

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narrower, lower in general height, more interrupted by lowland basins, and therefore less of a barrier. In the east, however, climatic effects—chiefly aridity, with the accumulation of sand and rock debris—reinforce the diminished importance of relief: hence the concept of a physiographical “rim” to Iran can be maintained.

Most developed of all the mountain ranges of Iran is the Zagros system. This extends from north-west to south-east, defining as it were the principal “grain” of much of Iran, and occupying the entire western part of the country—about one half of the total area. Diverging from the northern Zagros in an easterly direction are the Tālish and Alburz chains, which, though narrower, are equally high and also relatively unbroken. The open side, so to speak, of this angle between the south-east-running Zagros and east-trending Alburz is closed to a partial degree, as we have already noted, by more scattered highland massifs—and there is no single collective name that can be applied to this group of irregularly disposed and detached ranges. “Eastern Highlands of Iran” is a makeshift used by some writers, but is open to the obvious objection that it would appear to denote a major and continuous system comparable with the Zagros and Alburz.

The remaining major physical units forming Iran are (i) the interior basins contained within the surrounding mountain rim; and (ii) small expanses of lowland, coastal and riverine, located on the outer periphery of this rim. It is scarcely appropriate to refer to the interior as a single extensive basin, but better as a complex of several hollows or drainage sumps lying at varying altitudes, and delimited by irregular but sometimes imposing topographical divides which in certain instances become considerable mountain ranges.

Since mountains make up much of the scenery of Iran, there are two types of topography: that of the mountains themselves, or else a juxtaposition of remarkably flat stretches with upland ranges. Over much of the inner Iran, and again on the extreme outer parts, one has the impression of flats and levels, sometimes wide and extensive, sometimes restricted, but almost always limited at short or long distance by an abrupt mountain wall.

When we examine the general geographical aspects of Iran, it is convenient to proceed on the basis of the major physical units discussed above, even though these are of considerable size. We can therefore arrive at four major divisions of the country: the Zagros system, including small outer plains (chiefly the *Khūzistān* region), which are

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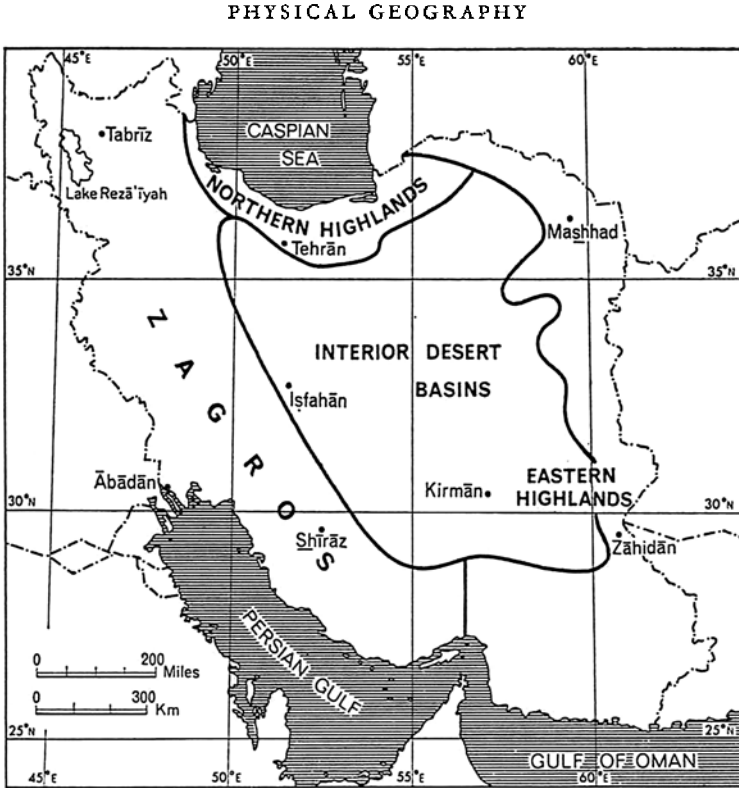
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Fig. 3. Iran: physiographic units.

part of the Mesopotamian and Persian Gulf lowlands; the Alburz and associated Caspian plain; the eastern and south-eastern upland rim; and the interior. Within this broad framework more local and sub-regional contrasts can be drawn; and whilst in a few instances precise demarcation between the major units is far from straightforward, for the most part the scheme adopted in the succeeding pages allows easy breakdown into units of distinct geographical significance.

THE ZAGROS REGION

As a single major physical region, the Zagros could be said to dominate the entire western portion of Iran, for it comprises some of the most imposing fold structure and clusters of high peaks to be found not only in Iran but within the whole of the Middle East. In terms of structure and

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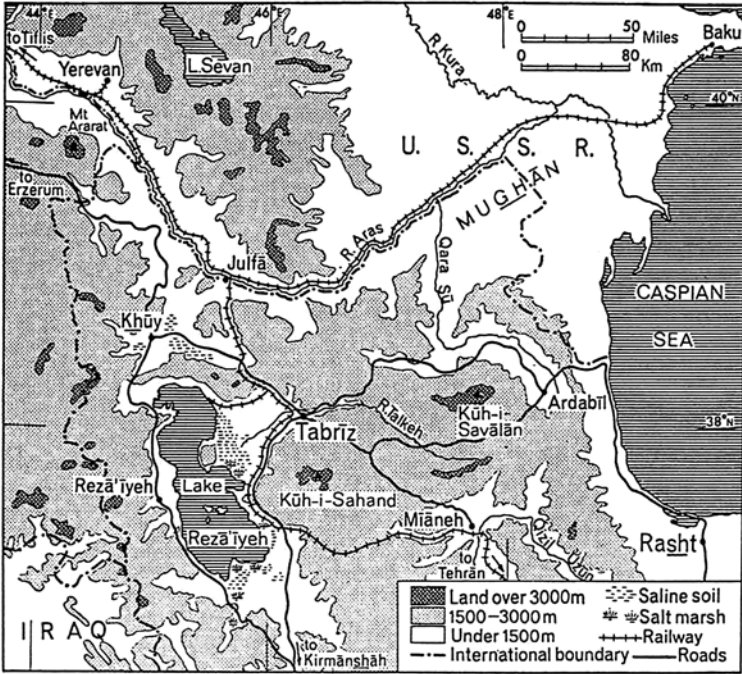


Fig. 4. The north-western Zagros.

hence topography it shows considerable variation, and two distinct sub-regions may be recognized: a north-western section extending from the Turkish-Russian frontier broadly as far as the zone Qazvin-Hamadān-Kirmānshāh; and the remainder, beginning at the latter line and extending as far as Bandar 'Abbās and Hurmuz on the Strait of Oman. The name "Zagros" tends to be restricted, in fact, to this latter portion; but in the writer's view the name could better apply to the upland as a whole, and a case could even be made for regarding the Zagros system as continuing through the Makrān towards the Pakistan frontier.

The north-west

The north-western Zagros may be described as roughly rectangular in disposition, and it consists of a series of massive structures, chiefly of Upper Cretaceous, Miocene, and Plio-Pleistocene geological age, which have been much disturbed—partly by folding on a relatively

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restricted scale, but more especially by fracturing followed by differential warping. A further effect resulting from fracturing and dislocation of the rock series has been the rise of magma on a considerable scale, so that much of the land surface is now formed by extruded igneous material.

The general topographical effect is consequently that of a series of irregular tablelands, which lie at an average altitude of 5,000 to 6,000 ft over much of the area; greater heights tending to occur in the extreme north and west, where average elevation could be said to be between 7,000 and 9,000 ft. The plateau surfaces also exhibit a general tilt that produces lower elevations mainly towards the south and east of this sub-region; and the overall effect of a "stair" topography is further emphasized by fault-scarps, which define a number of fault-valleys and downthrow basins. One such major fault-structure is the Aras valley, which consists of a sequence of rifts or fault-troughs that later became joined as a single valley by the effect of river erosion. Consequently the Aras valley has alternate open and narrow sections—a gorge just below Julfā, for instance, contrasting sharply with much flatter and broader stretches above and below.

Largest of the downthrow basins is that of the Rezā'iyyeh (Urūmiyyeh) system, from which there is no drainage outlet; and other basins of similar structure but smaller extent are the lowland around Khuy, the upper basin of the Qareh Sū river around Ardabil, and the associated tributary valley of the Ahar lying north-east of Tabriz.

Another element of much significance, and very often with striking topographical effects, is the superposition of large volcanic cones upon the high plateau surfaces. The best-developed but by no means the only examples produce the peaks of Savalan (14,000 ft), Sahand (12,138 ft) and Ararat (16,946 ft)—this last being just outside Persian territory. Dislocation and readjustment of the rock series in this area have by no means ceased, and the region is thus subject to a considerable number of earthquakes. Especially vulnerable is the city of Tabriz, where building styles minimize the effects of earth tremors: one, or only a few storeys, and light construction unless on a massive rock foundation.

This liability to earthquake devastation is characteristic of much of Iran, and of the north and west especially. Figure 5 shows the local effects of one major tremor that took place in 1964.

The final major influence in the evolution of landscape in the north-western Zagros has been erosion due to rivers. Because of its con-

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siderable altitude, rainfall is distinctly heavier over much of the plateau, with as much as 35 to 40 in. in parts of the extreme west; and the effect of this is augmented by the sharply seasonal onset, which concentrates the erosive effects into a short period. As a result, a number of deeply incised streams have cut considerable, often gorge-like valleys in less resistant strata. Effects due to heightened erosion are best exemplified in the north and west, towards the frontiers with Turkey and Iraq. Here the plateau is at its most developed, with maximum elevation produced by tilt; and the presence of numerous strong streams dropping rapidly towards the Iraqi lowlands gives rise to majestically contrasting scenery: enormous domes and jagged peaks, sombre defiles or dizzy gorges, and tenuous but well-defined valleys and flats, often grassy or wooded. Farther to the east and south, still within this northern zone of the Zagros, conditions take on more the character of an irregular, rolling plateau, broken by occasionally higher summits and a few deeper basins or river valleys. Certain of these valleys, especially towards Qazvin and Hamadān, are synclinal, i.e. the results of surface folding rather than of faulting and downthrow; and as we have already noted, crustal folding on a restricted scale is by no means entirely absent, even in the extreme north.

However, the predominant appearance of the north-western Zagros is one of tabular arrangement rather than intense folding: this differentiates the region strongly from its neighbour the central Zagros lying farther south-east. Routes within this sub-region must follow relatively tortuous valleys, or cross plateau surfaces at high altitudes and subsequently find a precarious way to lower levels across steep scarps.

Drainage in this area is complex. The tectonic trough of the Aras has a number of subsidiary downthrow basins opening off it, and in consequence there is a well-developed pattern of feeder tributaries flowing partly in relatively broad, flat-floored valleys, where the stream meanders or even splits into distributaries; and partly in constricted gorges, where the banks are close and the flow is swift. Equally important is the arctic (closed) system draining to Lake Reza'iyyeh. Of a total area of some 20,000 square miles, this drainage basin is defined on the east by the massifs culminating in Mt Sahand. Some thirty to forty miles west of the lake shore lies a series of major mountain crests that give rise to a watershed now adopted as the frontier with Iraq, and from this watershed the headwaters of the Great and

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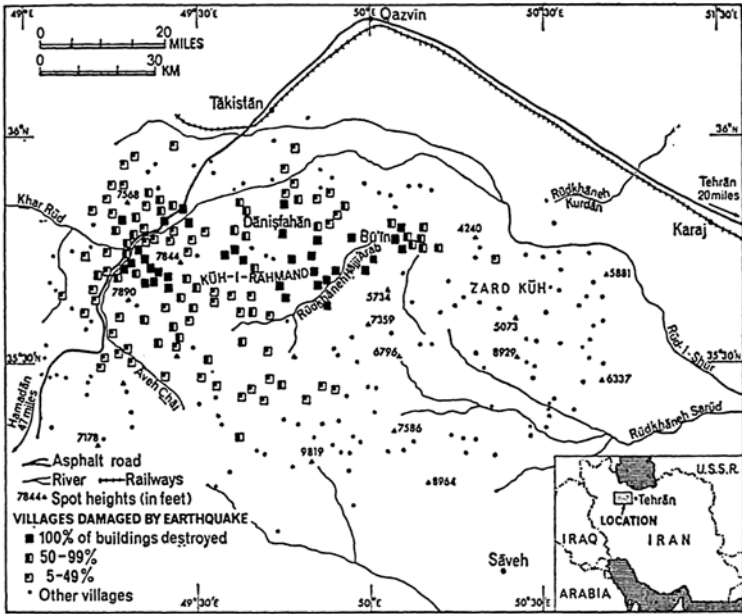


Fig. 3. Earthquake damage in March 1964. (After J. A. Brown.)

the Lesser Zāb plunge westward to join the main Tigris–Euphrates system. On the east, the Qizil Uzūn has cut backwards to produce an intricate, involuted drainage pattern that ultimately finds its way eastward to join the Safid Rūd in a breach through the Alburz system. In general, then, the north-western Zagros has a complex pattern of markedly radial drainage, with a large central basin—that of Lake Reza’iyeḥ—from which there is no outlet.

Lying in a depression produced mainly by tectonic action rather than by water erosion, Lake Reza’iyeḥ is a shallow sheet of water lying at 4,250 ft above sea level and measuring very approximately ninety miles by thirty. It is without steep retaining banks close to the present shore, and is consequently liable to much fluctuation in surface area. During the spring season, and following especially heavy winter rains, it can be as much as fifteen to twenty feet deep but it shrinks to as little as four to six feet in certain places after a pronounced dry period. The streams feeding it, particularly those from the east, have cut into layers of gypsum and other minerals. Much of the territory round Lake Reza’iyeḥ consists basically of limestone series, with extensive igneous