The Historical Occupancy and Economic Prospect of the Tarim Basin

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THE HISTORICAL OCCUPANCY AND ECONOMIC PROSPECT OF THE TARIM-BASIN.

Chapter I

Introduction

1. Regional nomenclature

This region, Tien Shan Nan Lu or the Tarim basin, the subject of my present survey, is popularly known as Chinese Turkestan or Eastern Turkestan. It has also been familiar to western writers, at various times, by many other names such as Kashgaria, Alteshar[1] or Six Cities, Kuchik Bukhara or little Bukhara,[2] High Tartary, Mongolhistan or Mongul Land,[3] Seven Kingdoms.[4] Historically, it was known as "Si-yueh" or "Western Regions" in Han dynasty (202 B. C. to 220 A. D.) and "Szechen" or "Four Garrisons" in Tang dynasty (618-907 A. D.). Since the latter part of the Nineteenth century, that is, after 1877, it, together

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1. That is, Kashgar, Yangihissar, Yarkand, Khotan, Aksu, and Kucha: see Journal of Central Asian Society, vol. 12, pt. 3, 1925, p. 226.
2. Thus called during the time of the Arab Conquest: see H. W. Bellew: Kashmir and Kashgar, p. A.
3. In the time of Chaghtay's rule of Yuan dynasty, ibid, p. A.
4. This name was not so well-known. It was given by the famous Roman Catholic, Benedict Goes, in 1616 when he passed through this region. See J. C. A. S., Proceedings, 1909, p. 5.

with its northern sister land, Dzungaria or Tien Shan Pei Lu (Northern route of Tien-shan), has been given the name of "Sinkiang" or "New Dominions".[5]

2. Location

This region, Tien Shan Nan Lu or the Tarim basin, which may be said to be the innermost heart of Asia, covers a wide area extending some nine hundred miles directly from West to East with its greatest width about three hundred and thirty miles from North to South.[6] It has generally been estimated to have an area of about 300,000 to 500,000 square miles. It lies between 36 to 43 degrees northern latitude and 73 to 92 degrees longitude East of Greenwich. The neighboring countries are: in the North and Northwest, Russian Turkestan; Northeast, Dzungaria; West, Afghanistan; South, Kashmir with Ladak and Tibet; and on the East, Kansu.

It is surrounded by several lofty mountain ranges, namely: in the North, the lordly "Tien Shan" or the "Celestial mountain"; in the West, the Pamirs; in the Southwest, the Karakoram; and in the South the Kuenlun chain. Only in the East we find that there is comparatively easy access

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5. In spelling names of places in so far as possible the orthography of Sir Aurel Stein has been followed.
6. Stein: On Ancient Central Asian Tracks, p. II. Others give its area as measuring about 1000 miles from East to West and about half that distance from North to South. See Sykes, P.: Through Desert and Oasis of Central Asia, p. 235.

to Karashar or Yenchi through the Yulduz Valley. Topographically, it is an undulating plain sloping gradually towards the East with the elevation at the West averaging 4000 feet. At Turfan, the country actually lies below sea level.

3. Explorations and previous studies made in this region listed.

Since its general physical qualities will be dealt with in detail later in Chapter II, they need not be discussed here. But one fact may be mentioned in passing: that this area, owing to its significant geographical position, has for many centuries served as the channel for interchange of early civilizations between China, India, and the Hellenized west Asia. It was also the meeting-place for the different trades and the center of various conquests in those days. Before the era of modern marine transportation, it was the sole connecting-link between the Orient and the Occident. It is in this region that we find one of the most fantastic and fascinating chapters in the cultural history of mankind.

Notwithstanding the significant historical position it occupied, as well as the important role it played in the early east-to-west trade, this region, Tien Shan Nan Lu or the Tarim basin, has for a long time remained one of the least known areas on the globe. Although it had

been traversed in the very early days by such well-known Chinese travellers as Fah Hsien about 400 A. D. and Hsuen-tsang in 629-644 A. D. as well as the famous western medieval traveller, Marco Polo, whereby some fragmental facts have been left to us, a systematic knowledge based on modern scientific surveys was lacking. It was not until the end of the past century that modern men of science, such as geographers, anthropologists, archeologists, as well as historians have turned their attention to this mysterious land. Since then, many explorations of this region have been made and numerous valuable works published. However, on the present occasion, it will not be feasible to mention all such studies but merely to enumerate the most important ones, as an introduction to the present paper.

If we disregard Marco Polo and Benedict Goes, who had traversed this region as early as in 1275 and 1604 respectively, Adolph Schlagintweit, a German, was the first modern European explorer venturing into this region.[7] He approached it from India in 1857. Immediately several Russians followed. Valikhanov in 1858, and Osten Sacken in 1867 crossed Tien Shan, thence descending from the North down to the Kashgarian plains. Later, in 1876,

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7. Elisee Reclus: Asia: The Earth and its inhabitants, edited by A. H. Keane, Vol. II, p. 59.

another famous Russian explorer, Kuroptkin, penetrated by the Terek-davan route into the Tarim basin, skirting the southern foot of Tienshan.

Meanwhile, Dr. A. Regal, a German botanist, in the service of Russia, explored Turfan in 1879. Later, Prjevalsky, another Russian explorer, travelled from Kuldja, crossed the Tienshan, to Lop Nor, and surveyed all the eastern section of the Tarim basin, between the Tienshan and the Altin-tagh, leaving us a great number of valuable maps of this region, which are still highly prized.[8]

The purchase in 1890 by Colonel Bowers, an Englishman, of the birch bark manuscript found by two natives at Kucha caused a great sensation among western scholars and aroused a deep interest in this region.[9]

However, the real credit for pioneering explorations, or for explorations that have been carried on in the strict scientific sense, should be given to Sven Hedin, who since 1894 has made a number of daring and successful journeys there and paved the way for all later expeditions.

In 1898, Dr. Klementz, of Russia, undertook a memorable journey into this region, mainly in Turfan. One

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8. Lattimore: High Tartary, p. 185.
9. Proceedings of the Asiatic Society of Bengal, November 1890.

year later, another Russian scholar, named Radloff, suggested in the Oriental Congress at Rome the formation of an international association for expeditions to Central and Eastern Asia.[10]

At about the same time, two French scholars, Gremard and Dutrevil de Rhines, undertook a great journey through this country, and left a number of valuable works.[11]

Dr. Aurel M. Stein, a well-known archeologist as well as a famous geographer, first attempted a systematic exploration of this region, mainly around Khotan, in 1900-01. About the same time, Sven Hedin visited the Northeastern portion of Lop Nor. Both of them were successful in their investigations and published many valuable books in that connection. To them, especially the former, we now owe most of our knowledge about this region.

The successes of both Stein and Hedin gave a new impetus to the German scholars. As a result, Professor A. Grünwedel and Dr. G. Huth were sent to this area, mainly in Turfan and Kucha, in 1902. In 1904, Le Coq, another German explorer, led the second expedition, mainly in the neighborhood of Hami and Turfan. In the third expedition

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10. N. P. Chakrvarti: India and Central Asia, p. 7.
11. Le Coq: Buried Treasures of Chinese Turkestan, p. 26.

of the same group, carried on between 1905-07, Kucha, Karashar, and Turfan were explored. It is interesting to note that at this juncture, in 1903, E. Huntington, an American geographer, under the auspices of the Carnegie Foundation, first visited this region.

In 1906, Stein revisited this region. During this expedition, which lasted for about two and a half years, he proceeded further to the East through Khotan and from there up to the northern extremity across the Taklamakan desert. Explorations of Khotan, Domoko, Niya, Loulan, and Miran were also made.

About the same time, between 1906-09, expeditions under the leadership of a famous French scholar, Paul Pelliot, were made into this district.[12]

In order to undertake more detailed explorations in the sites already visited, Dr. Stein led a third expedition in the summer of 1913. This time he made an almost complete reconnaissance of the whole region, even extending the scope of his exploration to the border of Kansu, as far as Tun-hwang and Suchow. About the same time Le Coq made his fourth expedition and explored regions near Kucha and Mirabalsh.

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12. Le Coq: Sand-buried Treasures of Chinese Turkestan, p. 26.

Concurrently, two Russian missions were sent there between 1906-08: one led by Bergowshy who explored Kucha in 1906-07, and the other by Kazaloff who covered the city of Khara-Khota, in 1908.

During the last decade, a number of explorations of this region were undertaken by Schomberg, Roerich, Emil Trinkler, Fillippi, Lattimore, Visser and many others. As a result, they published many valuable works.

So far I have tried to give a very brief listing of the most important explorations, which are partly archeological and partly geographical in nature, of Tien Shan Nan Lu or the Tarim basin, undertaken by western scholars including the French, Germans, Russians, Swedes, Americans, Englishmen, and other nationalities in the Occident. But we can not say that all the Orientals have remained idle in this respect. The first Japanese expedition into this region, through Kashgar, Khotan, Kucha, and Turfan, was undertaken under the leadership of Otami, in 1904. Later, a second Japanese expedition under Tachibana visited Turfan, Kucha, Lop-nor, and Khotan. As to the Chinese, it is regrettable to say that notwithstanding their position as the landlords of this region, and their marvellous contributions on the historical phase of the problem, they have remained totally inactive in scientific exploration. No single

systematic expedition has ever been made by the Chinese. It was not until 1929, when the first Sino-Swedish Central-Asian Expedition was organized under the leadership of Sven Hedin, that some of the Chinese scientists and scholars joined in exploring this area. At the time of writing, the expedition is still busy with its work in the field and no formal report has as yet been issued.

Before closing this section I should not fail to mention such famous names as Robert Shaw, Francis Young-husband, Macartney, Sykes, and Skrine, which are often connected with much of the famous literature concerning this region. Although they have not made any systematic expedition in the strictly scientific sense, nevertheless, we owe to them much of our present knowledge concerning this region.

4. Methods of Approach

Before taking up this topic, methods of approach to my present study, a few words may be said about the incentives which caused me to become so deeply interested in this region and to attempt the writing of the present paper. In the first place, my earnest desire to aid in developing the cultural potentialities inherent in Mohammedans of this region has led me to seek for more knowledge about the country where they live. Secondly, the rich and reliable resources

from the earliest Chinese records, together with an inclination toward the study of historical geography, suggest this region as a promising and fruitful field for such research. Again, the compilation of a bibliography of this region in 1932, revised in 1934, has made me familiar with the great variety of its literature and the most interesting unsolved problems connected therewith. In addition, my short visit to the region in the summer of 1933 not only confirmed my belief in the possibilities of research in this field, but also has acquainted me with the significant position which its exceptionally fertile soil and rich natural resources accord it in the future economic development of China. This greatly intensified my interest in studying this region.

My present approach is mainly historical and economic--with special emphasis on the study of the historical sequence of occupancy and the economic prospect for colonization. This is partly due to the materials available--since thanks to our early historical records we have the most reliable source about the historical evolution of the region--and partly due to the practicality of such an approach.

Notwithstanding the numerous expeditions made by so many scientists of different nationalities in the last

century, as summarized above, unfortunately we must say that, with only a few exceptions, most of them are too archeological in nature. For general purposes systematic and comprehensive accounts, especially of the general physical qualities of the area, such as its geologic formation, climate, soils, etc., are sadly lacking. Similarly it is regrettable to say that because of my short stay in the region and the absence of detailed observation, I cannot add very much in this connection. However, through my contact with the natives and my actual stay in the field, I did collect much valuable material which has not appeared in previous works.

Aside from the material I collected myself, the present work is based mainly upon the most authoritative sources that I have at my disposal. The present attempt is by no means an intensive study of any single feature, either physical or cultural, of the region. It is rather an extensive treatment of all its natural and cultural features such as physical qualities, historical evolution, peoples, economic prospects--including natural resources, agriculture, trade and trade routes, etc.--the problems now confronting this region, and the plans for general regional reconstruction. Problems in connection with the physical geography of this locality are specially mentioned.

In short, the scope of the present work is an attempt to synthesize and to systematize the geographic data concerning this region and to serve as an introduction to later intensive studies. Although the materials of the present work are largely secondary, it does represent a compilation from various sources of the most valuable materials available, and an attempted synopsis of their relationship in a geographic whole.

Moreover, in spite of the fact that volume after volume, unfortunately mostly travel notes and archeological reports, has been written about this region, a short, concise, comprehensive general treatment of the subject, as a whole, is still lacking. The present work is prepared to meet this demand. Although this paper appears to be incomplete and is not free from defects, yet it is to the author's best knowledge, the first attempt of its kind, either in English or in Chinese. I believe it will be of some help and use, at least in serving as a guide for those who want to become familiar with this very extensive but unknown region of the globe.

Finally, a few words about the bibliography and glossary are appended at the end of this paper; the bibliography is, of course, not exhaustive. As lack of knowledge of foreign languages other than English and

Turkish prevented me from listing many other valuable sources. But it is intended to be of value to the reader by indicating the variety of sources from which information may be drawn, as well as to show the range of work already accomplished. It furnishes an introduction to further research on the subject.

Regarding the glossary, Appendix II, it may be said that the students of this region have often been perplexed by the complicated nomenclature and change of geographical names which appeared in its literature. Geographical names in various languages such as Mongolian, Turkish, Persian, Chinese, Tibetan, and many other runic languages are found, and are spelled differently by different writers. This was largely due to the difficulty in transliterations from various languages such as from Turkish to Chinese or vice versa; from Chinese to Tibetan, English, or Persian; and Turkish to English, Persian, or Mongolian. Again, we are bewildered by the frequent change of geographical names such as names of towns or rivers, etc. in the early Chinese records. The identification of one name may be a matter of hours. In other cases, which are by no means uncommon, most of the local terms which appeared in the historical annals or other writings are not at present traceable at all. Consequently, their identification cannot be certain

and they must be left to conjecture. The present glossary, as appended, though short and incomplete, indicates long hours of painstaking work. I hope it may be of some help to those who want to become familiar with the local terms or names of this region. I hope it will be particularly useful to the Chinese readers who wish to consult modern western sources concerning this region.

Chapter II

Physical Qualities of the Region

1. Relief and Mountain Ranges:

A. The Pamir Range:

The mountain ranges bordering three sides of this region, on the North the Tien Shan ranges, on the West the Pamir peaks, and on the South the Kuen-lun chains including the Kara-koram range,--areamong the loftiest in the world. All of these mountains are covered with perpetual snow and most of their peaks exceed a height of 20,000 feet above sea level. The Pamir range, or "Tsun-ling", or the "Peaks of Onions" as the Chinese geographers called it, is known as the roof of the world, with the line of greatest elevation, Mustagh Ata, culminating in peaks rising to more than 25,000 feet.[1] This serves as the western rampart of the area. It joins Tien Shan on the North to the ice-clad Hindukush on the South and is the water-shed between the drainage areas of the Oxus and the Tarim Rivers. The Kashgar River, the upper stream of the Tarim, has its source from this region. This mighty range is not only important geographically, but even more so if considered

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1. Stein: On Ancient Central Asian Tracks, p. 7.

from the historical and cultural standpoint. It was through the plateau-like valleys of the Oxus of the Pamir that we find that the early trade, as well as cultural exchanges between China and the Tarim basin and the Oxus regions and thence India and the Occident, were carried on.

B. The Tien Shan Ranges

Northward rises another great rampart, the Tien Shan. This mountain range, "Tienshan" or "Celestial Mountains", is generally used in two senses. Broadly speaking, it denotes a mountain system extending from the Aral-Caspian depression (about 67° E) in the West to the great bend of the Hwang-ho in the East (about 103° E). But generally, this term is used in the narrow sense by Chinese geographers to refer to that part of the system which falls between the conspicuous mountain-knot of Khan-tengri (80° 11' E and 42° 15' N) and the Barkul depression in 92-93° E, where the northern range of the system abuts upon the Ek-tagh Altai.[2] It has also been known as "Pai Shan" or "White Mountains", "Shuh Shan" or "Snow Mountains", "Lin Shan" or "Celestial Mountains", etc. in the early Chinese writings.[3] It stretches

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2. Encyclopedia Brit., Vol. 22, 14th ed., p. 205.
3. Topographical records of Sinkiang, vol. 59, p. 3.

predominantly from West to East, from Pamir to Kia-yu-Kwan, and has a total distance of about 3,000 miles. It consists throughout of a series of parallel east-west ranges, each of which has its own local name. Varying considerably in height and width, in general, it is narrowest in the East and spreads out fan-like in the West. The highest peak is Khan-tengri, with a height of about 22,800 feet above sea-level (estimates regarding its height varied according to different writers). It is the source of many big rivers of this region, notably Aksu River in the South and Ili River in the North. In spite of its extraordinary height, it has from time immemorial been crossed at some half dozen or more points and has provided the regular route between the people of the southern slope and those from the north of Tien Shan. The most notable ones are: in the East, starting from Hami, a route passes through Otum-koza depression or Barkul depression, or by the gap at Urumchi, to cross the Dzungarian valley; in the central part, Muzart pass is regularly used as a route from Aksu in the South to the Tekes valley and Kuldja or Ili in the North; on the northwest, the shortest route between Kashgar and Ferghana and other parts of Western Turkestan is over the Terek pass.

C. The Kuen-lun Ranges:

The Kuen-lun on the South risees steeply from the flat deserts of the Takla-makan and Kum-tagh by successive terraces to the summit of the Tibetan Plateau. This range, in the wider application, is a succession of ranges which extend from the Pamirs on the West to 113° East. In the narrower sense it applies only to those ranges which separate the desert of Takla-makan on the North from the Tibetan plateau, on the South between the Pamirs and the transverse glen of the Kara-muren (about 85½° E). This mountain range, Kuen-lun, starting from the side of Pamirs, has its ranges buttressed by several parallel ranges, notably the Kara-koram range.[4] The latter range, Kara-koram, at an elevation of about 18,000 feet above sea-level serves as the only practicable line of communication between Yarkand and Ladak in India. Going eastward from the main Kuen-lun range, are found the sources of the two chief rivers of the Khotan oasis, Yurunkash and Kara-kash. Following eastward, the range sinks to a lower level and at the point of Charkhilik, a pass to Tibet is found. Finally, going to

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4. This name, Kara-korum, has been recently objected to by many central Asian geographers--a long discussion of the change of its present name has been suggested--see: Sidney Burrad: The Mountains of the Kara-koram: A defense of the existing nomenclature, Geographical Journal, vol. 84, No. 3, Sept. 1929, pp. 277-84; K. Mason: Nomenclature in the Karakoram, Geographical Journal, vol. 76, no. 2, Aug. 1934, pp. 143-58; Ph. C. Visser: The Mountains of Central Asia and their nomenclature, Geographical Journal, vol. 76, no. 2, pp. 138-42.

the eastern extremity of the Tarim basin, the Kuen-lun merges imperceptibly into the Nanshan.

2. Natural physiographic Divisions:

There are three main physiographic divisions in the area under survey: (1) the Taklamakan Desert in the central area; a trough between the mountain barriers enclosed by the river-systems of the Tarim; (2) the Oasis belt, South of Tienshan, East of the Pamir and North of Kara-koram and Kuen-lun; (3) the terminal depression of Lop-nor and Turfan. Sulo-ho basin--the cultivated area along the route North of Nanshan leading into Kansu may be added as another physiographic region, but a discussion of the latter is beyond the scope of the present survey.

A. The Taklamakan Desert:

a. Nature and sources of sand-storms

The Taklamakan desert is situated in the center of this region. It stretches for 500 miles from East to West, with the greatest width about 250 miles from North to South.[5] It is a region of bare drift sand and moving sand-dunes. It belongs to the category of clay and salt desert.[6] By using the Khotan river, which crosses through this desert,

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5. Sykes: Through deserts and oasis of Central Asia, p. 236.
6. Emil Trinkler: Geog. and archeological explorations in the Taklamakan desert of Chinese Tur., Journal of Central Asian Society, vol. 17, Jan. 1930, p. 5.

as a line of demarcation, Taklamakan desert has been divided into two parts by many geographers. The Western part of the Khotan river and the upper streams of the Tarim are called the Taklamakan desert while the part east of Khotan at the line of the lower Tarim and the Cherchen darya is known as the desert of Cherchen. The former is occupied almost entirely by sand-dunes; with sand hills ranging in hieght from 60 feet to as much as 300 feet. On the other hand, in the desert of Cherchen, the general size of the dunes is uniformly greater than that in the Taklamakan proper, passing 350 feet, and the configuration is complicated by the appearance of elongated expanses of level clay called bayirs.[7]

Devoid of water and lacking atmospheric moisture, the Taklamakan denies means of support to both animal and plant life. According to the reports of many geographers who actually traversed the center of this desert, only vegetation consisting of tomarisks, reeds, and poplars is found. The most terrific aspect of this region is the frequent occurrence of sand-storms. But these storms are as disastrous to the cultivated lands when sand is driven in dense

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7. Sven Hedin: Scientific Results of Central Asian Expedition, vol. I, pp. 360-365.

mass before the storm, as they are beneficial when they fall imperceptibly in the form of dust. Various theories have been advanced by modern geographers as to the origin of this sand. According to Sven Hedin, the masses of sand are derived from three separate sources: (1) the direct transportation by the wind of the products of disintegration from the adjacent mountains, whether sandstones or crystalline rocks; (2) through the activity of the wind operating on the arenaceous alluvia of the rivers and temporary lakes; (3) through the sand that was already present in the basin and which became exposed in more or less concentric beaches as the former sea dried up.[8] The "sand" in the desert as brought back by Stein from deserts near Khotan and several other places, and later examined by Prof. Loczy, a famous soil technician, proves that its constitution differs in no essential respect from that of the alluvial loess which forms the fertile soil of the oases. Like the latter it consists mainly of distinctly angular quartz-grains, plentifully mixed with mica-flakes and to a less extent with fine dust, all manifestly products of the detritus which forms through disintegration in the Kuen-lun mountains and which the rivers of Khotan wash down.[9]

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8. Sven Hedin, Scientific Results of Central Asian Expedition, vol. II, p. 448.
9. A. M. Stein: Ancient Khotan, vol. I, p. 127.

B. The Oasis Belt:

This area will be considered in greater detail in the later discussion of the water-supply and irrigation of this region, so in this connection its physical features will be but briefly mentioned. The oases, the only cultivable lands of this region, are situated on the margins of the desert and at the mouths of the mountain valleys. They are all fed by streams that flow down from the glaciers and the perpetual snowfields of the great encircling mountains. All life in these oases depends on the quantity of water which the rivers bring down. The total cultivated area of these oases, according to Dr. Albrecht Penck, who based his work on the maps surveyed by Stein in 1913-16, was about 5,000 square miles, of about one-sixtieth to one-seventieth of the total area.[10] These oases in the order of their succession from the South around to the North and East are: Cherchen, Khotan, Yarkand, Kashgar, Maralbash, Aksu, Uch-turfan, Kucha, Kurla, Kara-shar, Lop-nor, and Turfan. Each of them forms a circular patch of green vegetation and is separated from the other by a greater or less expanse of blank desert which is composed mainly of sand

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10. Geographical Journal, vol. 76, no. 6, Dec. 1930, p. 484.

and gravel. Thus, each is a more or less independent economic unit. The general shape of this oasis belt is somewhat like a horse-shoe with the toe pointing West.

C. The Terminal depressions of Lop-nor and the Turfan basin:

Lop-nor lies at the lower terminal of the Tarim basin. It is a huge marsh rather than a lake: a great salt-encrusted sea-bed, extending ~~in area~~ for fully 160 miles from south-west to northeast with a maximum width of some 90 miles.[11] This area is commonly alleged to be the remnant of an ancient salt sea.[12] Its constant shifting of bed and the mysterious hydrographical changes found there are some of the most controversial questions among geographers. I shall have an opportunity to return to this.

The Turfan basin:

The Turfan basin is enclosed on the North by part of the Tien Shan; on the West by an outlying range of the same system and on the East and South by the barren hills of the Kurug-tagh. One of the best descriptions of this particular region is given by Professor Huntington. It reads as follows:

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11. Stein: On Ancient Central Asian Tracks, p. 14.
12. El Reclus: The Earth and its inhabitants, p. 63.

"The basin floor extends scarcely 100 miles east and west by fifty north and south; the area is only about 2 per cent of that of its gigantic neighbor (the Lop or the Tarim basin). From the west shore of the evanescant terminal salt lake of Bojanti, in the bottom of the basin three hundred feet below sea-level, one can see at a glance all the features which, in the Lop basin can become familiar only after months of travel; the ring of encircling mountains; the concentric zones; the dwindling, withering rivers, flowing from terraced valleys out upon the plain towards the inconstant lake which most of them strive in vain to reach; the zone of piedmont gravel; the gently sloping plain of the basin floor covered in part with dry brown reeds and pale green camel thorn all dry, and in part a mere waste of naked clay or hard, white salt; the aggregation of huge, sombre sand dunes five or six hundred feet high--the villages set in dark patches of irrigated land; and the ruined towns and dead vegetation giving evidence of a former more abundant water supply."

D. The problem of the position of Lop-nor--a summary of the opinions of the competent geographers on this region

As to this problem of the shifting position of Lop-nor, a summary of the opinions of the most competent geographers on this region may be mentioned. Lop-nor, meaning in Turkish the lake of confluents of waters, is a terminal lake of the Tarim River. It is known in Chinese records in many other names such as, "Yu-tseh", "Lou-lan", "Pu-chang-hai", "Sin-su-hai", "Yien-tseh", and so on. It lies

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13. E. Huntington: The Pulse of Asia, pp. 295-96.

in the eastern end of the Tarim basin, with Astin-tagh in the South and Kurug-tagh in the North. Previous to 1876, this lake was placed at 42° 30' N in all maps based on the record of the Chinese. But, in that year, 1876, Przhevalsky, a famous Russian explorer, as a result of personal investigation discovered two closely connected lake-basins, Kara-buran and Kara-koschen fully one degree south, and he declared that the position of the lake had been wrongly assigned by the Chinese geographers. But his contention was strongly challenged by Von Richtofen, a famous German geographer and one of the most outstanding authorities on Asia. The arguments, adduced by the latter, may be briefly summarized as follows:

> "Prejevasky's lake was fresh, whereas Lop-nor has been called the Salt Lake, par excellence, in all ages; Shaw, Forsyth, and other authorities, report that the name Lop-nor was known in those regions, whereas Prejevalsky found no such name applied to his lake; ..... Another important argument is based on the bulk of water discharged by the Tarim at its mouth. Von Richtofen's theory presupposes that the Tarim River has altered its course, and that the main rush of water is now south-east instead of due east as formerly."
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Most important of all, the accuracy of the Chinese maps, strongly believed in by Richtofen, is strikingly proved

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14. Boulger, D. C., The Life of Yakub-beg, p. 304.

by the correct position given to the two lakes Khas-omo, which are identical with the Kara-koschen and Kara-burnr of Prjevalsky. However, Prjevalsky on the other hand, has published his refutation of what Richtofen has set forth[15] and insisted strongly that his observations were right.

In 1895, and later in several successful trips, Sven Hedin visited the spot and found that the Tarim River, instead of emptying its water in the lake of the Lop-nor, splits into a string of lakes, which are situated in 42° 30' N in exactly the same position as the old Chinese map assigned to them. So he concluded that the Lop-nor had changed its course, and the new Lake Karakoschen, discovered by Przevalsky, is not Lop-nor itself but a new lake of recent origin. This new lake, according to his calculation, based on information from a local chieftain, Kuchukan, had been formed no longer than 175 years ago.[16] But, nevertheless, he assures us that there is a close inter-relationship between the two lakes, the old Lop-nor, now rather a string of lakes, in the North and the new Kora-koschen in the South. The relation between the two is so close than when the Northern Lop-nor increases in size the Southern

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16. Sven Hedin: Through Asia, vol. II, p. 868.

Lop-nor decreases and vice versa. But everything points to a new pendulum-swing having begun back towards the North.[17]

At the same time, another Russian explorer, P. K. Kozoff, a student of Przhevalsky, revisited the region and insisted that the suggestions set forth by his teacher were true and rejected the findings of Sven Hedin.[18]

Since then many explorations had been made and numerous reports issued by geographers of that region but so far no consensus of opinion has been formed among them. Most recently, in the Sino-Swedish expedition, 1928-34, Sven Hedin appointed several members of his expedition to make careful surveys, but so far no definite and systematic reports have been issued. So, this whole question of Lop-nor is unsolved up to the present, and awaits further investigation.

For the general physiographic conditions of this region the reader is referred to the general map (Map I).

3. Soil: Its nature and formation

The soil of most of the oases consists of loess of distinctly riverine type, composed mainly of fine sand and silt carried down by the rivers from the disintegrated

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17. Hedin, Journal in Central Asia, Scientific Result, vol. II, p. 527.
18. Ibid., p. 869.

CHINESE TURKISTAN

SCALE

MILES 100 50 0 100

KILOMETERS 100 50 0 100 200

Elevations shown in meters

80° 85° 40° 85°

Sairam Nor
Ebi-Nor
Kuldja
Tekes
Kok-su
Aksu
Kucha
1100
Bai
Bugur
Karashahr
Ming-oi
Kara-chahr
Baghrash L.
Korla
Turfan
Karakoja
Yar-khoto
Urumchi
Guchen
Manass
Sinner
Yingpan Site
Ahmish-bulak
Kuruk-darya
Loulan Site
Inchike-darya
Tarim
R.
Khotan darya
Charchan-darya
Kash-shahr-arkhlik
salt encrusted seabed
Tawokkel
Dandanoilik
Kerya-darya
Niya Site
Endere
Charchan
960
Khotan
1369
Khadalik
Kerrya
Niya

LEGEND

Agricultural areas
Sandy with scrub
National boundary
Ancient Routes
Ancient sites
Dry river beds
Canal fields

U.C. 1935

slopes of mountains.[19] It consists chiefly of distinctly angular grains of quartz and mica flakes. Its formation is generally considered to be by sub-aerial deposition. Richtofen suggested that the formation of loess is a result of the long-continued drifting and deposit of fine dust by wind, that is, of aeolian action. The lighter alluvium having been carried away by the winds from the immediate vicinity of the river beds, was subsequently retained wherever the ground possessed sufficient moisture and vegetation. This, together with the gravels and sand, forms the basic element of its soil. By the continuation of this process from time immemorial, the mighty loess beds of the oases have been formed. Thus, as time goes on, there has been a steady accretion in the cultivable ground and a gradual increasing height of the loess bed of the oasis. This is partly due to the frequent occurrence of sand-storms whereby the sub-aerial deposits were increased from time to time, and partly due to the construction of irrigation channels in the oasis whereby the deposits of river silt have been greatly increased. The materials thus accummulated are originally the same river silts, whether deposited from

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19. Owing to the lack of systematic knowledge and survey of the geological structure of the region, only fragmental and incomplete statements can be made in this connection. See: Stein: Ancient Khotan, vol. I, section 5, pp. 122-8.

the water or from the atmosphere. Stein has reaffirmed this situation of gradually heightening of the soil-layer in the oasis by saying:

> "Everywhere in the oasis I noticed that the main roads were sunk consciderably below the surrounding level where they pass through land which has been long under cultivation; while elsewhere on waste land near newly tilled fields or within the villages, they kept flush with the adjoining ground."[20]

4. Climate:

A. General climatic conditions

In the absence of systematic observation[21] and reliable data, the present discussion of the climate of this region can be made only by basing it on the reports of authorities who have travelled there. Generally speaking, the climate is continental in nature, with hot summers and cold winters. The annual temperature range is very great; sometimes over 150 degrees F. As Professor Huntington observes, during his stay in the region from June 1905 to March 1906, the temperature range varied from minus 17°F to 90°F, although this does not represent an extreme case. In general, much of the Tarim basin has a temperature below the freezing point for at least three months. The months of December,

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20. A. M. Stein: Ancient Khotan, vol. I, p. 197.
21. Only in recent years, since 1928, attempts have been made by the Sino-Swedish expedition to establish metereological stations at Bogdonla, Charkheik, Keriya, Turfan, Shendi, and Urumchi, and Kucha, besides three mountain stations. See: Sven Hedin, Riddle of the Gobi Desert, p. 266 and p. 100. Unfortunately, the constant political unrest in the region has prevented the project from being carried into practice, and so far nothing has been accomplished.

January, and February are intensely cold, the temperature remaining below zero much of the time.[22]

On the basis of a recent collection of rather fragmental data from the natives, the temperature of this region may be generally tabulated as follows:

Locality	July Av.	Jan. Av.	Highest in July	Lowest in Jan.
Kashgar	80	22	90	17
Yarkand	82	21	103	2
Turfan	90	13	118	-5

In describing the general climatic conditions of Kashgar, Mr. Skrine has made this interesting remark:

> "...Owing to the extreme Continentality of the climate, Chinese Turkestan lies further from the sea than any country in the world--the annual range of temperature averages 100 F; the lowest readings in January being in the neighborhood of zero, while the highest shade temperature in August is 103 to 105 degrees F. Another climatic feature arising from continentality is the fact that April is much hotter than October, which is the warmer month in other regions of the globe."[23]

As to the atmospheric conditions, this district is very dry. It is generally agreed by many authorities on this region that the annual rainfall is not above 2 inches in the center of the basin, but may rise to 10-30 inches on

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22. Huntington: The Pulse of Asia, p. 95.
23. Skrine, Chinese Central Asia, 1920, p. 71.

marginal localities of higher altitudes. The evidence of unequal distribution of rainfall is clearly reflected by the conditions of vegetation as one descends from the plateau to the basin floor. At an elevation of from 10,000 to 14,000 feet good pastures are found, while at the height of from 5,000 to 10,000 feet sparse vegetation is seen and below that, from 5,000 to 3,000, there is almost complete absence of plant life in the main floor of the basin unless by the aid of irrigation.[24]

Nevertheless, conditions of rainfall vary from place to place in the same region. Schomberg, in his recent repeated travels and expeditions in this region, in 1929-33, has described the rainfall conditions of Kashgar by an excellent and accurate remark:

> "The average rainfall at Kashgar is 2 inches, and the influence of rain may be disregarded in discussing the climate of Southern Sinkiang. It is generally agreed that in recent centuries there has been no change in the rainfall. To show how dependent the whole country is on irrigation, it is interesting to note that not a single piece of unirrigated cultivation was seen anywhere south of Tien Shan, whether in the plain or in the hills."[25]

In Turfan, the conditions appear to be even worse, there sometimes being no precipitation at all for years,

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24. Huntington: Pulse of Asia, p. 94.
25. Schomberg, Geographical Journal, vol. 75, no. 4, April 1930, p. 316.

or as Dr. Le Coq has put it: "It only rains in Turfan at most once every ten years."[26]

But in Karashar or Yenchi, the eastern end of the basin, where the area adjoins the northern slope of Tien Shan, the precipitation is greater. This special area is much moister than that of the oases along the northern edge of the Tarim basin or to the South of the Taklamakan. The conditions are reflected by the presence of a great belt of vegetation excellently suited for winter grazing in this region and its adjacent areas.[27]

Aside from rainfall, slight snow falls occur usually two or three times during the winter.

Other significant climatic characteristics of this region worthy of mention are numerous high winds, frequent dust storms, and dusty hazy days. It has often been said that there have hardly been more than 100 clear days in a year.[28] Hsuan-tsang, one of the earliest Chinese travellers, has left us many interesting and vivid pictures describing such scenes.[29] Le Coq has described this situation of hazy days in Turfan vividly by saying that it was not until after the first six weeks of his stay there, that he saw for the first time the snow-covered mountains, because the whole

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26. Le Coq: Buried Treasures of Chinese Turkestan, p. 63.
27. Stein: Seridia, vol. III, p. 1179.
28. Sykes; Through Desert and Oases of Central Asia, p. 254.
29. Beal, Samuel: Si Yu Ki, p. 309.

time there had been a haze of dust which had veiled the mountain from his sight.

To many authorities on this region, this particular climatic situation, as characterized by great extremes of temperature, small amount of precipitation, and frequency of dust-storms with hazy days, may be generally attributed to two important factors: (1) first, owing to its unique geographical situation, it is in the center of the largest continent and its distance from the sea is great in every direction; (2) second, it is in the midst of a ring of lofty mountains which completely enclose it--the Himalaya and Kuen-lun in the South and the Northern Tien Shan in the North, and the Nanshan range to the East impede very considerably the moisture-laden breeze from the Indian Ocean, Siberia, and the Pacific Ocean respectively, and therefore limit its rainfall.

However, according to the recent survey of Dr. Haude, a German metereologist of the Sino-Swedish Expedition, this region is by no means completely cut off from the weather disturbances by the protecting wall of mountains but invasions of cold air from the northeast, probably through the Dzungaria gate of entrance, can take place, bringing rain and low lying clouds.[30]

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30. Hedin: Riddle of the Gobi Desert, p. 304.

B. Weather in regard to crop production

In contrast to countries where cultivation relies mainly on rainfall, agriculture of this region depends entirely upon irrigation works. Not only that but rainfall is often unwelcome. There has been a popular local proverb saying: "Wind will assure a good harvest while rainfall will bring a bad crop."[31] This is simply because during the time of planting in the spring, heavy rainfall will not only cause the soil to cake, thus preventing growth of the young plants, but also increases soil leaching and formation of alkali. On the other hand, if wind, mostly S. E. prevails in the spring, the weather is warm with abundant melting snow or glaciers, and water-supply assured, with good year crops resulting. Farmers of this region especially dread spring weather being cold for then the snow melts slowly and the water supply is reduced, causing a bad year for agriculture. But cases like the latter are, on the whole, infrequent.

Generally speaking, this region is free from such natural damages to cultivation as flood and drought. Hence in years free from such climatic drawbacks as cold spring, heavy rainfall, sand-storms, etc., agriculture can be practiced with certainty and good result. In most of the oases

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31. Topographical Records of Sinkiang, vol. 10, p. 3, and Hui-Chien Fen-Tu-Chi, Geog. Collections of Siao Wan Hu Series, vol. 2, p. 77.

there is but one crop a year. But, in Turfan, where the climate is so warm and the growing season extends more than nine months, two crops yearly are possible.

C. The problem of Desiccation

In connection with the climate of this region, a query commonly known as "The Problem of Desiccation" has often been raised and is still unsolved, that is, whether this region has been becoming more arid. Some of the well-known geographers such as Stein, Kuropatkin, E. Huntington, Sykes, and many others definitely stated that this was the case, while another group including scholars of equally famous reputation such as Richtofen, Sven Hedin, Schomberg, opposed it very strongly. The arguments brought up for the affirmative may be briefly summarized as follows: (1) the drying-up of Lop-Nor; (2) the disappearance of the Keriya River; (3) the general changes in riverine condition in the south-east; (4) the evidence of dead forests, dead reeds, ruined cities and abandoned towns, and derelict cultivation.

But in his recent survey, Schomberg suggested that the climate of this region has remained unchanged and that the difference in aridity and the drying of water-beds, and other conditions mentioned above, were mainly due to the variation of the volumes of the streams and the shift of their courses.[32] Some rivers have more water and others

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32. See: Geographical Journal, vol. 75, April 1930, p. 317.

have less, instead of the uniform or general decrease of volume in all the rivers as advocated by the pro-desiccationists. Most of his arguments seem to be quite convincing, but many refutations can also be advanced and many questions can be asked. For instance, how can the variations in volumes of the streams be explained if the climatic conditions of the region remain the same? This can only be accounted for in variation of the amount of precipitation on the snow-fields feeding the glaciers or in variations of solar heat melting the ice which supplies water for the rivers. Such variations would indicate a change of climate. Again, how can the rivers change their courses, if they do not vary in volume? These are interesting questions to which we have no satisfactory answers, as yet.

This controversial problem of "desiccation" can only be solved by further pain staking research. Dr. Emil Trinkler, in discussing this problem, has given us the most impartial and excellent summary from which may be quoted briefly:

> "Much has been written on the subject of the desiccation of Central Asia. There can be no doubt that some 2000 years ago several of the rivers coming down from the high mountains fringing the Tarim basin penetrated farther into the desert. The Niya river was about 70 miles longer and the Keriya, which is now gradually drying up in the sands, very probably at one time reached the Tarim basin. What was the cause of the decrease in the volume of water which used to flow in these rivers. The best answer to give is we do not know yet. It will only be possible, with very exact observations covering long periods of time, for us in the future to state whether there has

been any substantial decrease in the rainfall or in the size of glaciers."
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5. Water supply and Irrigation Systems.

A. River systems and their general characteristics

Before taking up the problem of Water supply and Irrigation systems of this region, a brief survey of its river systems is essential. Generally speaking, there are three distinct river systems: (1) the Tarim and its tributaries--which provide the bulk of the water and drain the area from Qurghaliq to Kurla; (2) the Cherchen system in the south-east; (3) the Konchu daira which rises from the Bograshkol in the Yulduz Valley.

(a) The Tarim system

The Tarim, a Turki term literally meaning "cultivable", is a name given to the aggregate of rivers that fall into the main stream of the area. It has a total length of about 1000 miles from its original source (Pamir or Trans-alai and the Terlek devan; for a complete account of this, see: Geographical Journal, vol. 80, no. 2, August 1932, p. 144) to the terminal basin, Lop-nor or Karakoschen. In its upper streams, there are four main tributaries, namely: Kashgar or Kizil Su, flowing down from the eternal snows of the Trans-alai Terek-devan; Yarkand or the Rastram

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33. Emil Trinkler: The storm swept Roof of Asia, p. 245.

daira, of the eastern "pamirs" or the east of the Hindukush and north-western Tibet,[34] Shinshal Pass, Kara-korum; Aksu-daira, with its sources in Tieh-leh-keh-lin (Peak) and Ah-Teh-Boh-Shih mountain, from the North; and in the South, the Khotan river, a confluence of two big streams Yurung-hash and Kara-kosh, having their source in the Kuen-lun traversing the Taklamakan Desert from end to end. From the confluence of the Kashgar and Yarkand rivers, the Khotan flows about 230 miles northward, and then is joined by the Aksu-daira, a very swift and powerful stream from the North. From the point of junction, the united stream henceforward assumes the name "Tarim" and preserves the dominant direction of the Aksu-daria,[35] that is, toward east-north-east. About 20 miles further, it is joined by Khotan-daira from the South. Flowing for another 150 miles eastward the Tarim comes into direct conflict with the sand dunes of the desert and begins to lose volume in lagoons, lateral lakes and bogs. Further eastward it is joined by Konchu-daira from the North and Cherchen daira from the South until it finally emerges into the terminal basin, Lop-nor or Kara-Koschen.

Among all the affluents of the upper Tarim, although the Yarkand daira is the longest stream, the main artery of the Tarim system, the Aksu-daira is the most powerful

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34. Hedin: Through Asia, vol. II, pp. 869-70.
35. Hedin: Scientific results of Central Asian Expeditions, vol. I, p. 76.

stream and one with the biggest volume. It is the latter which contributes greater volume to the Tarim and helps it to flow successfully through such a long course in spite of losses to many lagoons, lakes, and irrigation channels, and in spite of the excessively high rate of evaporation caused by the dry climate.[36] On the other hand, Khotan daira only flows into the Tarim during forty days throughout the year and dies away during the winter into a narrow icebound ribbon.[37] In the case of the Kashgar river, the water supply has also remained rather weak and of minor importance, especially in the winter season.

(b) Cher-chen-daira-system

The Cherchen darira, known as Chuh-mo-ho in Chinese records, has its source in Kun-shi-keh-tu-lo-fum mountain of Hu U-lu-keh-su range and carries a portion of the rainfall of Northern Tibet. Although it has contributed its part to the flow of the Tarim, it is, on the whole, a distinct river system in itself. It has a basin of its own, a definite course, and an interesting end in Lop-nor. It is a fine stream with a big, regular flow. Even in early spring, the stream was found with an abundance of water and had suffered no decrease in supply, as observed by Schomberg

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36. Hedin, Scientific Results of Central Asian Expedition, vols. I and vol. II, pp. 78, p. 517.
37. Ibid., vol. I, p. 79.

in 1931.[38] Therefore, it has often been said that the catchment area of this stream has a fairly high potentiality for cultivable purposes East of Khotan in the Tarim basin.

(c) Konchu-daira:

Although flowing into the Tarim and exercising a profound influence on the drainage of this basin, the Konchu daira forms a separate river system. It rises from the Bogrash-kol, the largest lake in Central Asia, after flowing and North of Tikenlik it drains into a marsh called Maltak-koll.[39] It connects with the Tarim from the South and flows downward with the main stream.

In addition, there are many rivers of minor significance such as Keriya River, Niya River, Andere river, etc.--all of them perished in the desert--in the southern edge of the basin along Kuen-lun range, and Inchika, Haldus River, etc. at the northern edge along the southern slope of Tien Shan. For a detailed picture of these rivers the reader is referred to the maps showing the catchment areas of different systems. (Map II).

Although the total area actually utilized for cultivation purposes in the Tarim basin itself has been very small the total catchment area of all the river system in this region is great. It was estimated by Sven Hedin that this

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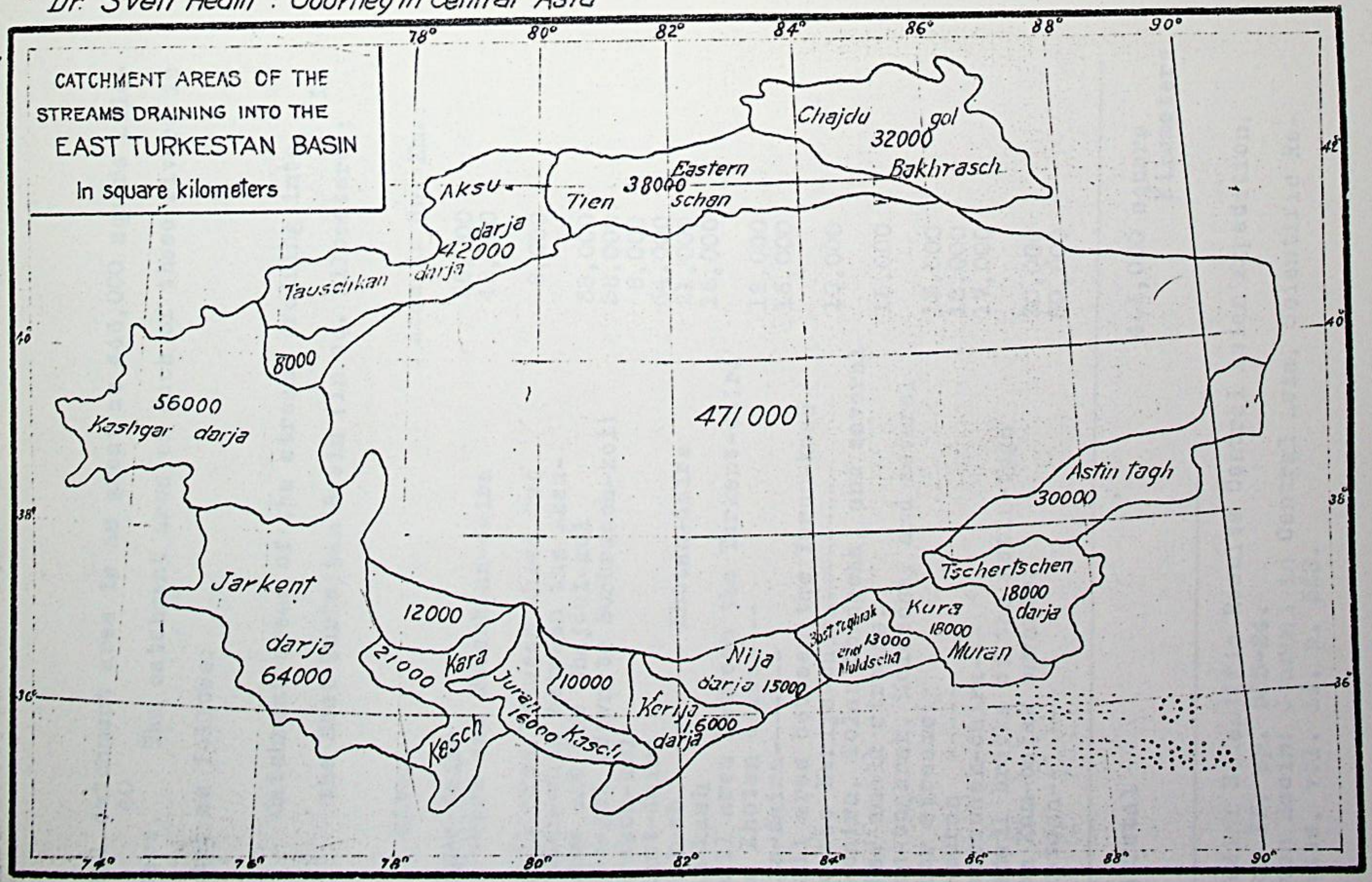
38. Geographical Journal, vol. 80, no. 2, p. 137, Aug. 1932.
39. Hedin, Through Asia, vol. II, p. 854.


CATCHMENT AREAS OF THE
STREAMS DRAINING INTO THE
EAST TURKESTAN BASIN
In square kilometers
78°
80°
82°
84°
86°
88°
90°
42°
40°
38°
36°
Chajdu gol
32000
Bakhrasch
Eastern
Tien schan
38000
Aksu darja
42000
Tauschkan darja
8000
56000
Kashgar darja
471 000
Astin tagh
30000
Tschertschen
18000
darja
Kura
18000
Muran
Jarkent
darja
64000
12000
21000
Kara
Jurai
16000
Kasch
10000
Kesch
Nija
darja 15000
Kerija
16000
darja
Ost Tighrak
and
Muldscha
13000
Tighrak
Muldscha
Kara
Muran
Kerija
darja
Nija
darja
Kesch
Kara
Jurai
Kasch
Jarkent
darja
Kashgar darja
Tauschkan darja
Aksu darja
Tien schan
Eastern
Chajdu gol
Bakhrasch
Astin tagh
Tschertschen
Kura
Muran
Ost Tighrak
and
Muldscha
Tighrak
Muldscha

total catchment area is as great as 446,000 square kilometers.[40] The catchment area of each of these rivers is listed as follows:

Catchment areas of the streams draining into the East Turkestan Basin (in sq. kilometers):[41]

River	Area in Sq. Km.:
Kashgar-daira	56,000
Aksu-daira and Tauschkan-daira	42,000
A small area between these two	8,000
The Tien-shan between the Aksu-daira and the Chajdul-kol	38,000
Chajdu-gol (down to Borhrasch-kol)	52,000
Borhrasch-kol	8,000
Jarkent-daira	64,000
Kara-kash ------- Khotan-daira	21,000
Yurun-kash	16,000
A small area between the Yarkent-daira and Khotan daira----	12,000
Keriya-daira-------	16,000
A small area between the Yurun-kash and the Keriya-daira---------	10,000
Niya-daira, Tolan Chodscha, and several other small streams:	15,000
Bostan-toghrak, Moldscha, and several minor streams:	13,000
Kara-muran -----	18,000
Tschertschen-daira---	17,000
The small brooks of the Astin-tagh from Kum-bulak onwards:	30,000
Kuruk-tagh-- -----	30,000
Grand Total	446,000 square Kilometers

40. Hedin: Scientific Results Central Asian Expedition, vol II, pp. 523-24.
41. Sven Hedin: Journal in Central Asia, Scientific Results, vol. II, p. 523.

(d) Summary of the special characteristics of the rivers of this region:

Before bringing this section to a close, a brief summary of the peculiar characteristics of the rivers of this region may be advisable because this will help understanding of the later discussion on the conditions of its water supply and irrigation systems. In the first place, on account of the scarcity of precipitation, nearly all the streams are exclusively fed by the melting snows or glaciers from the encircling mountains, that is, their major discharge is in summer. Secondly, the flow of nearly all the main streams has an eastward direction. Again, throughout their course, because of the formation of lagoons, back-waters, marshes, swamps, the drawing of water for irrigation purposes and the extremely high rate of evaporation, these streams lose volume steadily as they travel eastward. Especially is this true of the Tarim. The further it flows to the East the deeper and narrower it grows, with its banks becoming more and more desolate, till at last not a vestige of vegetation is to be seen.[42] Thirdly, another interesting characteristic of all these streams is that they are very sluggish in nature and with a very high degree of meandering. Their waters are not confined to one channel. Their courses are very

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42. Hedin: Through Asia, vol. II, p. 886.

sinuous and they often divide and reunite. As Mr. Schomberg has vividly described it:

> "The plain of Turkestan consists of a friable soil and there is thus nothing to control or guide the rivers as they roll down into the plains. When they reach this level yielding plain, there is no hill, no rock formation, no unmovable forest, to curb their will; unrestrained and unchecked they wander aimlessly through this monotonous region."[43]

The natives also have this saying: "The rivers are kings, no one can prevent or block them." Moreover, because of the soft, friable, and loose soil, through the formation of backwaters, lagoons, and underground passage ways, the water sometimes disappears in one place and reappears below. This makes any scientific survey or accurate observation very difficult, or almost impossible. As Schomberg points out, even an aeroplane would be useless, as the depth of the various sheets of water, the identification of the true water, and its separation from some vagrant tributary, could never be detected. And, again, it makes the application of modern engineering methods for the irrigation works in this region very difficult.

Besides, the constant shift and change of riverbeds in the Tarim system has remained an unsolved puzzle to the geographers of that region. It has been generally

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43. Geographical Journal, vol. 75, no. 4, April 1930, p. 316.

agreed by authorities that the lower Tarim has periodically changed its course and swung between North and South like a pendulum.[44] Sven Hedin, after having spent a long time between 1899-1902 in mapping the course of this complicated Tarim river system, devoting two big volumes to it, has given us the best and most explicit summary concerning it. He says:

> "In skeleton outline the plan of the Tarim system resembles a drooping birch-- The Kara-koschen is the root of the tree, the Tarim its trunk, and the various tributaries its branches, while the catchment-areas of these last would pass for the clusters of foliage. The Keriya-daira, the rivers of Kirk-saji, and several others are branches withered and cut off. The functional activity of the river-systems work however in a direction opposite to what it does in the tree. For whereas in the latter growth proceeds from the root upwards, and the 'sap' rises through the trunk, and penetrates thence into the branches and leaves, in the river systems the 'sap' gathers first in the remotest tentacles, and flows down-wards through the branches and the trunk, so that it is through its peripheral activity that the terminal lake is maintained--. The shape of the basin of East Turkestan forces the rivers to flow together, and so to become affluents of each other mutually."[45]

B. Irrigation works and their problems

a. General conditions

As precipitation has played a very insignificant part in this region, water-supply depends mainly on the

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44. Hedin, Riddle of the Gobi Desert, p. 254.
45. Sven Hedin, Scientific Results of Central Asian Expedition, 1899-1902, vol. II, p. 528.

melting snow and glaciers of the mountains and agricultural cultivation can only be carried on with the aid of irrigation. Probably in very few places in the world have irrigation systems affected the life of the people so greatly as they have in this region. It may be said that "no irrigation, no cultivation, no life," has been the ironical law of the past and will remain so forever.

As I have already pointed out, the total areas of the oases actually cultivated in this region have been very small, amounting to about 5,000 square miles or 1½ per cent of the total area.[46] These oases, being mostly in lower altitudes in the foot-hills near the edge of the desert, and consisting, as a rule, of pretty fertile soil, are, in general, situated at the very debouchure of the rivers where they spread in fans over the broad basin. Through these alluvial fans, which are formed by the rivers at the foot of these mountains from whence they flow irrigation works were made. Here the rivers can be easily divided into the branches necessary for irrigation, or their water trickles down into the loose soil of the fan and reappears farther down in most places which allow cultivation. The rivers wind their way in great curves through these districts and thus numberless irrigation channels have been made.

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46. Sykes, Through deserts and Oasis of Central Asia, p. 237.

Some of these oases have their cultivated or irrigated areas carried to a very limited range with the supply of water from the rivers which are called by Stein "terminal oases", while in many other cases the water-supply carries far beyond these irrigated areas. Of the latter category, oases like Kashgar, Yangi-hissar, Yarkand, Karkholik, Khotan, Keriya, Aksu, and a number of other important ones may be mentioned. But the oases on the main route between Karkholik and Khotan and others further East along the edge of Taklamakan, such as Yartunguz, Endere, Domoko, Gulakhma, visited by Stein in 1900-01, represent the first type, that is, the "terminal oasis".[47] They all practically mark the extreme point reached by the streams which bring them fertility.

b. The Karez system in Turfan

In Turfan, there is a special system of irrigation, known as the Karez (a Persian name) system, called Kan-Chien by the Chinese. This is a kind of under-ground or subterranean system of canals used to guide the mountain springs into the plain. It catches the sub-soil water beneath the gravel slopes and carries it over considerable distances. Professor Le Coq, after his long stay in Turfan and careful observation of the actual scheme of operation, writes:

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47. See: Stein: Ancient Khotan, vol. I, Chaps. 9, 11, 12, and 13.

"These water courses, called 'kariz', are made as follows: After the exact position of the spring is fixed a large number of shafts, often very deep, are sunk in a long, straight line on the rising ground. When they are finished they are joined to one another by tunnels, the spring is directed into the topmost hole, flows through the tunnel, and since this slopes less steeply than the rising land, the water issues at the desired spot in the plain. All this difficult work is carried out by the people without any scientific help."

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The development of this karez system in the Turfan area is of comparatively recent origin. It has been commonly attributed to General Lin Tseh-tsu, who was exiled to Sinkiang in the latter part of the nineteenth century. According to Stein, the origin of this system cannot be traced further back than the eighteenth century.

49

The most important advantage of this system is to protect the water of the irrigation from evaporation after carrying a long distance. But the defect is that the expense of its construction is very high. Generally, it took twenty to thirty thousand dollars to build a Karez, too large a sum for the natives to pay. Thus only in places of exceptionally fertile soil and capable of producing the most profitable crops, for instance, such as in Turfan, where owing to the warm climate and long growing season, two crops yearly are possible, can such a system be profitably established.

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48. Le Coq: Buried Treasures of Chinese Turkestan, p. 53.
49. Stein: Memoirs on Maps of Chinese Turkestan and Kansu, p. 48.

c. Problems of erosion

Notwithstanding the advantages these irrigation channels give to this region, making cultivation possible, they are not at all free from defects. Neither can they be depended upon wholly. On account of the peculiar loose and friable character of the soil and the frequent sand-storms and high winds, soil erosion is serious and wide-spread. It has caused a great number of acres of land, once irrigated and cultivated, to be abandoned. Soil erosion has happened in many ways. First, when a river has burrowed a bed for itself or an irrigation channel is made therefrom, the tendency is for the walls of the sand to fall into the trough. As a result, the irrigation channels become unusable and land once irrigated becomes deserted. Or, in other cases, soil erosion is caused by the sinking of the water level of irrigation channels. As Schomberg has vividly pictured:

> "A river carves its way in the desert soft soil, and the water at first is near the surface. The cultivator comes and starts to irrigate; but gradually the water eats into the soil, the level falls, the fields become unirrigable, and the peasant deports elsewhere, leaving his fields behind him." 50

Besides, many cultivable lands are often found to be deserted because the soil became salty and infertile. In such cases new irrigation channels can only be introduced at high levels. These new channels will consume the water

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50. Schomberg: Geographical Journal, vol. 75, no. 3, March 1930, p. 318.

which was formerly used in the same oases.

Above all, owing to the uniformity of level of the sand desert and the loose characteristics of the soil, the river or irrigation channels tend to spread themselves into numerous side-channels and lagoons and artificial control becomes very difficult. Thus a large amount of water is lost either through this formation of sub-soil water or the extension of evaporation surface. It cannot be recovered for irrigation purposes. This is really one of the most serious problems confronting this region. Its successful solution waits competent help from modern engineering science.

d. Number of irrigation channels and their geographical distributions.

No actual investigation has ever been made regarding the total number of irrigation channels and total mows (about 1/6 of an acre) of land irrigated. According to the report of the Topographical Records of Sinkiang, published in 1910, the total number of main channels is 944 and the branch channels 2,333, and the total number of mows of land irrigated is 11,190,621.[51] The detailed conditions of their geographical distributions may be tabulated as follows:

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51. Topographical Records of Sinkiang, vol. 23-24.

Table showing total number of irrigation channels, total number of mows irrigated, and their Geographical distributions:

Name of district	Total no. of main channels:	Total no. of branch channels:	Total no. of mows irrigated
1. Tieh-hwa (Urumchi)	44	66	186,637
2. Chang-chi	13	96	96,674
3. Hu-Tu-pih	38	64	53,800
4. Chi-tai	20	30	316,280
5. Fu-kan	6	24	51,759
6. Shui-lai	51	163	109,748
7. Fuh-yuan	7	21	121,039
8. Turfan	34	23	82,149
9. Shan Shan	46	21	75,159
10. Chen-hsi	34	24	41,175
11. Hami	21	23	19,210
12. Kur-Kara-Wu-su	17	34	11,405
13. Ta-cheng	15	10	43,807
14. Ching-ho	7	9	4,227
15. Shui-ting	15	28	29,140
16. Nin-yuan	13	7	645,550
17. Kara-shar	30	7	167,805
18. Sin-ping	18	1	19,564
19. Lun-tai	7	17	165,700
20. Sha-yar	30	53	303,747
21. Kucha	40	108	654,476
22. Bai-chen	12	14	445,577
23. Wen-suh	17	123	919,475
24. Wu-shih	36	117	572,793
25. Ko-ping	3	14	28,146
26. Charkhilik	7	10	18,113
27. Yu-tien	39	43	636,133
28. Lo-puh	8	47	293,744
29. Khotan	32	132	662,334
30. Ba-chuh	26	121	202,728
31. Pi-shan	38	19	360,891
32. Yieh-chen	33	143	844,106
33. Yarkand	19	184	102,150
34. Kai-shih	68	58	366,889
35. Yangi-shar	9	61	480,014
36. Kashgar	34	206	555,448
37. Su-fuh	46	161	590,454
38. Sariqol	11	51	1,925
Grand Total	944	2,333	11,190,621

e. Irrigation channels and the administrative systems

It is interesting to note that since irrigation has been the mainstay of the whole economic organization of this region, it has exerted a great influence on its general scheme of administration. Nearly all the administrative divisions of these oases conform to the arrangement of the main canals. For purposes of revenue and general administration the oases are divided into a series of long cantons representing the areas irrigated by each of the main canals. In each canton there is an official called "sung nung bagi", meaning the "king of the water", by the natives, to take charge of the irrigation offices. He is elected by the people and reappointed by the district magistrate. His duties are to look after the sources of the water, to fix the time for opening and closing of the dams, to regulate the amount of water to be used by each farm, and so on. Most important of all, in case of the frequent disputes arising concerning the struggle for water, he acts as the arbitrator.

f. Summary

To sum up, I wish to say that there are very few places in the world where people depend so completely upon irrigation as do the inhabitants of this region. With the gradual increase of population, slow as it is, irrigation works will become increasingly important. In spite of the most primitive methods now used for all the irrigation

works, and a total lack of modern scientific guidance, a considerable and increasing number of acres of land are being reclaimed for cultivation purposes. For instance, the lines of cultivation between Marabalshi and Yarkand are now almost continuous although they were represented mainly as waste lands in the map of Stein when he first visited

the area twenty years ago. But, with an energetic and far-sighted government, together with the help of modern science, more irrigation works could be initiated and more waste lands reclaimed. This will certainly bring its inhabitants greater prosperity.

6. Vegetation and Fauna

A. General conditions of natural vegetation

As to its natural vegetation, this region, the Tarim basin, is typified by a number of interesting plants such as tamarisk jungles, reeds, toghraks, or poplars, "chi-chi-tsao" (grass), etc. It is found that the tamarisk jungles spread over large stretches of land, especially in the desert and at the edge or between the oases. As there are no rains and practically no irrigation channels whatsoever, these plants owe their very existence to the sub-soil water percolating from the distant rivers or irrigation channels of the near oases. With these plants grow many reeds, some reaching 12 feet in height. These reeds are sometimes used for grazing. The native farmers have a

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52. Geographical Journal, vol. 75, no. 4, April 1930.

practice of burning these reeds once a year with a belief that they will secure good pastures in the year following. Again, there is another wild plant at the edge of the oases and also in the desert, called "chi-chi-tsao" or "Chi-chi-grass", by the Chinese. These are about four feet high, with wide leaves, and strong fibers. Only its fibers are recovered by the natives for making baskets, chairs, and other implements, which are said to be very durable. Above all, the poplar, (P. Euphratica), called toghrak by the natives, a short thick-set tree, with fluted bark and small pointed leaves, forms another very characteristic tree growing freely everywhere in the oases and in the desert as well. In the oases they grow to much bigger size and taller height. These trees are said to be extremely drought-resistant. They, together with the beautiful elm trees growing in spherical form, are used for shade in the oases. Besides, willows, a kind of weeping willow, called by the Chinese "Tsuia Liu", is also widely planted in the oases, especially in fringeing the fields of cereal crops, along the doorways and roads. Such a scene has never been seen anywhere in the farms of Inner China.

In Kashgar and its adjacent areas, a harmful plant, with a very strong odor, a kind of hemp, known as hashish (cannabis indica) is found. This plant is a very strong stimulant and has worse effects upon its victims than opium. A stimulant drug is prepared from the pollen which falls from the flowers upon the leaves. Many people have

formed the habit of using it as a stimulant and have impaired their health very greatly by doing so. Much has been exported to India and forms one of the most important items of Sinkiang-India trade. The Chinese officials have tried in vain to forbid the people to plant it.

B. Conditions of animal life and fishing.

Of domestic animals the following are bred in this region: horse, sheep, horned cattle, donkeys, camels, goats, and mules. They are used both for construction and transportation purposes. Horses of Karashar are of excellent breed and especially famous. Fur-bearing animals such as fox, squirrel, bears, wolves, are abundant. Hides of all kinds are produced--lamb-skin known as "kao-pu" is of especially high value. Horns from the antelopes are also sold at very high prices. Other wild animals, like tiger in the Maralbashi jungles, wild hogs of the reed belts bordering the rivers, wild yak of the mountain ranges, wild camels of the Lop-nor, the gazelle of the desert are popularly known in the country and were very good agents for sports. Similarly, other things like the pheasant, partridge, hare, and a special variety of pheasant, Hsuch-Chi, or snow-pheasant, are found in TienShan, all forming an interesting part of the natural fauna of this region. Besides, fishes of different varieties are found in both Karashar and Lop-nor. People in the latter region especially depend almost entirely on fish for their diet. They have become so

accustomed to fish, that it is claimed by them and others that their digestions are upset if they shift to cereal foods.[53]

Generally speaking, grazing has never been practiced in the oases. Animals are allowed on the fields in the oases only after the crops have been gathered. Natural pasture in the oases is almost completely lacking. Animals are fed mostly with lucerne, clover, and the green millet in the fields or at the stables. But, sometimes in the mountain slopes and in the wooded tracts along the courses of the rivers near the oases, small-scale grazing, mostly for cattle and horse breeding, is found. The most commonly found animals on every farm are cattle, ponies, donkeys, and sheep. Especially the ponies have been used extensively by the farmers for riding, for packing (both loading on the back of the animal and also drawing the carts) and many other purposes. They have formed one of the most efficient means of transportation or travelling, besides camels, between the oases. Again, especially the "Komiss", the horse milk, has been one of the most important delicacies in this region, particularly in Karashar. In many oases of this area horses largely replace cattle in their rural economy; cattle are used for ploughing and heavy hauling, donkeys for riding and light-loads, and sheep as the chief supply of meat.

In short, although this country is mainly agricultural in nature, yet its natural fauna does form a considerable part

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53. Topographical Records of Sinkiang, vol. 24, p. 5.

of its natural wealth especially among those Khirhiz who are residing in the north-western mountain sections of this country.

7. Conclusions:

A. Geography as a determining factor of the region's history

Before closing this chapter on the physical qualities of this region several outstanding facts should be mentioned to show how strong an effect they have exerted on the whole destiny of this region. They not only dominate its historical past but also its cultural landscape at the present time. To return to the first point, it is known that for thousands of years past, this region has been repeatedly invaded, conquered, and reconquered by many nomadic tribes, such as Huns, Tibetans, Mongols, Arabs, etc., from all sides, South, North, and West. But, owing to its peculiar geographical position of extraordinary dryness and its lack of big grazing lands, the conquerors never got a stronghold in this region enabling them to settle there permanently. "Geography determines History". This is the most striking case. Further reference to this point is made in the discussion of its historical development later in Chapter III.

B. The Monotony of its cultural landscape

Secondly, another interesting point to be noted is that there are few places in the world where the natural landscape is as monotonous and the cultural landscape so completely dominated by the former. Here are only desert lands, mountains, specks of cultivable lands, oases, etc.

Owing to the same geographical setting, the same vegetation, same type of agriculture, same type of houses, and almost the same economic life is found everywhere. The only exception is in Lop-nor and part of Karashar and regions along the mountain fronts of Kashgar, Osh-Turfan, etc. where a considerable amount of animal husbandry and fishing is carried on. It appears to be a very tiresome and wearisome country to the travellers. As Mr. Schomberg has rightly remarked:

> "The monotony of the whole area must be almost unequalled. It was not a case of a great desert or level prairies or natural feature necessarily unchanged,--and yet the impression gained was one of complete uniformity. The landscape at Niya was the same as at Charkhilik, three hundred miles on, or at Tikkenlik 200 miles north. It is no exaggeration to say that other places nearer Aksu or Kashgar were not very different. Day after day there was the same vegetation, useful and adequate, but identical and unrelieved."
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C. The region's cultural landscape as affected by its physical environment--especially its soil and climatic conditions

As has already been pointed out, every traveller to this region has been impressed with the monotony of its cultural landscape. Nevertheless, there are several typical conditions, as affected by its soil and climatic conditions, concerning the general cultural-pattern of this region, which may be mentioned.

(a). Villages patterns and house-types.

First of all, the typified village pattern of this

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54. Schomberg: Peaks and Plains of Central Asia, 1933, p. 252.

region is worth mentioning. Villages owing to the limitation of water-supply, are congested. In many cases farmsteads are clustered in one place to one side of the fields. Thus, many farmers have always a pretty long distance to go daily for their work. This is mainly due to the fact that fields have to conform with the general flow and construction of the irrigation channels and should be near the source of water. Therefore, it has often been necessary to shift the cultivation fields as the general flow of the river or the irrigation channels changes, whereas the buildings of a village are occupied unless or until it becomes absolutely impossible for the farmers to go to their fields. As a rule, most of the farmsteads are built on the top of the loess cliffs, which are characteristic of its landscape. They generally consist of closely packed, flat-topped houses of wood and stone with curious raised platforms over the middle of the roof. In many other cases, houses are built of loess mud. The loess, after being mixed with chaff and water, forms the staple building material in this region. Sun-dried loess bricks are found heaped at the door-ways of the farmsteads ready for the building or repair of houses. Owing to the excessive aridity of its climate and the almost complete lack of washing by rains, these loess bricks are very durable and have proved to be one of its best and cheapest building materials. Although the average height of the farmhouses appears to be a little low, in comparison with those of Inner China, they are on the whole fairly good-looking and comfortable.

Especially, they are even more solid and durable than those in Inner China, otherwise they could never stand the constant attack of the strong sand-storms of this region.

(b) Predominance of orchards

Secondly, another interesting thing which characterizes the cultural-landscape of this region is the wide-spreading and predominance of the orchards. It is said that nearly every rich family has a private orchard. Especially this is true in Hami. In Hami it is estimated that the general acreage of the orchard exceeds the total acreage of all other crops. These orchards are intersected with numerous irrigation channels and are planted with a confused mass of fruit trees, mostly plums, apricots, peaches, pomegranates, and walnuts. Although the quality of most of the fruits produced in this region is very good, the general yield has been very low in comparison with most of the orchards in Inner China. This is partly due to the neglect of proper spacing and the lack of scientific knowledge of grafting and pruning.

(c) Land utilization and the special characteristics of its agricultural practices as affected by its soil and climatic conditions

Moreover, there are several interesting, typical, and unique agricultural practices which have a great effect upon the general cultural landscape of this region and deserve special mention.

In the first place, there is a very wide-spread practice of fallowing in this region. Land cultivated one

year is idle the next. Although the average size of a farm has generally been estimated to be about 6 acres, according to the report of the provincial government, as a matter of fact, owing to the wide practice of fallowing system, that size should be doubled. Evidently, this practice is not due to the infertility or exhaustion of mineral materials of the soil, but is probably because of the insufficiency of water-supply, the idea being to conserve the moisture content of the soil and to assure good yield. But according to some of our agricultural experts, this practice of fallowing in this region is not due to the exhaustion of fertility of its soil nor is it on account of the insufficiency of its water-supply, but, rather, on account of the great amount of available vacant land and the few peopel. The natives are accustomed to plant only part of this land. With an increase of population this practice might be automatically eliminated. The native farmers have been very neglectful of soil fertility and of the application of fertilizers to their fields. Only horse and cow manures are occasionally applied. The role of legumes in conserving soil fertility is unknown to the native farmers. Unlike Inner China, legume-fringed cereal fields are very seldom seen in this region.

Secondly, on account of its favorable climatic conditions, sericulture has been practiced with marvellous success in this region, particularly in Khotan. The silk products, known as "Hsia-yi-cheo", of the latter are especially famous all over Central Asia, even in Inner China

and European countries. This is because due to the fact that during the time of the growth of silk-worm, the weather is warm and dry--damp and cold weather has often caused silk-worm plague--which is a very favorable climatic condition for silk-worm development. Silk-worm plague, as often happens in south-eastern Inner China, where the weather is sometimes cold and damp in the spring, is very seldom known in this region. Moreover, special attention has been paid to the cultivation of mulberry trees. Mulberry trees in this region are in much higher stalk and have bigger leaves than those grown in Inner China. Another interesting thing in connection with this is that in this region, unlike Inner China, where the silk-worm industry has been exclusively a job of women, the industry is carried on entirely by men.

Thirdly, there are interesting and sharp distinctions between the Chinese farmers--who are rather few in number--and the native farmers. Although in the general line of cultivation of cereal crops, the Chinese farmers and the native farmers have been practically the same, yet in the cultivation of fruits and vegetables we find very interesting differences. For instance, vegetables such as cabbage, lettuce, tomatoes, etc. being recently introduced into this region, are widely grown in the fields of the Chinese farmers but seldom so among the natives. This has been purely a result of different cultural backgrounds and different traditions. Generally speaking, the native farmers are more conservative than the Chinese. They are very reluctant

to change or to adopt things new to them. When the Swedish missionaries first (probably about 1900) introduced the cultivation of potatoes into this region, only the Chinese farmers accepted it whereas the natives refused them. Again, the natives have planted flax--with a pretty big acreage--in this region for hundreds of years and have recovered oil from its seeds for cooking and lighting purposes, but they never knew that linen could be recovered from its fiber. The Chinese farmers taught them that this can be done but the natives have been reluctant to adopt flax-fiber production. This still holds true at present. Most interesting of all, the means for extracting oil from the flax-seed--a simple stone roller--has remained very primitive. Some time ago, probably in 1920, one Swedish missionary introduced a machine for this purpose. But, afterwards, the Mullah, that is, the priest of this region, who has very strong power over the secular affairs of the people, heard of this and proclaimed that the oil extracted from the machine is unclean and prohibited it to the people. Consequently, the machine was forced out of use. Above all, the refusal by the Kashgarians to cultivate rice on a big scale has always been a puzzle. This is not at all because of any serious handicap in natural environment, such as soil, climate, or water-supply, but it has also been a matter of their old traditions. Because in early days rice was not cultivated extensively in Kashgar, probably due to the greater demands of labor, so the people have been very reluctant to change since. In addition to

the special physical qualities that have affected its cultural landscape, all these instances are mentioned at the same time to show how the conservative nature of the natives has also been a great factor in shaping the present cultural landscape, especially the agricultural practices, of this region.

In conclusion, it is safe to say that the Geographical position of this region has not only determined its historical fate in the past, shaped its cultural landscape at the present, as pointed out above, but is likely to affect her development in the future. Separated from the rest of the world by major deserts and lofty mountains, through which it has been difficult for outside influences to penetrate, it is probable that the region will long remain inward-looking and change will certainly be slow.

Chapter III

Historical Geography of the Tarim-basin

This region, the Tarim basin or Tien Shan Nan Lu, known as "Western regions" in the early Chinese Records, owing to its geographical position, has been a center or an orbit of changing occupancies of various tribes in the past centuries. It is one of the best regions in which to study this problem of sequence of historical occupancy, which is not only of historical interest but also of great geographical significance. This section will be divided into two parts: First, general statement on the important conditions of historical occupancy of this region and second, the historical geography of its various natural regions.

I. Brief survey of the region's history:

A. General statement

Although there has been a legendary saying that this region, the Tarim basin or Tien Shan Nan Lu, was known, even actually occupied, by one of the Chinese emperors of Chou Dynasty, named Wang Mong, about 1000 B. C., so far no historical proof has been found. Some of the western scholars, for instance, J. G. Andersson advocated that China had connection with the Central Asian Regions, including Tien Shan Nan Lu, and that migrations and trade were carried on in the very early days. On the other hand, many others, such as Dr. A. Hermemann suggested that the Chinese, in truly ancient times had no direct knowledge of the regions west of Kansu.

This question whether China knew anything or had any contact with the "Western Regions" in the very early days remains a matter of conjecture.

However, it was generally agreed that the most reliable date for the first contact of the Chinese with this region was in the period of Han. According to the historical annals of the Former Han Dynasty, under the chapter on "Notes on the Western Regions", the first Chinese mission sent to this region was under the leadership of Chang Kien about 138 B.C., despatched by Emperor Wu-ti of the Former Han Dynasty. He was appointed with the sole object of making an alliance with Yue-chi to fight the Hsiung-nu, who at that time were very strong and were causing constant trouble in the border of North-western China--the present Kansu province. The Yue-chi, a people of doubtful origin, identified by some scholars as Indo-scythians, at first found their abode at the northern foot of Nan Shan. Afterwards, the Hsiung-nu, later known as Huns in Europe, came from Mongolia to attack the Yüeh-chi. The latter were decisively defeated. Their leader was killed and his skull was made into a drinking cup by the Liao-Shan-yu, the king of the Hsiung-nu.[1] Instead of being the subjects of the Hsiung-nu, the Yüeh-chi withdrew westward and established a kingdom at or near the Oxus Valley. The final goal of Chang Kien's mission was to seek an approach to these people, but, unfortunately, he was captured on his way by the Hsiung-nu. After being kept in prison for about

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1. Shi-chi, vol. I, p. 18.

ten years, he finally got free and succeeded in reaching the Yu-chi. At this time the Yu-chi had no intention of revenging themselves against the Hsiung-nu and refused to form an alliance with the Han Dynasty. In spite of the failure in his real and first object, Chang Kien returned with a great deal of valuable and interesting information concerning these regions west of China. His geographical reports are so fantastic and fascinating that the Emperor was deeply impressed and made up his mind to communicate with these regions.[2]

At that time the Chinese geographical knowledge of this region was rather limited and obscure and a very ambiguous name "Si-yu" or "Western Regions" was applied to the big area of the present Central Asia. According to the record of the Former Han Annuals, "Si-yu" or "Western Regions" was used in a very ambiguous sense. It says:

> "'Si-yu' or Western Regions, being divided into 36 nations and later again divided into more than 50, was a region situated in the West of Hsiung-nu, south of Wu-sun, surrounded by lofty mountains both in the South and North; with river in the center; on the East bordered the Yu-men-kan of Han, and with the West limit near Tsung-ling."[3]

Evidently, so far as this topographical description stands, it definitely refers to the present Tien Shan Nan Lu or the Tarim basin only. But, on the other hand, if we will examine the names of these fifty-five nations as listed in the Former Han annuals, this is not the case at all. Let us examine

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2. Biography of Chang Kien, Tsien Han Shu, vol. 42.
3. "Notes on Western Regions," Historical Annuals of Former Han, vol. 85, p. 4.

briefly these nations and see how they contradict the first topographical definition of this region given by the same writer.

A list of Ancient Kingdoms in the "Western Regions" and their corresponding localities at the present, as found in the Han Annals:[4]

Ancient Kingdoms:	Their corresponding positions at the present:
1. Lo-tsang	Charkhilik
2. Shan-shan	Southern part of Lop-nor
3. Chi-mo	Charchen
4. Siao-wan	Southern part of Cherchen
5. Ching-tsueh	Po-sze-tanto of Khotan
6. Yung-luh	Southern part of Yu-tien or Keriya
7. Yu-mei-kuo	Eastern part of Tsieh-lieh
8. Chueh-leh-kuo	Southern part of Tsieh-lieh
9. Yu-tien-kuo	Khotan
10. Pi-shan-kuo	South of Pi-shan
11. Wu-toh-kuo	A region around Pamir?
12. Si-yien-kuo	South of Yieh-chen
13. Pu-li-kuo	East of Sariqol
14. I-Nai-kuo	South-eastern part of Sariqol
15. Wu-lowe-kuo	A region near Pamir?
16. Lan-tou-kuo	Western part of Sariqol
17. Yien-pin-kuo	North-western part of Afghanistan
18. Wu-I-Shan-Ni-kuo	Kashmir
19. An-hsi	Persia
20. Ta-yueh-chi	Oxus Valley
21. Tah-hsia	South of the Oxus River
22. Kan-chueh	Samarkand
23. An-tsai	Eastern Shore of Caspian Sea
24. Tah-yuan	Ferghana
25. Tao-hwai-kuo	?
26. Shui-shiu-kuo	?
27. Tsan-tu-kuo	?
28. Sha-ke-kuo	Yarkand
29. Su-leh-kuo	Kashgar
30. Wei-tao-kuo	Wu-sih

4. The Former Hann Annals, the Section on "Western Regions," vol. 85.

A list of ancient kingdoms in the "Western Regions" and their corresponding localities at the present, as found in the Hann Annals (Continued): (A map is attached to this effect, see Map III)

Ancient Kingdoms	Their corresponding positions at the present
31. Wu-su-kuo	A region around Ili
32. Ku-mei-kuo	A region near Ha-loh-Yur-kun of Wu-shu
33. Wu-suh-kuo	Wen Suh
34. Kwei-tze-kuo	Kucha
35. Wu-tieh-kuo	East of Kucha
36. Chueh-leh-kuo	Korla
37. Wei-likuo	Wei-li
38. Wei-shui-kuo	Karashar
39. Yen-chi-kuo	South of Yen-chi
40. Wu-tan-tze Shui-lai	North-east part of Fu Kan
41. Pei-luh	Fu-kan
42. Pei-luh-heo-kuo	North-east part of Fu-Kan
43. Yueh-li-shih-kuo	Fu-yuan
44. Pu-lue-kuo	Barkul
45. Shan-yuan-kuo	North-west of Urumchi
46. Pu-lue-heo-kuo	North of Barkul
47. Si-chush-mei-kuo	A region around Shui-lai ?
48. Tung-Chieh-mei-kuo	Near Chang-chih
49. Tsieh-kuo	North of Chang-chih
50. Hu-hu-kuo	North of Turfan
51. Shan-kuo	East of Wei-li
52. Chuh-shi-chien-wang-kuo	Turfan
53. Chueh-shih-heo-kuo	Tieh-hwa or Urumchi
54. Chueh-shih-tu-wei-kuo	East of Turfan
55. Chueh-shih-heo-chen-chang-kuo	Chi-tai

The present list represents the personal opinion of the writer and is subject to corrections by prominent authorities on this region.

It is rather curious to note that these nations, such as Wu-sun, Yu-li-shih, Wu-tan-tsze-li, Pu-lu, Si-Chai-mei, Tung-Chai-mei, etc. all belonged to the regions of the Tien Shan Pei-lu, and were not in the geographical sphere of the Tien Shan Nan-lu or the Tarim basin. Besides, many others,

Wu-tan-chi-li
Shan-yuan
Chiehkuo
Pi-luh-keo-kuo
Xulishih
Chush-hih
Heo-chan-chen
Pu-kwei-huo-kuo
Chuh-shi-heo-keo
Lichairnei
Pihlu
Tungchairnei
Huhu
Pu-kwei-kuo
Chuh-shih-chien
Chin-shih-tu-wei
Kur-inei
Sai
Yenchi
(Kara-shar)
Kucha
Luntai
Wen-sun
Weili
Mei-shan
Shan-ku
Shan-shan
Cher-chen
Ching-tsueh
Charkhlik
Yu-mei
Husi-luh
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Wu San Abode

Hsuan-yuan Abode

Wu-tan-chi-li

Shan-yuan

Pi-luh-keo-kuo

Yulushih

Chiehkuo

Chuh-shi-heo-keo

Chush-hih

Heo-chan-chen

Pu-kwei-huo-kuo

Pihlu

Lichaimei

Tungchaimei

Huhu

Pu-kwei-kuo

Chuh-shih-chien

Chin-shih-tu-wei

Urumchi District

Kur-mei

Kucha

Sai

Luntai

Yenchi (Kara-shar)

Wen-sun

Weili

Mei-shan

Shan-ku

Shan-shan

Cher-chen

like Kwei-ping, (Kashmir), Wu-I-Shan-Li (North-western part of Afghanistan), An-hsi (Persia), Ta-Yueh-chi (the present Oxus valley), Kanchu (Samarkand), Tah-yuan (Ferghana), etc. actually lay far beyond the present boundary line of Sinkiang province. They correspond to the regions of the present Western Turkestan, Afghanistan, Persia, and North India. This contradicts the first topographical definition and indicates at least that this name "Si-yueh" or "Western Regions" was used in a very ambiguous sense in the early Chinese records and was meant to include all the territories West of Yu-men-Kwan. It was toward these areas, "Western Regions" in the broad sense, that Wu-ti directed his expeditions.

The steps taken by the Emperor Wu-ti for his expedition in this region will now be briefly reviewed. His first move was to get a stronghold on the northern slopes of Nan Shan, which is the gateway to the Tarim basin or Tien Shan Nan Lu, "Si-yu" or "western regions" in the broad sense, and was at that time blocked by the Hsiung-nu. After repeated wars against the latter, he succeeded in doing this in 121-115 B. C. and freed all the territories of the North-western border of China, corresponding to the present Kanchow, Liang-chow, and Su-chow of Kansu. The Hsiung-nu were compelled to retreat North of the desert. Immediately after that by 108 B. C. Emperor Wu-ti started the building of the Su-chow-Yumen section of the Great Wall, with an extension of another 400 miles. This latter served as a rampart for protecting Chinese military expeditions into this region. After that

time the gate-way to the "Western regions" was opened and safe-guarded. Consequently, many missions, including the famous mission of Chang Kien to the king of Wu-sun, were despatched by the Emperor. Trade was started along this route and the Chinese silk-stuffs were carried through Parthia and Syria to the Mediterranean lands.

Meanwhile, A chinese ambassador was murdered by the king of Tai-yuan (Ferghana). In order to avenge him and to preserve their prestige in the remote area, the Chinese sent their first large-scale expedition into this region in 104 B. C. Owing to the difficulties in crossing salt-marsh in Lop-nor, this turned out to be a complete failure. Later, in 102 B. C., General Li Kwan-li, with thirty thousand soldiers set out once more from Tun-hwang on a new expedition. At this time he established many military stations along the salt-marsh of Lop-nor. Besides, in order to safe-guard food-supplies, he established many military-agricultural colonies along the main trade routes of the Tarim basin. Finally General Li reached the capital of Tai-yuan (Ferghana) and won a decisive victory. From that time on Chinese supremacy was duly acknowledged by all the nations from the Tarim basin to the border of Caspian Sea.

By the reign of Hsuan-Ti of the Former Han Dynasty, Chinese control over the whole region of the present Sinkiang province, including both Tien Shan Nan Lu and Tien Shan Pei Lu was firmly established. An office of Protector-general was appointed, with head-quarters at Wu-tieh-chen

(Kucha), to take charge of the whole region. In spite of the constant trouble caused by the various nomadic tribes, notably the Hsiung-nu, the Chinese for over a century controlled the natural highways leading into the Tarim basin and to other parts of Central Asia very successfully. This marked the initial stage for the intermingling of the various cultures, including Iranian, Indian and even Greek and Roman.

Owing to the internal disorder of the latter dynasties of the later Han, Chinese control over this region gradually faded away. At the time of the reign of the usurper, Wang Mong, (A. D. 9), all the territories of Central Asia, including the Tarim basin, and areas adjacent to it were lost to the Hsiung-nu. It was not until 73 A. D. under the reign of Ming-ti, that a renewed military policy of reconquering the region was attempted. Consequently, Hami, an oasis of great strategical importance, situated at the mouth of both the northern and southern routes of Tien Shan, was occupied by the Chinese until 77 A. D.

Later, by his military genius and skilful political talent, Pan Chao, a memorable figure in the history of Central Asia, reconquered the whole area of Central Asia in 94 A. D. It was said that he not only crossed Pamirs, but also conquered fifteen kingdoms lying between Kashgar and the Caspian Sea. According to Stein, at that time, "China had established diplomatic relations with the Parthians and had also sought to have direct contact with the distant Ta-chin (Syria) by means of a mission which in 97 A. D.

appears to have reached the sea in the Persian Gulf."[5] It has also been said that at this time the western ancient geographer, Ptolemy, learned about the land of the Seres of the "land of Silk", that is, China.[6] He gained this knowledge from Marius of Tyre, who in turn based his reports on the Macedonian merchant, Maes Titanus, who actually traversed this region.

By A. D. 107, revolts in Western regions came up and the Chinese once again lost their political holds there. The various attempts made to recover it later, notably the expeditions of Pan Yung, only partly succeeded. At the time of the downfall of the Han Dynasty in 220 A. D., Chinese prestige in this region had dwindled.

At the time of the Three Kingdoms (A. D. 220-265) and also the Chin Dynasties (A. D. 265-419) China was too much bothered with internal troubles to pay attention to these regions. For a short while these nations of the oasis of the Tarim basin enjoyed independence, but trade and cultural influences from both the East and West flowed uninterruptedly through this region.

During the time of "Wu-hu" or "Northern and Southern Dynasties", the "Western regions" were controlled by a branch of Hsiung-nu, known as Juan Juan or Hephthalites or White Huns in the Chinese and Western Records respectively. At this time Buddhism continued its increasing growth in the region. The most reliable historical records of Chinese source

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5. Stein: Innermost Asia: Its Geography as a factor in History, Geographical Journal, vol. XV, no. 5, May 1925, p. 484.
6. Ibid., p. 484.

concerning this region were preserved by the narratives of two early famous Chinese pilgrim travellers, Fa Hsien, (A.D. 400) and Sung Yuan (A.D. 519).

In the middle of the sixth century, the Western region was taken from the hands of the White Huns and came under the yoke of Western Turks, known as Tu-chueh in the Chinese records. The latter, with a center of power in the North of Tien Shan, ruled by the Paramount Chief, were like all the former nomadic tribes, content with the extracting of tributes and taxes from these oasis nations in the Tarim basin and they left their other affairs unaffected. Consequently, trade with the outside--except that serious troubles were made by these Turks sometimes in Inner China--and cultural mingling processes were continued.

During the earlier part of the Seventh century, China, after a disunion for more than 300 years, became re-united under Tang Dynasty. A positive policy toward the "Western regions" was soon sought. In 640, the Chinese army occupied Turfan, and later on, Karashar and Kucha. It is interesting to note that only through the records of the great Chinese Pilgrim, Hsuang-tsang, who after 17 years wandering in India, returned to China via Khotan, we learned that the early trade-route or the key-path leading from Loulan into the Tarim basin had been abandoned for centuries. (Incidentally, it is interesting to note that the present usage of this route, Tien Shan Shan Lu, has a different meaning from that of the "Tien Shan Nan Lu" as recorded in the Han Annals. At that

time, in the southern slope of Tien Shan, two routes were followed: One leading from Anshi, Hami, via Turfan through Kashgar, Kucha, into the Tarim basin, known as the "peh-lu" or northern road, and the other via Loulan, Lop-nor, to Khotan, known as the "nan-lu" or Southern Road. But, now the latter, the "Tien Shan Nan Lu" of the Han Dynasty, has been abandoned for many centuries and the former, "pei-lu" of the Han Dynasty is now commonly known as the "nan-lu" or the Southern route. While on the other hand, the present "peh-lu" or northern route, corresponding to the route from Hami, via Ku-chen-tze to Urumchi and then into the Dzungarian Valley, has nothing to do with the so-called "pei-lu" of the Han.) About 658, after a big victory over the western Turks on the banks of Ili Valley, the entire province was annexed to Inner China again.

At this time, this region of the Tarim basin was known as "Sze-chen" or "Four-garrisons", including Kucha, Karashar, Khotan, and Kashgar, where the Chinese forces were stationed. The whole Chinese Central Asian possessions were controlled by two protector-generals, known as the Anshi-Protector-General, controlling all the territories of the Tarim basin with its head-quarters at Si-cho or Turfan, later removed to Kwei-tze (Kucha); and the other was Pei-ting-Protector-General controlling the territories of Northern Tien Shan and the Kirghiz steppe, with its head-quarters at Tin-chow, or the present Tieh-hwa or Urumchi. Trade and communication between West and East via the Tarim basin reached its zenith at this period.

Unfortunately the prosperity of Tang did not last long. At the end of the Seventh Century, the Tibetans from the South became strong and invaded the Tarim basin. Later, in the middle of the eighth century, the Arabs, under the leadership of Kutayba ibn Muslim, after his conquest of the Oxus Valley, also proceeded to attack the Tarim basin from the West. Both of these invaders intended to join hands and to fight against China. It was with the aim of blokading or preventing their meeting that the famous Chinese general, Kao Hsien-chi, with ten thousand soldiers, in 747, crossed the highest range of the world, Muz Tagh Ata, or Pamirs. This was really a marvellous accomplishment, if the extraordinarily difficult conditions of communication in those days are taken into consideration. Later, his successful crossing of the most difficult Darkot Glacier at an elevation of 15,600, with a Chinese force of three thousand men, was even more remarkable. Dr. Stein has time and again mentioned this in his different works as the best proof to show the capacity of the Chinese in overcoming such a difficult natural environment. However, in spite of these efforts and some minor victories, the Chinese were defeated by the Arabs and Tibetans. About the end of the eighth Century, the whole province of "western regions" was captured by the Tibetans and all communication with that region from Inner China was thus completely cut off. In spite of this, Chinese officials still maintained their authority for some time, as is testified by the report of a Chinese traveller named Wu-kung, who traversed this region then.

The Tibetan occupation of the Tarim basin lasted less than one century. They were later replaced by the Uigurs. For over two centuries, the Uigurs, of Turkish stock, generally accepted as the descendants of the Hsiung-nu, who formerly lived in the north-western Mongolia and later migrated to the Tarim basin, dominated the whole area of Western Regions. To them the credit of introduction and conversion of the whole Tarim basin into Islamism should be given. In the middle of the tenth century, Boghra Khan, a powerful Uigur Chief, became the first convert. Later, he waged many wars against Turfan and the adjacent areas for their conversion to Islamism. After his death, by the effort of his energetic and faithful son, Hassan, and afterwards by his widow Bibi Merriam and many other martyrs of the faith, Khotan, Yangi-hissar, and the whole Tarim basin were converted to Islamism. Since then Turki has been the universal language of that region. At the same time, Buddhism, after enjoying a long time of prosperity, began to fade away gradually in this region.

In 1126, a leader of another Manchu tribe, the Tanguts from the Kara-khiti or Liao Dynasty of China, being driven from Eastern Mongolia and north China, fled to the Tarim basin and established their supremacy there.

In the thirteenth century, Jengihiz Khan, the founder of the Monghul Empire, conquered the "Western regions". The Tarim basin then took the name of Monghulstan. Thirty years later, the Mongols annexed the whole of China, known as the dynasty of Yuan. During this period, owing to the tolerant policy adopted by the Mongol emperors, free communications

and exchange in religion, trade, arts, between the East and the West had reached its zenith. It was at this time that the Venetian traveller, Marco Polo, in 1274 visited China by the way of the Tarim basin. He travelled from Persia to the upper Oxus Valley and then crossed the Pamir into the Tarim basin. There he followed the caravan road along the foothills of Kuen-lun, leading into the Southern edge of Lop-nor, and then through Tung-hwang, Suchow, Kanchow, of Kansu province into Inner China. His travel-notes, together with those of Hsunag-tsang, are regarded as the best literature in the study of the historical geography of this region.

Later, Jengihiz Khan assigned the Tarim basin, together with many adjacent territories, to his second son, Chagatai. He, with his ruling seat at Kuldja or Ili, in turn, bestowed the Tarim basin on the Dughlat family. The chief of this family later became the hereditary ruler of the region. After a period of about 200 years of constant strife and conquest for the throne among these Mongol tribes, this region was laid waste. It was said that in one of these wars, in 1513, the Aba Bakr destroyed the Eski Shahr, the ancient Kashgar, by turning the River Kizil Su (the upper stream of the Kashgar River) from its course in order to undermine the fortifications. During this period Mohammedanism won over the whole country and dominated all the other faiths.

Down to the Ming Dynasty, Chinese policy in "Western regions" was merely defensive. They left the whole region at the mercy of the Mongols and later the Khodja family rulers. Their chief attention was directed only to the safety of their north-western border at Kansu.

In 1572, during the reign of Rashhid Khan, the last ruler of the Chagatai dynasty, there came from Samarkand a Mohammedan priest, named Makhdum-i-Azam (The Great Master) also known as Sayyid Khodja Hasan. This man, known as the founder of the Khodja family, later through his religious influences usurped the government from the Mongols and established a theocracy. Khodja is a name for a family-tribe and also a title meaning gentleman. They were said to be the saints, the direct descendants of Mohammed. With their religious influence they had won much favor among the people of their faith in this region. Soon after the death of Hassan Makdum Azam, his followers divided into two schools. The followers of the eldest son, Khodja Mohammed Amiur, were called Aktaghlik, or "White Mountainers"; while those supporters of the youngest son, Khodja Ishak, were called Karataglik or "Black Mountaineers". They waged a deadly feud against each other and laid waste large parts of the country. For about 200 years they dominated the whole area of the Tarim basin.

With the appearance of Tsing Dynasty, it became the policy of one of its enlightened emperors, Chien-lung, to take a positive attitude toward this region. In 1755, he despatched a large part of his army and conquered the territories north of Tien Shan or Dzungaria, which were then occupied by a Mongol tribe, known as the Zungars or Kalmuks. They had become a very strong military tribe living North of Tien Shan. They, with the aid and co-operation of the Khodjas had also extended a very strong influence in the Tarim basin.

After defeating the Zungars, Emperor Chien Lung started to crush the Khodja rule in the Tarim basin. He won a complete victory in 1759. All the Khodja family were driven back to Kokand. Following the example of Han and Tang, Chinese prestige and rule were reestablished again in this region.

The Khodjas never ceased to attempt to regain control over this territory. By working on the religious feeling of the people they had time and again caused the latter to revolt against the Chinese. Many attempts to expel the Chinese rule were made after that. Constant invasions were led by Jahangir, in 1830, by Ishan Khan, or Katta Kura, and later by Wali Khan in 1857, all being descendants of the Khodja family. Notwithstanding their short-lived successes, they were all repulsed in the long run. Later, in 1862, as a result of the rebellion of the Tungan Mohammedans in the province of Kansu, the Khodja family dared another chance to reoccupy this territory. Towards the close of the year 1865, Buzurg Khan, a descendant of the Khodja family, a refugee in Kokand, immediately started for Kashgar, with a following of only 66 men under the command of a famous general named Yakub beg. The latter afterwards became the sole dictator of this region. Immediately after his arrival at Kashgar, Buzurg Khan was set on the throne, but was soon deposed by his general Yakub Beg.

With his military genius, as well as good fortune, Yakub beg succeeded in conquering all the nations east of Kashgar, including Khotan, Aksu, Yarkand, Turfan, and even as far as Urumchi. Later he had himself proclaimed Khan of all Turkestan with the title of Atalik Ghazi (Champion of the

faith). Being gifted with a political mind, Yakub Beg earnestly intended to establish friendly relations with foreign powers. By this time, Russia was busy with her conquest of Western Turkestan, while England had already gained a stronghold in India, the South-western neighbor of this region. At his invitation, two Russian and two English missions, under the leadership of Captain Reinthal in 1868 and 1870 and S. Forsyth[7] in 1870 and 1873 respectively, came to visit this region. Besides, he also sent special envoys to Constantinople to pay respect to the Turkish Caliph and to acknowledge the suzerainty of the latter. He ruled the region unmolested from 1865-1877.

By this time, the Chinese having quelled the Tunganis Mohammedan Revolutions in the province of Kansu again began to exert steady pressure on this region. An expedition, with a large number of soldiers, was led by Tso Tsung-tang, one of the most brilliant generals of Tsin Dynasty. He met the exceptionally difficult situation of transportation and food-supply by sending armies ahead to sow crops in order to prepare food-supplies before he sent the rear army forward. Crops were grown and gathered at each oasis on the way across the desert. By such a pain staking method, he reached this region after a period of two years. Later in 1877 he reconquered the whole province, from which the Chinese had been expelled for 14 years.

Since its reconquest in 1877, this region, together with Tien Shan Pei Lu or Dzungaria, instead of being called

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7. See: Landsell, H., Chinese Central Asia, vol. I, p. 368 and vol. II, p. 60; Forsyth: Second Mission to Yarkand; Bellew, Shaw: Kashgar and Kashimir.

with such a vague name as "Si-yueh", or "Western regions", has been retitled with a new name, "Sinkiang" or "New Dominions". Hence-forward, the general policy of ruling by the Chinese has also been duly changed. Instead of treating it as a colony or a buffer state, it has formed a province of Inner China, on the same footing as the other inner provinces. Since then the whole region has remained undisturbed under Chinese rule. Only in recent years, in 1930, on account of the corrupted rule of the Chinese officials, an uprising occurred at Hami and later spread through most of the oases of the Tarim basin. This has not been fully settled as yet.

B. Summary:

Thus far a brief survey of the general historical conditions of this region has been made. Before proceeding to discuss the historical geography of its various natural regions, three unique things characterizing the long history of this region should be mentioned.

In the first place, there are probably few places in the world where invasions from outside occur as often as in this region. For the past two thousand years, it has been invaded by many nomadic tribes from all sides--South, West, and North, not mentioning the organized expeditions of the Chinese from the East. But, as already pointed out in the previous section, Geography determines its history. In spite of all these invasions and conquests by these various tribes, no one has succeeded in making their permanent settlements there. This was totally a result of geographical limitations. Regarding this, Dr. Stein has given us one of the most excellent explanations:

"In that exceptionally arid region climatic conditions would allow comparatively large communities to exist only on the basis of a highly organized system of irrigation. Such a settled population dependent on an orderly regime was specially suited for the absorption and transmission of cultural influences coming both from the Far East and the West. Geography in other respects, too, seems to have singularly prepared the Tarim basin for this in its chief historical role. By denying grazing grounds to the vast basin between Kuen-lun and Tien Shan, nature had protected it against ever becoming the scene of great migratory movements and such up-heavals as are bound to accompany them."

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Secondly, although China has been connected with this region as early as 2,000 years ago, the period of her actual occupation has been very short. As it has been said, it amounted altogether only to 427 years up to 1922.[9] Again, because of its huge physical distance from China, together with the terrifically poor means of communication in the desert, China in the past had a hard time establishing a stronghold in this region. Whenever there were internal troubles in Inner China, the nomadic tribes rose up and took the chance to invade this territory. Thus, this region has almost become a sort of barometric measurement for the internal stability of China. But, owing to its exceptionally strategical importance, as a rampart for north-western border of China, regardless of whatever physical difficulties she had to encounter there, China never failed to reconquer it as chance permitted.

Thirdly, since the last quarter of the nineteenth century, the general political set-up has been radically changed. Instead of being surrounded by those uncivilized

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8. Stein, On Ancient Central-Asian tracks, 1933, p. 24.
9. Skrine, C. P. Chinese Cent. Asia, p. 58.

nomadic tribes in North and West, for the first time in her history she has had as neighbors some of the most highly civilized powers of the Modern world, that is Russia and Great Britain. This is really a phenomenal thing and the future historical development of this region will undoubtedly be influenced by this fact.

2. Historical Geography of various natural areas:

In discussing this topic only the six most important oases will be chosen, viz. Kashgar, Khotan, Yarkand, Kucha, Kara-shar, and Turfan. The following points in each will be briefly dealt with:

A. Evolution of the geographical names of the oases and their general physical settings.

B. Geographical notes on these oases as appearing in the most important early geographical works.

(1) Kashgar

A. Evolution of geographical name and general physical setting.

Kashgar, one of the most important oases of the Tarim basin, is situated at an elevation of over 4,000 feet in 39° 30' N, 75° 63' E. It is eighty-five li (about 1/3 of a mile) East of Ho-se-pu-I-chwan adjoining Kai-shi; 100 li South of Chua-ma-teh-liej-keh-chwan adjoining Yangi-hissar; 10 li West and 7 li North adjoining Su-fuh. The dimensions of this oasis are 95 li from West to East and 109 li from South to North.[10] It was known as Su-leh from the Han to the Tang dynasty and was called Sha-leh in the early writings of Sung Yuin, and Chi-sha, in that of Hsuan-tsang. Marco Polo called it "Cascar" in his travel notes. Various theories

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10. Topographical Records of Sinkiang, vol. 4, p. 3.

have been formed by historical geographers regarding the origin and entymology of this name. Some attributed it to Sanscrit while others said that it may be derived from the Russian.[11] This word, Kashgar, which is to some writers presumably of Turkish origin, meaning "various kinds of brick house" was perhaps used to symbolize the wealth of this region.

B. Geographical notes on this area as appearing in the most important early works:

Geographical notes are found in many of the early Chinese works, but, for the present purpose, only the most important ones may be mentioned.

(1) In Tsien Han Shu (202 B.C.-220 A.D.) (The Historical Annals of Former Han), under the title of "Si-yu-Chwan" or "Notes on Western Regions", it is mentioned that Su-leh or Kashgar is 935 li from Changan, that is, the present Si-an, Shensi. It was said to contain 1,510 families comprising a population of 8,647 and with 2,000 trained troops, with a market for goods and was in the road directly west of Ta-yueh-chi, Ta-wan, (Ferghana) and Kan-chu, (Samarkand). By this brief reference we can easily assume that Kashgar was then a center of Central Asian trade and already occupied a very important position in the Tarim basin.

(2) Fa Hsien's (400 A.D.) notice of Kashgar:

Fa Hsien, in his travel-notes, makes some interesting remarks about Kashgar, which he calls Chia-sha. The following extract may be quoted: "The country, being among the hills and cold, does not produce the other cereals and only the wheat gets ripe." It is interesting to note that this still

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11. For a detailed discussion of this, see: Stein: Ancient Khotan, Vol. I, pp. 47-51.

holds true at the present time, as we know rice is not cultivated to a great extent in this area today. Most of the rice consumed here has been transported from Yarkand and Aksu, notably the latter.

(3) Hsuang-tsan's (629-44 A.D.) description of Kashgar:

Kashgar, called Chi-sha by Hsuan-tsang[12], is described as a territory about 5,000 li in circuit, containing much sandy desert ground but lacking cultivable soil. The soil is described as being very fertile and flowers and plants are found to be abundant. The climate is described as agreeable and temperate, winds and rain arriving with regularity. The people are described as fierce and impetuous.

(4) Among the early works written by western scholars concerning this region, Marco Polo's travel-notes may be mentioned. He says:

> "Cascar is a region lying north-east and east, and constituted a kingdom in former days, but now it is subject to the Great Khan. The people worship Mohamet. There are a good number of towns and villages, but the greatest and finest is Cascar itself. The inhabitants live by trade and hand-crafts; they have beautiful gardens and vineyards, and fine estates, and grow a great deal of cotton. From this country many merchants go forth about the world on trading journeys. The natives are a wretched niggardly set of people; they eat and drink in miserable fashion."[13]

(2) Khotan:

A.

Khotan, or Hotien, is one of the largest oases in the southern edge of the Tarim basin. It is five li East of Yurunhash River adjoining Lo-pu; 580 li South of Li Men Lan I Mount,

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12. Beal, S., Si-yu-ki, or the Records of Western Buddhists, vol. II, p. 309.
13. Yule: The book of Ser Marco Polo, vol. I, p. 169.

adjoining Tibet; 250 miles West of Pe-chia-yu-li-hung, adjoining Pi-shan and 1090 li North of Tze-li, adjoining Wen-shu-fuh. It was known as Yu-tien from very early times down to Ming Dynasty. It is called Chu-sha-tan-lu in Sanskrit, Yu-tan by the Huns, Hou-tou by the Hu people, Chi-tan by the Hindus and U-then by the Tibetans. Ho-tien was the name used officially only at the time of the Tsing Dynasty.

As most of the geographical names of this region are often conveyed by meanings and interesting origins, Khotan is no exception. It has often been attributed ~~with~~ many different origins and different meanings by various writers. According to von Richtofen, Khotan or Yu-tien was a purely Chinese designation given to this region, on account of its famous product, jade, by which "于" being a slight change of "玉" meaning jade.[14] But this was opposed by M. Chavannes, a famous French sinologist. He thought that this older name, Yu-tien, was simply a phonetic transcription and has nothing to do with the transformation of the Chinese character from "玉" to "于". Personally, I rather agree with the latter. Besides, Dr. Stein thought that the name Khotan was perhaps of Sanskrit origin, and a derivation of the Sanskrit word "Kustana", which means the "breast of the earth". There is another interesting explanation for the origin of this area. It is said that the word "Ho-tien" is a transliteration of the word "Hai-tun", which, literally, in Turkish, means the Chinese or Hanese. Hence, it was deduced that this region was first settled by the descendants of a famous Chinese general, named Yen-Shan of Han Dynasty.[15] This coincides very well with the legendary

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14. Stein: Ancient Khotan, p. 155.
15. Topographical Records of Sinkiang, vol. 24, p. 5.

account, as recorded by Hsuang-tsang. But, this being simply a legend, has not been supported by historical proofs.[16]

B.

(1) In the Tsien Han Shu (202 B.C.-220 A.D.) under Si-Yu-Chwan, it is stated that the capital of Khotan or "Yu-tien-Kuo", known as "western-city" was 9,670 li distant from the imperial capital, Chang-an, now Si-an, Shensi. The total number of its population was given as 3,300 families with 19,300 people. Most interesting of all, it mentioned especially the abundance of jade in this region.

(2) Khotan as seen by Fa-hsien (400 A.D.):

Fa-hsien describes the region as a pleasant and prosperous kingdom, with a numerous and flourishing population. Especially he gives a very detailed account of the wide prevalence and the dominating position of Buddhism and its effects on the life of the people of Khotan.[17]

(3) Sung Yuin's and Hwei-sen's (519 A.D.) descriptions of Khotan:

Sung Yuin told many interesting things about the social customs of the Khotan people, while Hwei-Shen left some brief notes of great geographical interest. The latter describes the soil of this region as being favorable to "Wu-kuh" or Five Cereals, that is, rice, wheat, barley, millet, sorghum? and to mulberry and hemp. He also mentioned the wealth of jade and the good breed of horses and camels. The flourishing condition and prosperity of Buddhism was specially noted. Both of these early pilgrims reached Khotan by the way of Shan-shan (Lou-lan),

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16. Beal, Samuel: Bi-yu-ki, Records of the Buddhist World, pp. 312-319.
17. Fu-Kuo-Chi or Travel-Notes of Fa-hsien.

that is, through Lop-nor.

(4) Khotan as recorded by Tang Annals (618-907):

The Tang Annals tell us that the Kingdom of Khotan at this time included the former territories of Jung-lu, Yu-mei, Chu-leh, and Pi-shan. (They cannot be identified now). The jade from the rivers, the flourishing condition of Buddhism as well as Zorastrian religion, the character of the people were all duly recorded. Moreover, a Pei-Sha Protectorate (General or commander-in-chief) was established at Khotan by Tang Dynasty.

(5) Khotan described by Hsuang-tsang (629-644 A.D.):

Hsuang-tsang reached Khotan from the direction of Karghalik (or Sariqol or Si-Yien) in the year 644, A.D. He describes this region as: about 4,000 li in circuit; the greater part is nothing but sand and gravel. The arable portion of the land is very contracted. The latter is suitable for the cultivation of cereals, and produces abundance of fruits. The manufactures are carpets, felts of fine quality, and fine-woven light silks. Moreover, it produces white and green jade.[18] The climate is soft and agreeable. Tornados and dust storms are duly mentioned. The inhabitants are described as being mild by nature and respectful, they love to study literature, and distinguished themselves by their skill and industry. The people are easy-going, given to enjoyments, and live contented with their lot. Above all, the flourishing condition of Buddhism was mentioned in great detail. Most of his observations still hold true to the present time and

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18. Corrected by Stein as white and dark jade. Compare Stein: Ancient Khotan, p. 174 and Beal, Si-Yu-ki, vol. II, p. 309.

leave very little to be added by modern travellers to that region.

(5) Chang Kwan-yueh's description of Khotan (960-1280 A.D.):

In 940 A.D. of the Sung Dynasty, a Chinese mission led by Chang Kwan-yueh visited Khotan. In his report the following description of its general topographical conditions is found. He says: "The jade river rises in the Kuen-lun mountains, and after flowing west-wards for 1,300 li enters the confines of Yu-tien, near the mountain of the Ox-head." This locality, as identified by Dr. Stein, was to mean the Kohmari Hill, the site of a famous sanctuary on the right bank of the Kara-kash where the river enters the plains. The river of the "white Jade" is placed by this extract as "30 li to the east of the city of Yu-tien, the green jade River 20 li to the west of the latter, and the Black Jade River 7 li further to the west." According to Dr. Stein the distances of these rivers thus noted proved to be remarkably accurate.[19]

(6) Marco Polo's description of Khotan:

Khotan was visited by Marco Polo between the years of 1271 and 1275 when he was on his way to China. He told us that:[20]

> "Cotan (Khotan) is a province lying between north-east and east, and is eight days' journey in length. The people are subject to the Great Khan and are all worshippers of Mohamet. There are numerous towns and villages in the country, but Cotan, the capital, is the most notable of all, and gives its name to the kingdom. Everything is to be had there in plenty, including abundance of cotton (with flax, hemp, wheat, wine, and the like). The people have vineyards and gardens and estates. They live by commerce and manufactures, and are no soldiers."

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19. Stein: Ancient Khotan, vol. I, p. 179.
20. Yule: The book of Ser Marco Polo, vol. I, p. 174.

(3) Yarkand:

A.

Yarkand, lying at the point where the great routes from Khotan, Ladak, and the Oxus are joined by those leading to Kashgar and the northeastern part of the Tarim basin, is one of the most important commercial centers of this region. It is 104 li East to Bo-ha-chi-geh-teh and Ta-shi-ha-ma, adjoining Yieh-chen and 75 li South to I-ken-shu, adjoining Yieh-chen; 146 li West to the desert, adjoining Yangi-hissar; and 98 li north to the desert, adjoining Ba-tsu. The dimensions of this oasis are 250 li from East to West and 173 li from North to South.[21] It is known as Sha-che-kuo in Han, Chu-sha or Chi-sha in Northern Wei dynasty, and Che-chu-chia in Tang, and Yarcan in Yuan. This word, Yarkand, very possibly of Turkish origin, means a "big land". (Yar means land and "kan" means big.) It also may mean the "cultivable alluvial terrace. (Yar means ravines deeply cut into alluvial soil and "kan" or "kent" means "cultivable land" or agricultural settlement.[22]

B.

(1) In Tsien Han Shu, (202 B.C.-260 A.D.) under the Si-Yu-chwan, the capital of Sha-che or Yarkand is put as 9950 li to Chang-an, or Si-an. The population was given as 16,673 persons.

(2) It is not possible to discover much from Tang Shu about this region. But from Hsüan-tsang's Notes the following

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21. Topographical Records of Sinkiang Province, vol. 4, p. 8.
22. Stein: Ancient Khotan, vol. I, p. 87.

extracts about Yarkand may be noted:

> "This kingdom (Yarkand, he called it Cho-kui-cha) is some 1000 li or so around; the capital is about 10 li in circuit. It is hemmed in by crags and mountain fastnesses. The residences are numerous. Mountains and hills succeed each other in a continuous line. Stony districts spread in every direction. This kingdom borders two rivers (probably Yarkand and Khotan rivers); the cultivation of grain and fruit-trees is successful, principally figs, pears, and plums. Cold and winds prevail throughout the year."
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(3) Marco Polo's description of Yarkand:

> "Yarcan (Yarkand) is a province of five days' journey in extent. The people follow the laws of Mohammet, but there are also Nestorian and Jacobite Christians. They are subjected to the same Prince that I mentioned, the Great Khan's nephew. They have plenty of everything particularly of cotton. The inhabitants are also great craftsmen, but a large proportion of them have swollen legs, and great crops at the throat, which arises from some quality in their drinking water."
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(4) Kucha

A.

Kucha, known as Kwie-tze, or Chiu-tze, or Chu-tze, or Chuh-shih in the early times, is situated at the northern edge of the Tarim basin and with Tienshan at its back. It is 260 li East to La-I-shu-ho, adjoining Lun-tai, 85 li South to Hao-ku-er-chwan, adjoining Shayar; 90 li West to Ho-shi-li-keh, adjoining Shayar and 250 li North to Tai-lai-mei-ti devan, adjoining Karashar. It is 350 li from East to West and 335 li from South to North.[25] Geographically, it possesses many unique points which may be briefly summarized

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23. Beal: Buddhist Records of the Western World, vol. II, p. 306.
24. Yule: The book of Ser Marco Polo, vol. I, p. 173.
25. Topographical notes of Sinkiang, vol. 23, p. 6.

as follows:[26] First, it lies at the point where two big rivers, the Muzurt and the Kucha daira, debouch close together from the Tienshan foot-hills into the trough of the Tarim. Thus it is favored by abundant supplies of water for irrigation purposes. Second, in its general climatic conditions, it has been greatly favored by the presence of comparatively abundant atmospheric moisture from the North of Tienshan. This makes more agricultural settlement possible along its southern foothills and causes more grazing land and abundant vegetation to be found in most of its upper valleys than is usual in the Tarim basin. Thirdly, with the wide broad riverine belt of the Tarim river from the South, it is protected from the danger of drifting sand and thus is prevented from constant wind erosion and the work of irrigation and cultivation is rendered much safer than in many other regions of the Tarim basin. Fourthly, Kucha has been greatly benefited by being situated at the nodal point of many important routes from nearly all directions. Muzurt Pass at the South serves as the most important and the most commonly used pass between the Tarim basin or Tien Shan Nan Lu and Tien Shan Pei Lu (Dzungarian basin), since very early historical times. To the East, from the head waters of Kucha and Bugur rivers a road leads to the plateau-like top portion of the great Yulduz. Besides, historically, Kucha has been the nucleus of the Central Asian high road, along the southern foot-hills of Tien Shan, between China and the Oxus region and the western Asian countries. Moreover, it lies half-way between Kashgar

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26. Stein, Innermost Asia, vol. II, pp. 805-6.

in the West and Turfan in the East. And, above all, it occupies an important point in the east-west highway along the southern foothills of Tien Shan. Finally, owing to its unique geographical position, open to the attacks of various nomadic tribes from North of Tien Shan, Kucha has been considered of exceptionally great strategical importance in the historical past. In ancient times it has served repeatedly as the military base for Chinese penetration into Central Asia. Headquarters of the Anshi Protectorate of the Han and that of the "Four Garrisons" of Tang were all established here.

B.

(1) In Tsien Han Shu, (206 B.C.-220 A.D.) under the section of "Si-yu-Chwan", it is said that Kwei-tze-kuo (Kucha) had its capital at Yen-chen, which is 7480 li from Chang-an or Si-an, Shensi. It is adjoined to the south by Ching-tsueh, south-east by Cher-chen, south-west by Yu-mei, North by Wu Sun, and West by Ku-mei.

(2) In China Shu, (317-589 A.D.) the Annals of Ching, under "Si-Yu-chwan" or "Notes on Western Regions", it was noted that in Kucha, there were thousands of Buddhist monasteries and the people were enthusiastic worshippers of Buddhism.

(3) Hsuan-tsang's description of Kucha (629-44 A.D.)

> "The country of Kuchi (Kucha) is from East to West some 1000 li or so; from North to South about 600 li. The capital of the realm is from 17 to 18 li in circuit. The soil is suitable for rice and corn and also 'Keng-tao' (a rice which is not glutinous, that is, common rice); it produces grapes, pomegranates, and numerous pieces of plums, pears, peaches, and almonds, also grow there. The ground is rich in minerals--gold, copper, iron, and lead, and tin. The air is soft, and the manners of the people honest.----- In commerce, they use gold, silver, and copper coins."[27]

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27. Beal, S.: Buddhist Records of Western World, vol. I, p. 19.

(5) Karashar:

A.

Karashar, also known as Wu-I, Akini, or Shui-yeh, in early historical times, is now officially called Yen-chi. It is 340 li East to Chiu-Fan-chwen, adjoining Turfan; 230 li South to Er-li-chi-ken davan, adjoining Sin-ping; 365 li West to Kan-kou, adjoining Lung-tai; 555 li North to Tseh-devan, adjoining Chang-chih and Shui-lai or Manas. It is 705 li from North to South. Geographically, Karashar possesses many unique characteristics which are different from other areas of the Tarim basin.[28] In the first place, the presence of the great lake, Bagrash-kol, which, according to the survey of Roborvosky, extends with its marshy edges, a distance of over 50 miles from East to West with a maximum width of about 30 miles, makes this region in many respects different from the other oases of the Tarim basin. This lake is full of fresh water and therefore provides abundance of water for irrigation purposes. Secondly, the climate of this region, as recorded by Dr. Stein, is much moister than that of the oases along the northern edge of the Tarim basin or to the South of Taklamakan. Wide belts of vegetation are therefore found encircling the Boghrash Lake and its adjacent areas. Thirdly, with the wide range of grazing land in the Yulduz Valley, it has in past historical times repeatedly attracted raiding nomadic tribes from the North. Concerning this, as Dr. Stein has rightly remarked: "Situated as Karashar is at

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28. Stein: Serindia, vol. III, p. 1178-79.

the very mouth of the big valley leading down from Yulduz, it must have been like a gate specially inviting those who had their favorite summer camps on those grassy plateaux and necessarily looked to the oases on the South as their richest grounds for raids and extractions."[29] Finally, in spite of the good facilities for irrigation and the available space for cultivation, it is found by many travellers that agriculture has been practiced only in part of Kara-shar while ~~the~~ a large portion of its land ~~has been~~ is still used for grazing purposes. This is mainly due to the population. A major portion ~~of~~ ~~this~~ of the population is Mongol, together with some Tunganis and a few Turki-Mohammedans; they still enjoy and retain their traditional nomadic practice and are very reluctant to adopt agricultural life. So it has often been said that this region, Karashar, is the dividing line or transitional zone, between the nomadic culture in the North or Dzungaria and the agriculture-culture in the South or Tien Shan Nan Lu.

B.

(1) In Chien Han Shu, (202 B.C.-220 A.D.) under the section of Notes on Western Regions, it is recorded that Yen-chi-kuo (Karashar) is near a big sea (Bogrash-kol) and fish of various kinds are found.

(2) Karashar, as described by Fa-hsien (400 A.D.):

Fa-hsien visited Karashar in 400 A.D. from the side of Shan Shan or Lou Lan. This region was called Wu-I by him. An abundance of irrigation works, fertility of soil and climate were all duly recorded.

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29. Stein: Serindia, vol. III, p. 1181.

(5) Tang Shu's notes of Karashar (618-907 A.D.):

Karashar was known as Yen-chi-kuo in Tang Shu. Its population was given as 4,000 households. Strong influences of the Turks in this region were also noted.

(4) Hsuan-tsang's note on Karashar (629-44 A.D.):

> "The kingdom of O-ki-ni (Karashar) is about 500 li from East to West, and about 400 li from North to South. The chief town of the realm is in circuit 6 or 7 li. On all sides it is girt with hills. The roads are precipitous and easy of defense. Numerous streams unite, and are led in channels to irrigate the fields. The soil is suitable for red millet, winter wheat, scented dates, grapes, pears, and plums, and other fruits. The air is soft and agreeable; the manners of the people are sincere; and upright----- In commerce, they use gold, coins, silver coins, and little copper coins."
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(6) Turfan

A.

Turfan, known as Chie-shih-chien-kuo or Anterior Chu-shih or Kushi in Han, Kao Chang in Northern Wei and Sui, and Hsi-chao in Tang, is situated at the most eastern point of the Tarim basin. It is a depression with an average of 300-400 feet below sea-level. It is 90 li East to Shen-ching-tai, adjoining the Lien-mu-sin of Shan-shan, 200 li South to Pei-sha-pu-lu-keh-shan, adjoining the Lop-nor near Charkhilik; 420 li west to Ku-mu-shih, adjoining the Yu-shu-kuo of Yen-chi or Karashar; 90 li north to Mu-tao-kuo, adjoining the Chuan-Tze-kai of Fu-yuan.[31] The dimensions of this oasis are 510 li from East to West and 290 li from North to South.

Owing to its unique geographic position, Turfan has served

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30. Beal, S. Buddhist Records of the Western World, vol. I, p. 18.
31. Topographical Notes of Sinkiang, vol. 2, p. 3.

as the gate of the "Western Regions" or the Tarim basin and has played a very important part in the historical past. It has been a center of great dispute where both the Huns and the Chinese competed to gain control of a military base for their penetration into the Tarim basin.

B.

(1) In the Tsien Han Shu, under the section of si-yu-chwan", it is stated that the capital of the kingdom of Anterior Chuh-shih (Turfan) is the city of Chiao-ho. The city is 8,150 li distant from Chang-an (Si-an), Shensi. The kingdom contains 700 families with a total population of 6,050 persons.

(2) Turfan, as recorded in Wei Shu and Cheo Shu of Pei Shih (317-589 A.D.):

Under the Kaochang-Chwan of Wei Shu, it states that there are eight cities in Kao-chang, that is Turfan, and Chinese inhabitants are found in all of them. The climate is described as warm and the soil fertile. Irrigation works are numerous and fruits of various kinds are cultivated.

Under the section of "Yi-Ruh-chwan" or Notes on "Foreign Countries", of Cheo Shu, special mention is made of the desert route between Tun-hwang and Turfan. It says that this desert route between Tun-hwang and Turfan has no clearly defined track and can only be traversed by the sign of skeletons of men and animals and the bones of camels and horses. There are also ghosts and bad spirits on the way, so that most of the travellers took the route of I-wu, that is, Hami. This probably refers to the present "Tsieh-Chine-fan", a place near Turfan, where strong dust-storms constantly occur.

(3) Turfan, as described by Tang Shu (618-907 A.D.):

Under the Kao-chang-chwan of Tang Shu it is stated that Kao-chang (Turfan) is over 4,000 li from North to South; it comprises 21 towns; the king has his capital in the town of Chiao-ho, which was also the site of the court of the king of the Anterior Chu-shih at the epoch of the Han; the town of Tien-ti was the administrative seat of Wu-Chi-hsiao-wei. The soil is fertile; wheat and cereals are produced. There are two harvests every year; there is a plant called Po-tieh (that is, cotton). The people pick its flower and spin cloth out of it.[32]

(4) Turfan, as described by Wang-yien-teh of Sung Dynasty (960-1280 A.D.)

In his book titled "Travel-notes at Kao-chang", Wang Yien-teh of Sung Dynasty makes many interesting remarks concerning this region. The extraordinary aridity, the excessive heat in the summer which made the people dig holes in the ground in which to live (the people still practice this habit, as observed by the author himself when he was there in the summer of 1933) and the fondness of the people for music were all duly recorded.

3. A brief resume of the past economic (agricultural) pattern of this region:

From the earliest Chinese record concerning this region, the Han Annals (202 B.C. to 220 A.D.) we learned that agriculture and sericulture was then practiced in this region. This has also been verified by the recent archeological findings in this region, mostly in Niya, Miran, Loulan, and

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32. Tang Shu, section on Kao-Chang-chwan.

many other ancient abandoned sites, as discovered by Dr. Aurel Stein, Sven Hedin, and several other famous geographers during the last few decades. Fa Hsien of Chin dynasty, 400 A.D., has definitely told us that wheat was grown in Karashar and Aksu at the time of his visit. Sun Yuin, in 519 A.D., during his stay in this region, informed us that "Wu-kuh" or five cereals (including rice, wheat, barley, millet, and sorghum?) were produced in Khotan. If this record of Sun Yuin is accurate and did include sorghums, we are greatly puzzled why this crop, sorghum, to our best knowledge, is not found in this region today if it succeeded well in the past. Again, most interesting of all, in Tang Shu (the Tang Annals 640, A.D.) it is recorded that cotton, known as "pei-tieh-tze", was cultivated at Turfan. This leads to a very interesting point in connection with the history of the dissemination of plants in China which has formed one of the most strong arguments in supporting the parallelism-theory of the dissemination of cotton in China. In general, it has been recognized by most of our geographers and cotton experts that cotton was not cultivated in China until 1000-1100, A.D. If cotton were produced in this region as early as about 640 A.D., four or five hundred years earlier than that of China, then this mono-center theory of South-China origin of cotton, that is,--all Chinese cotton has been originated from South China--does not hold true. Evidently, we can say that cotton-plantation in China has been disseminated from two centers, one from the South and one from the West, that is, from this region, the Tarim basin. Again, we can assume in all probability that cotton of North-west China, owing to

its geographic proximity to this region, must have been disseminated from the Tarim basin. Hsuan-tsang, known as the most accurate observer of the early days, has, in 640, duly recorded the wide cultivation of cereal crops and the predominance of orchards in this region. Marco Polo, in 1274, when he passed this region into China made special mention of the wide cultivation of cotton in Kashgar, Khotan, and Yarkand. In conclusion, after reviewing the most authoritative and reliable historical records available before us and sizing up the agricultural pattern of this region at present, it is safe to conclude that the general agricultural pattern of this region today, with the exception of the recent introduction of some vegetable crops, such as tomatoes, cabbages, the American up-land cotton, and potatoes, seems to be very little different from that of the very early days--I mean the Han dynasty (202 B.C.-220 A.D.).

Chapter IV

The Peoples

1. Theories concerning the primary racial stocks who first inhabited this region

It has often been said that Central Asia, including Sinkiang province (comprising both Tien Shan Nan Lu and Tien Shan Pei Lu), is the original habitat of the human races. Especially, the latter, Sinkiang, which is often alleged to be the melting-pot of human races, is of great interest to modern anthropologists as well as to geographers. As to the question of the racial stock of the first settlers in this region and the origin of the inhabitants now living in it, opinions differed widely. Some of the modern ethnologists and anthropologists propose that this region was originally inhabited by Aryan stocks and later, in the early part of the present era, that races of Mongolian origin appeared. They either drove out the aborigines or mingled with them and then formed the major part of the population now inhabiting the region. Again, many others suggest that strong "Alpine" elements have also been found in the present population. But, in view of the lack of a careful and scientific survey no definite conclusions can at present be drawn in this connection.

Nevertheless, aside from the problem of their racial origins, the peoples now inhabiting the whole region may be generally divided into two groups: The settled or urban peoples of the plains, and the nomads of the hills and mountain tracts. In the former, the Chinese, Tunganis, Turks or Sarts, Solons and Sibos, and Dulains may be included.

Secondly, in the nomadic groups, we find the Kighiz, Kazaks, Mongols, Tajiks, etc. For the present purpose, the discussion will be confined to those peoples who are now mainly inhabiting the region, the Tarim basin or Tien Shan Lan Lu. But, for the Tunganis, although they have their habitats mainly in Tien Shan Pei Lou and strictly speaking, do not constitute an important portion of its population, I should like to make an exception and say a few words about them. This is because of the important role they have played in the history of this region during the last 100 years.

2. Principal racial stocks:

A. Turki-Mohammedans:

The Turki-Mohammedans[1] or Chang-hui, or Chang-tou or Turbaned Mohammedans or Sarts, for they are known by many names, are generally said to be the direct descendants of a Turki tribe, called Uigurs, who in turn were said to be descended from the Hsiung-nu[2] or Huns. The Turki-Mohammedans are found everywhere in the oases of the Tarim basin and constitute the main elements of its population, approximately 85% of its total population. Racially, their distinguishing features are broad face, heavy beard, reddish or brown hair, big stature, and black or sometimes blue eyes. Strictly speaking, as a result of the confusion of blood resulting from the invasions of many different peoples, they are not pure Turkis. Some say that they have very strong "Alpine" elements in them

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1. In Tien Shan Pei Lu, especially in Ili valley, there are also many Turki-Mohammedans, known as Taranchis, who were removed by the Imperial edict of Chien Lung in the latter part of the eighteenth century.
2. Chiu Tang Shu, Notes on Uigurs.

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and many others note that Tibetan, Mongolian, and Arabian characteristics are also found. Mr. Joyce, an English anthropologist, after analyzing the data collected by Dr. Stein, made the following remarks concerning the racial origins of the peoples of Khotan and Keriya. He says:

> "Both (the peoples of Khotan and Keriya) are, in the main, of the so-called 'Aryan' stock, the chief factor being Lapouge's Homo Alpinus. There is, however, in each case an admixture of Turki blood and a further admisture of Tibetan. The latter appears to be stronger at Keriya than at Khotan, and at the same time here Mongolian influence begins to make itself felt."[3]

Besides, according to Dr. Stein, in peoples of the northern oases like Kashgar, Aksu, Kucha, which are within reach of the Kirghiz grazing-grounds in the valleys of the Alai and TienSahn, the Turki blood infusion is much stronger than in Khotan.[4]

B. The Tunganis:

The Tunganis, or Han-huo, or Chinese-Mohammedans, or Hui-hui, are said to be also related to the Uigurs. In the Tang Dynasty, the Uigurs with the support of the Arabians, who were a very powerful nation of Central Asia at that time, had sent their army to Kansu province and northwestern China to assist the Emperor of Tang to fight against the Turks. These mercenaries afterwards settled in China, marrying Chinese wives and becoming assimilated in various degrees with the civilization of China. This word, Tunganis, is said to be derived from the Uigur word "Tongumek", meaning

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3. Journal of the Anthropological Institute, 1903, vol. 33, p. 320.
4. Stein, Ancient Khotan, P. 147.

to return or convert; the Chinese word, Hui-hui, as Mohammedans are now known in China, is, according to many authorities, most likely a phonetic transcription of the Chinese pronunciation of the word "Uigur". In Sin-kiang, they have their main habitat in Tien Shan Pei Lu, especially in Manas or Shui-lai, but a considerable number of them are also found in Tien Shan Nan Lu, notably Karashar. The total number of them in the whole province of Sinkiang is given as about 400,000.[5] In general physical features they look very much like Chinese, but they are typified by full noses and broad faces. Although in many respects of their life they do become assimilated with the Chinese, still in many phases they persistently retain their own modes of living. For instance, in the general marriage and funeral rites, the ways of preparing foods, and many other social customs, they are radically different from the Chinese. Besides, instead of Chinese, Arabian or Persian became their prevalent languages. Most of their children refused to learn the Chinese and regarded it as a heathen language. They retained by force of their religion a very strong sense of racial difference from the true Chinese. As a race, they possess greater virility and are of a much higher martial ability than the average Chinese. Most of them are traders. Some are engaged in agricultural pursuits.

C. The Kirghiz:

The Kirghiz, also known as Ha-Ha-tze and Kara-kasaks among the Chinese and Russians respectively, is a large nomadic tribe inhabiting this region. They have two main divisions, known as the "Left" wing in the West and the Right

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5. Report of the Commission on the Reconstruction of Sinkiang, 1934, p. 6.

wing in the East. The former are found chiefly on the Russian and Chinese Pamir, and the latter near Issiq Kol and on both sides of Tien Shan. In the Tarim basin, they are especially populous in Sariqol, Yarkand, and Uch Turfan. In their general mode of life, being mainly nomadic, they are more akin to the Mongols, but in recent years, some of them have changed their nomadic occupations and begun to settle down. In the Valley of the Tush-kan-daira above Uch-Turfan many of them are found as cultivators. Religiously, like the Turki-Mohammedans, they are very faithful Mohammedans. As to the racial origins of the Kirghiz, very little is known.[6] Physically, they are very strong and are good fighters. The total number of them is estimated to be about 200,000 persons.

D. The Dulans:

The Dulans are a people of controversial origin. There is a legendary saying that their name was given them by a Khodja monarch, who termed them his dulan, that is, "two shoulders". Some people say that they are of genuine Turkish extraction or pure Uigur types, while others suggest that they are the descendants of Mongols. There are still some who say that they are Kirghiz and of Indus origin. They form a portion of population which is entirely different in stock from those living in the other oases of this region. But, in speech, racial types, and general mode of life they look very much like the Kirghiz. They were originally a semi-nomadic people but recently have begun to settle down and to practice

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6. A popular legend in the Tarim basin about origin of this people says that they were descendants from forty maidens--Qirq Qiz, or forty daughters. Some said that these forty maidens became with child by the foam of Issiq Kol and some said that they became pregnant and gave birth to children by coagulation with a red dog.

agriculture, but, on the whole, they now rely more on their flocks than on the produce of the land. The total number of this group of population is rather small. They are found only along the Yarkand River from above Maralbash to Aksu, with their chief town at Merket, about 40 miles of Yarkand River. It has often been said that the Dulan women are well-known for their remarkable beauty and are vivacious in the south European manner.[7]

E. Tajiks:

The Tajiks, sometimes known as Sariqolis, are also a people of Turkish origin. They have their chief habitat in the extreme South of the Pamirs, that is, in the Sariqol district or Pu-li. They are said to be the purest specimens of the original "Alpine" stock who have lived in this area since the dawn of history.[8] They are semi-nomadic although some of them have started to practice agriculture. In religious life they resemble the other Turki-Mohammedans. The total number of this population is estimated to be about 13,000 souls.

Thus far we have reviewed very briefly the main types of people inhabiting the Tarim basin. But, in addition, there are people of minor importance and small numbers, such as, Persians, Afghanistans, Indians, Russians, Tartars, Turki-Mohammedans from the other parts of Central Asia and Russian Turkestan, and so on. The population element of this region is so complicated and diverse that at one time in the "yamen" of Kashgar or head-quarters of the Chinese officials in Kashgar there were provided interpreters of nine different kinds of

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7. Skrine: Chinese Central Asia, p. 123.
8. Ibid., p. 41.

languages in order to deal with troubles arising among its diverse populations.

In summarizing the population-situation of the Tarim basin, Mr. Lattimore in his recent article on Sinkiang, has finely remarked: "In general, the Aryan-alpine type is strongest on the Southern and Western sides of the Takla-makan, with Turkish characteristics becoming more marked toward North and East."[9]

Characteristics of the Turki-Mohammedans

Writers on this region are unanimous in describing the Turki-Mohammedans as being a people of unenterprising, good-humored, obedient, unwarlike, and cowardly nature. E. Huntington gives us this brief quotation about them: "among the good qualities," he says

> "are gentleness, good temper, hospitality, courtesy, patience, contentment, democracy, religious tolerance and industry. Among the bad are timidity, dishonesty, stupidity, provincialism, childishness, lack of initiative, lack of curiosity, indifference to the suffering of others and immorality. It is noticeable that strong characteristics whether good or bad, are absent. Determination, courage, aggressiveness, insolence, violence, fanaticism, and the like are almost unknown among the Chantos (Turki-Mohammedans)."[10]

Although in many respects, especially regarding his mention of such qualities as "dishonesty", "immorality", etc., the author as a result of his long association with them during the last few years, cannot agree with Mr. Huntington. But the author believes that on the whole Mr. Huntington has given a pretty fair picture of these people. Nevertheless, in

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9. China Yearbook, 1934, p. 82.
10. Huntington, Pulse of Asia, pp. 158-40, 229-235.

discussing such topics as nature or qualities of a race or a people, it should not be forgotten that one cannot say that these qualities or characteristics are innate or in-born in nature and cannot be changed. Again, too much generalization is dangerous. For instance, such qualities as timidity, lack of initiative, and so on are all merely results of environment, both physical and cultural. Being geographically isolated, they are completely shut off from contact with the cultural world outside. Again, with the condition of under-population, there is no sharp competition among these people. Thus, they have never been driven to exertion and therefore, they are prevented from developing their innate abilities. The author, through his long contact with these people, firmly believes that so far as innate abilities are concerned they are by no means inferior to any other racial stock so far as he knows. If equal chances and favorable environment are granted to them, the author believes that they can accomplish just as much as any other people in the world.

3. The Population of this region:

In order to show the general trend of population development of this region, a contrast of past conditions with the present is perhaps helpful. According to the record of the Annals of the Han Dynasty, the total number of population and their geographical distributions may be tabulated as follows:

Population of various kingdoms in "Western Regions"--only for Tien Shan Nan Lu and Tien Shan Pei Lu--as recorded by Han Annals:[11]

Name of the kingdom	No. of families	No. of persons
1. Charkhilik	450	1,750
2. Shan-shan	1,570	14,000
3. Cherchen	230	1,600
4. Siao-wan	150	1,500
5. Ching-tsueh	480	3,360
6. Yun-luh	240	1,610
7. Yu-mei	2,340	20,040
8. Chu-leh	310	3,170
9. Yu-tien	3,300	19,300
10. Pi-shan	500	3,500
11. Sih-yien	350	4,000
12. Pu-li	650	5,000
13. I-nai	125	671
14. Wu-lui	1,000	7,000
15. Yarkand	2,339	16,373
16. Su-leh	1,500	18,647
17. Wei-tou	300	2,300
18. Ku-mei	3,500	24,500
19. Wen-suh	2,200	8,400
20. Kwei-tze	6,970	81,317
21. Wu-tieh	110	1,200
22. Tsu-li	130	1,480
23. Wei-li	1,200	9,600
24. Wei-shui	700	4,900
25. Yen-chi	4,000	32,100
26. Wu-tan-tze-li	41	230
27. Pei-luh	227	1,387
28. Pei-luh-heo-kuo	462	1,137
29. Yu-lih-shih	190	1,445
30. Shan-shan	27	190
31. Pu-lai	327	2,023
32. Pu-lai-heo-kuo	100	1,070
33. Tung-chia-mei	191	1,948
34. Si-chai-mei	332	1,926
35. Tsieh-kuo	99	500
36. Hu-hu-kuo	55	264
37. Shan-kuo	450	5,000
38. Chuh-shih-cgien-kuo	700	6,500
39. Chuh-shih-heo-kuo	595	4,774
40. Chuh-shih-tu-wei	40	333
41. Chuh-shih-heo-chang-chen	150	560
Grand Total	39,360	316,274
Average for each kingdom	960	7,714

11. Tsien Han Shu, section on "Si-yu-chwan" or "Western Regions".

In the above 41 nations, which include both the regions of Tien Shan Nan Lu and Tien Shan Pei Lu, the total number of families was 39,360 and the total number of persons, 316,274. Most interesting of all, we find the average population of each of the so-called nations in both Tien Shan Nan Lu and Tien Shan Pei Lu as a whole was only 960 families and 7,714 persons. Strictly speaking, these are no nations but simply enlarged tribes.

Owing to the lack of census for this province as a whole, no accurate figures of the present population can be given. Estimates vary greatly from different sources. The total population for the whole province of Sinkiang is estimated to range from 2½ million to 6 million souls.

According to the estimates of the Chinese Post Office, published by the Republican Government, in 1923, the total population of this region, including Tien Shan Pei Lu, was given as follows:

Post Office estimate of population of each Hsien Administrative area of Sinkiang (1920):[12]

Name of the district	Total no. of population
1. Chang-chi	16,217
2. Chen-hwa-hsi	4,730
3. Chen-hsi	9,278
4. Chinnimu	4,400
5. Chohchiang (Charkhilik)	4,646
6. Fu-kang	5,922
7. Fu Yuan	7,350
8. Hami	14,795
9. Hoerhkwoszee	2,696
10. Hotien	216,174
11. Hwei-yuan	22,498
12. Kaishi	76,560
13. Kitai (Kuchen)	50,142
14. Kucha	46,635
15. Loh-pu	197,750
16. Lun-tai	21,084
17. Nien-yuan	116,250
18. Ba-tsu	56,889
19. Bai-chen	14,580
20. Pi-shen	65,039
21. Puertsin-ho	3,430
22. Pu-li	9,899
23. Shan-shan	81,160
24. Sha-wan	4,055
25. Shaya	3,691
26. Shu-fu	249,996
27. Shu-leh	7,572
28. Sin-ping	6,335
29. So-che (Yarkand)	243,520
30. Su-lai	27,971
31. Sui-ting	54,166
32. Ta-cheng	14,514
33. Tieh-hwa	63,849
34. Tsing-ho	4,862
35. Turfan	112,518
36. Wen-suh	67,706
37. Wen-suh-loh-chen	51,275
38. Wu-sih	62,508
39. Wu-su	5,333
40. Yangihissar	128,096
41. Yieh-chen	157,549
42. Yen-chi	54,988
43. Yu-tien	150,951
Grand Total:	2,519,579 persons.

12. China Year-book, 1923, p. 11.

Recently, another estimate appeared in the Chinese Economic Monthly, Vol. XIX, which gives the total population of the whole province as 3½ millions, of which 50% are said to be Turki-Mohammedans, 15% Tunganis, or Chinese Mohammedans, and the rest are distributed among the Kasaks, Kirghiz, Mongols, Chinese, etc.

Again, it is unfortunate that even among the most competent authorities of this region, the estimates regarding its population have shown very wide discrepancies. For Khotan, for instance, the population of that region was given in 1873 by Forsyth as 129,500 persons,[13] in 1885, by Przevalsky, the famous Russian explorer, as 160,000 and in 1890, by Sven Hedin as 524,000, by Stein, in 1902, as 226,000, by Sykes, in 1920 as 190,000 and recently, a famous Mohammedan writer, Mamusted, gives the present population of Khotan as 460,000. In this case, however, the time element may be the cause of such wide differences. But it is still hard to say which of these comes nearest to the truth.

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13. Forsyth, Yarkand Mission Report, p. 62.

Chapter V

Economic Geography of the Tarim basin..

1. Production of goods.

A. Agricultural Products.

Although it is situated in a great barren desert, the Tarim basin is extraordinarily rich in all sorts of natural resources. There is a local proverb saying that you can get anything out of this region except milk from chickens. Especially is it abundant in agricultural produce.

As to the types of crops, cereals, vegetables, and fruits of all varieties are produced, even with much better quality. Important vegetable crops are wheat, maize, millet, rice, cotton, barley, lucerne, clover, peas, hemp, linseed, etc. Among them, wheat occupies the highest acreage and maize the second. Rice of Aksu is particularly well-known for its high quality and its big grains. According to the report of the Bureau of Statistics, National Government of China, the total acreage and production of the important crops may be tabulated as follows:

Table showing principal crops, total ~~acreage~~ area[1] and production of Sinkiang (1930).

Crop	~~Acreage~~ Area (Mow)	Total production (Ching)
Wheat	4,710,000	762,066,000
Maize	2,638,000	592,789,000
Rice	1,676,000	369,000,000
Kao-liang	747,000	158,316,000
Wan-bean	440,000	63,160,000
Millet	334,000	45,484,000
Soy-beans	149,000	19,976,000
Other legumes	8,000	949,700
Grand Total	11,338,000 (How about 1/6 of an acre)	2,411,893,000 (Ching about 1½ pound)

1. Reports of the Statistical Bureau, 1931.

Other Crops:		
Cotton Crop	~~acreage~~ area (Mow)	Total production (Ching)
Cotton	850,000	21,184,000
Tobacco	18,000	3,665,000
Hemp	224,000	42,554,000
Grand Total:	1,092,000 Mow	67,402,000 Ching

Silk Production of Tien Shan Nan Lu[2]
(1914)

District	Total amt. of cocoons (Ching)	Total amt. of raw silk (Ching)
1. Lo-puh	507,956	367,906
2. Khotan	366,000	127,642
3. Pi-shan	196,120	117,140
4. Yeih-chen	70,500	20,250
5. Yu-tien	34,345	1,256
6. Yarkand	30,550	5,430
7. Aksu	19,634	4,100
8. Lun-tai	16,400	1,872
9. Kucha	9,200	1,300
10. Kara-shar	5,995	1,005
11. Shan-Shan	3,500	818
Grand Total	1,260,000 (Ching)	648,719 (Ching)

Of the fruits, apricots, grapes, peaches, melons, figs, plums, pears, apples, and cherries are planted with great success. Seedless grapes from Turfan, especially in Tuyog Valley, and melons of Hami are of exceptionally good quality and are well-known everywhere in this region and in Inner China. Brandies and seedless raisins made from Turfan grapes are also well-known everywhere in this country. There was a local

2. Chinese Economic Journal, 1915, no. 109.

proverb saying:

Turfan ti pu-tao (grapes)
Hami Kua (melons)
Kuche ti yang-ganz (girl)
I-chi-hwa.

(Meaning: Turfan for grapes and Hami for melons;
The girls of Kucha are all like flowers.)

These two things, together with the jade from Khotan and horses from Karashar formed the most highly prized tributes and delicacies in the Imperial Courts of China for many thousands of years. In Kurla, there is a peculiar variety of sweet yellow pear, known as "Nashit" among the natives, which melts on the tongue, and is especially famous. Fruits of this region are so well-known and orchards so commonly found that they have attracted the attention of every modern traveller there. Even in the early part of the seventh century, at the time of Hsuan-tsang, the famous Chinese Buddhist traveller, this was true. He mentioned time and again the beautiful orchards and plentiful fruits of this region in his monumental work.[3]

Fruits are sun-dried and preserved and are eaten at odd times by the natives. Melon preserve is also made by cutting strips, which after being dried in the sun are braided into flat round cakes. Fruits are also served as a very important part of the diet of the people. It has often been said by the Chinese that at Turfan the natives did not cook for three months in the year and their food depended on the eating of a special kind of fruit, called "Shan-ko" or "mulberry-berries."[4]

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3. Beal, Si-Yu-Ki or Buddhist Records of the Western Regions, vol. 1, pp. 307-16.
4. Topographical Records of Sinkiang, vol. 2, p. 4.

Of the trees, willows, poplars, and mulberries are widely planted. The first two were used mainly for fuel and the latter for feeding silk-worms.

Cotton of specially good quality is regarded as the best paying crop. It is here the American up-land cotton was first transplanted by the Russians during the time of the American Civil War, and achieved wonderful results.[5]

B. Natural Resources and manufacturing

a. Mineral resources

Unfortunately, owing to the lack of accurate scientific surveys, our present treatment of mineral resources can not be said to be complete. Most of the present materials are based upon the Special Reports of the Geological Survey of China in 1929-31 and the fragmental observations of various competent travellers to this region.

Among the minerals which are so far known and have been exploited to a considerable extent, though with very primitive methods, the following may be mentioned:

(1) Gold and its producing areas

Gold of this region is of two kinds: the vein gold and the placer gold, the latter being comparatively of more importance. The vein gold producing areas are found in the Ah-lah-tah-shih ~~Mont.~~ mountain of Keriya, Ah-pu-kan peak of Karashar, Boh-er-ku-swen Shan of Turfan, Kopa region near Cherchen and so on. Placer gold producing areas are found around Khotan, Keriya and Cherchen. Of the placer gold important producing areas are at Surghak on the Keriya River 45 miles East of Keriya, ~~Rivers~~, at Kopa, 25 miles South of Keriya River, and

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5. Lattimore, Owen: High Tartary, p. 166.

at Chol-lan-kuu-shan are the most important. At Ak-tagh, about four days march by cart south of Yarkand, larger bodies of placer gold are also found. Besides, there are five other main gold placers known in Khotan and Cherchen, vis.: Ah-ha-toh-keh-shan, Sheo-bo-shan, Mei-tsan-shan, Tsao-li-wah-keh, and Tasi-loa-wah-keh. All these gold resources are so far being exploited and controlled by the "Chin[illegible]-ko-chu" or the Gold-mining Bureau established by the Provincial Government of Sinkiang. The methods used for gold extraction, both for placer washing and ore mining, are very primitive. In his visit to one of the gold ore mines at Kopa near Cherchen, Sven Hedin has remarked: "The auriferious rock lies at a maximum depth of 300 feet. To get down to it, the mines dig a shaft and at the bottom of the shaft excavate narrow tunnels, like mole-runs in a direction parallel to the red river bed."[6]

The annual output of gold, including both the Mountain and placer golds, is estimated to be averaged about 12,000 taels for the years 1929, 1930, and 1931.[7]

So far the gold-mining industry has been far from successful in this region. Not only was this because of the primitive means applied but the general scheme of mining management has also been very inefficient. The gold-mining laborers were compelled by the government to go into the mountains to work, almost like slavery. Many of them regarded this as a "criminal punishment" and refused to go. They tried to escape if possible. Many tragedies occurred as a result of this inhuman "slave-driving" method for securing

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6. Sven Hedin, Through Asia, vol. I, p. 908.
7. T. F. Hou: General Statement on the Mining Industry, 4th issue, 1929-1931, p. 146.

mining labor. For a detailed account of this, the reader is referred to the complete and vivid description given by the "Topographical Records of Sinkiang,"[8] under the chapter on Industry.

(2) Jade and its producing areas:

Jade has been extracted in this region for thousands of years past. As early as in the ~~Si~~ Shih-Ki of Shih-Ma-~~kien~~ Chien of the Former Han Dynasty, jade-mining was mentioned. It is found mostly in the micaceous and horn blendic schists of the Kuen-Lun mountains. The main producing areas are in Khotan and Keriya or Yu-tien, where the jade is carried down in lumps and pebbles of varying sizes by the famous "jade rivers", Kara-kash, Yurung Kash, and Keriya rivers. Besides, small quantities have also been found in the region of Yarkand. Jade has been found in early historical times, as well as at the present, as the most important article of trade in this region. It is by this precious mineral that the Tarim basin, and especially Khotan, has become widely known in the world. Jade-mining also is controlled by the Provincial government, its prices being fixed by the latter. As to the exact amount of production no data are available.

(3) Copper and its producing areas:

As early as in the "Former Han Annals", we find copper production in Aksu (or Ku-mei) mentioned. Copper is one of the most extensively exploited minerals of this region. Owing to the lack of modern methods, the annual production is reported to be only around 40,000 lbs. The main producing areas are at Anbash, on the Muzart River, 70 miles north-east

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8. Topographical Records of Sinkiang, vol. 29, pp. 7-8.

of Aksu; Kanjigan, northwest of Kashgar, and the Kur-tai-shan in the south-east of Karashar. Baichen, a city near Aksu, with several big copper mines, was the center of copper-mining industry. But, due to poor management, they are all closed now. There are also copper mines North of Kucha. Most of the ores mined there are reported of excellent quality.

(4) Lead and its producing areas

Lead is also a mineral commonly found in the Tarim basin. The producing areas are in Mei-tze-Oh-I-shan about 300 li north-west of Kashgar, Ha-Lo-Pu-lo-keh, 160 li North of Kai-shih, U-keh-shih-shan 300 li north-west of Uch-Turfan, Ku-Lu-keh-tah-hah-shan 260 li South of Uch-turfan, and Ehr-Tsih-shan south-east of Karashar. The first three mentioned mines have been in operation for some time and the quality of lead is reported to be pretty good.

(5) Petroleum and its producing areas

Among all the local minerals, petroleum is said to have the most promising future. It is not only plentiful in quantity, but also of excellent quality. The producing areas so far known are: Shan-Oh-puh, about 100 li south-west of Yarkand, Tah-lah-keh, about 100 li north-east of Wen-suh, Eh-lo-so-lun, 90 li North of Kucha, and Kanjigan, 40 miles west of Kashgar. Besides, another big source of petroleum is reported to be found in the southern part of Yen-chi or Karashar, extending in a north-south direction for about 120 kilo-meters.[9] Most of these mines of petroleum are either not exploited by modern methods or completely untouched at all. But the quality of oil produced is said to be excellent,

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9. Chang-yin-tang: The economic Development and Prospects of Inner-Mongolia, p. 131.

notably that produced in Kanjugan, near Kashgar. In 1918, Mr. Etherton, then British Consul at Kashgar, took a sample and submitted it to a Swedish oil expert. It was reported later that its quality is almost equal to the best oil and petroleum of Europe or America.[10] The total amount of production is estimated to average 300 barrels (with 42 gallons) annually for the years 1929, 1930, and 1931.[11]

(6) Coal and its producing areas

Coal is found in Kanjigan, near Kashgar; in the Kara-rash Valley South of Yangi-hissar; and also in areas around Aksu. The amount of production is unknown. The quality is not very good and it is used only for native consumption.

Finally, other minerals such as silver, iron, antimony, sulphur, mica, ozokerite, alum, gypsum, natural salt and so on are also found in many parts of this region.

As to the geological periods, geological structures, and the probable reserve of these minerals, so far no systematic survey has ever been made--except for a little work by the Russians.

b. Manufacturing

As to its manufactures, nearly all articles are made by hand. Factories of modern type are completely lacking. The only ones are the Soviet Cotton and Wool cleaning establishments in Kashgar.[12] Generally speaking, for these local hand-made industries, Khotan and Kashgar are well-known for silk-goods, woolen felts and carpets, and paper-manufacturing

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10. Etherton, In the Heart of Asia, p. 287.
11. T. F. Hou, General Statements of Mining Industry, 1929-31, 4th Issue Nat. Geol. Survey of China, p. 113.
12. Violet Conolly, Soviet Econ. Policy in the East, 1933, p. 120.

(mainly in Guma at Khotan); Yarkand, Kucha, and Karashar for leather-manufacturing; Kashgar, Turfan, Khotan, Yarkand and many other places for coarse-cotton textiles; and Aksu is especially famous for its metal works. Most of these local industries have been long known from early historical times. Among many of the works by travellers on this region, most of these local industries have been duly recorded. For instance, in his famous work "Si-yu-ki" Hsüan-tsang has given many very interesting descriptions about all local industries of this region.[13]

2. A brief survey of trade conditions of the region[14]

Prior to the modern development of marine transportation, Sinkiang, including both Tien Shan Nan Lu and Tien Shan Pei Lu, has for many centuries served as the connecting-link of trade between China and the Occident. Even up to the present, regardless of the loss of geographical position as the connecting-center for the early trade on land, the trade relations with all the neighboring regions such as Inner China, Russia, India, and other parts of Central Asian countries have been kept going on uninterruptedly. In order to secure a clear picture of her trade conditions a separate discussion of her trade-relationship with each of the said adjacent areas is helpful:

A. Trade with Inner provinces of China:

It is interesting to note that as early as in the Han dynasty the first Chinese expedition into Central Asia,

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13. Beal, "Si-Yu-Ki", pp. 304-16 for detailed descriptions.
14. Owing to the lack of separate statistical data for trade in Tien Shan Lan Lu or the Tarim basin, the present section deals with Sinkiang, including Tien Shan Pei Lu, as a whole.

including Sinkiang, led by Chang Kien, was mainly backed by the object of enhancing trade. Since then many Chinese trade missions, in the name of so-called embassies, were sent into this region. Although they were sometimes interrupted sporadically on account of the occupation of this region by various nomadic tribes in later periods, Chinese trade-relationship with this region has on the whole been carried on with fairly good continuity during the past thousands of years. Later, in the last quarter of the nineteenth century, since the establishment of this region as a provincial unit of China, Sinkiang's trade with Inner China has become even much closer. Especially during the period of the World War, when Russian trade was greatly curtailed in this region, trade with Inner China has kept increasing with great rapidity to a maximum in 1925. The annual volume of trade, including both export and import, for those years, was estimated to be about 4 to 5 million Haikwan taels. In 1925, the total volume was reported to be as high as 6 million Haikwan taels. In recent years, owing to the sharp Russian competition, together with the political unrest in Inner China, Chinese trade with this region has gradually dropped. But, even so, according to the recent investigations of Sin-Shui Co., Chinese trade with this region, import alone, amounts to an average of about 2,700,000 Chinese dollars annually in years 1930-32. Besides, there are also big amounts of transient trade through Inner China, mostly through Tientsin, with foreign countries. Again, according to the investigations of the same company, the total amount of transient trade, even in the period of world depression, in the years

1930-32, exceeded as high as 5,300,000 Chinese dollars annually.

In order to have a clearer understanding of the general types of commodities and their relative values in connection with both the domestic trade between this region and Inner China, and with foreign countries, the detailed results of these surveys may be tabulated as follows:

Principal commodities and their respective values shipped from Inner China to Sinkiang: (1930-32 average)

A. Those that are transported by automobiles:

Commodity	Values (Chinese dollars)
Cigarettes	760,000
Woolen-textiles-goods	104,550
Satin and silk goods	223,600
Hemp and other silk manufactured goods	285,200
Cotton-textile-goods	93,000
Medicals	59,680
Leather manufactured-goods	6,800
Hats, shoes, and other related manufactured goods	99,000
Materials for decoration	14,000
Books and other printed matters	60,000
Miscellaneous	18,200
Grand Total	1,724,130 (Chinese dollars)

B. Those that are transported by Camel-caravans (1930-32 Average):

Commodities	Values (Chinese dollars)
Various kinds of tea	868,852
Chinese tobacco	6,720
Low graded cigarettes	42,000
Low graded medicals and herbs	56,650
Low graded materials for decoration	14,250
Low graded cotton goods	12,000
Dyes	1,200
Chinese pens and papers, etc.	7,700
Sea-foods	4,100
Hardwares	2,160
Porcelain	1,560
Miscellaneous	5,240
Grand Total	1,022,432 (Chinese dollars

Principal commodities and their respective values transported from Sinkiang via Suiyuan to Tientsin for export (as transient-trade) (1930-32 Average):

A. Those that are transported by automobiles:

Commodity	Values (Chinese dollars)
Sheep intestines	2,400,000
Yang-ren-pih ( )	750,000
Lamb-hides	250,000
Yuh-han-tah-pih ( )	405,000
Fox-hides	286,000
Antelope-horn	270,000
Deers ( )	80,000
Wolf-hides	48,000
Squirrel's hides	24,000
Wild Cat's hides	37,000
Tieh-pih ( )	13,500
Other kinds of hides	23,100
Grand total:	4,616,700 (Chinese dollars)

B. Those that are transported by camel-caravans:

Commodities	Values (Chinese dollars)
Wool	336,500
Camel hair	125,000
Horse Hair	84,000
Raisins	54,000
Cotton (American variety)	66,000
Sheep hides of various kinds (lower-grades)	80,800
Lamb hides of various kinds	72,800
Medicines and herbs	18,200
Miscellaneous	25,000
Grand total:	852,400 (Chinese dollars)

Generally speaking, the principal commodities exported from Sinkiang to Inner China are various kinds of dried fruits, such as water-melons, grapes, apricots, etc., placer-gold, jade, and so on. On the other hand the imports from Inner China are mainly tea, tobacco, cigarettes, silk, cotton-clothes, herbs, porcelain, matches, sugar, hardware, etc. In the last few years, since 1932, on account of the continuous internal unrest of China and Sinkiang, together with the rapid progress of Russian economic penetration into this region, China's trade has been greatly reduced.

B. Trade with Soviet Russia:

With her geographical proximity to this region, Russia has kept an anxious eye upon the trade of Sinkiang. As early as 1851, as a result of the repeated request of the Czar's government, Ili and Tarbahatai or Tacheng were opened to trade with Russia by the Manchu Emperor. Later in 1881, another treaty signed between China and Russia which not only extended her trading areas she had thus far secured, to the Tarim basin, or Tien Shan Nan Lu, including Kashgar, Yarkand, and other cities, but also secured a special privilege of exemption from paying taxes. Since then, the Russian Government has spared no effort to encourage trade with this region. It was said that the Czar's government actively did so by offering a bounty of sixteen gold roubles for every pony load of goods that crossed to Sinkiang.[15]

With the continuation of the Russian Central Asiatic Railway system as far as Osh, on the trade route to Kashgar, the Russians gained an additional hold on the trade in the

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15. Violet Conolly, Soviet Econ. Policy in the East, 1933, p. 116.

Tarim basin, especially in the centers such as Kashgar, Yarkand, and Khotan. As early as 1913, Russia's portion of Sinkiang trade was already dominant, but during the time of the Great War and luter in the period of her Revolution, Russia almost completely disappeared from the arena of Sinkiang's trade. However, soon after the establishment of the new communist regime, Russia's ambitions and economic penetration into Sinkiang revived to a greater intensity. With the completion of the Turk-sib Railway, which runs parallel to the north-western frontier of Sinkiang, in 1930, the Russians gained a permanent advantage over the Chinese in the trade of Sinkiang. Besides, in connection with this line, there are two bifurcations under projection, one extending from Almaata to Kuldja or Ili and the other from Sergiopol to Bachty-Chuguchuk or Tacheng. The second is reported to be almost completed. With the signing of the so-called "Sinkiang-Russian Secret-Pact", in 1931 by the ignorant Governor Ching Shu-jen, Sinkiang has almost become an economic dependency of Russia. Since then Russian economic dominance in Sinkiang has been so strong that the Chinese trade position in this region has been almost hopeless.

As already pointed out, prior to the Great War, Russia had already gained a dominant position in her trade with this region. In 1913, the total exports of Russia to Sinkiang was reported to be about 8,400,000 roubles and the total import from Sinkiang was around 9,400,000 roubles with an excess of 1,400,000 roubles in favor of Sinkiang. Since then Russia's trade with this region dropped greatly. Even in 1923, several years after the revolution, the total

export to Sinkiang was only 51% of that of 1913 and the total import was as meager as 5% of that of 1913. It was not until 1926 that trade has started to keep increasing. In 1932, the volume of export of Russian goods to Sinkiang was 24% greater than that of 1913, and the total import from that region was as great as 86% increase over that of 1913. As a result of this rapid expansion, Sinkiang was ranked third among all the eastern countries trading with Soviet Russia in 1932.[16] The general trend of expansion may be readily shown by the following tables:

Sinkiang trade with Soviet Russia (1913-1932):[17]
(units: Thousand roubles).

Year	Exports	Imports	Total	Excess of export ( ) or import (-)
1913	8,427	9,846	18,273	1,419
1923	418	3,015	3,433	2,397
1924	2,611	4,535	7,146	1,924
1925	6,091	10,331	16,423	4,239
1926	10,232	11,754	21,986	1,522
1927	10,647	13,538	24,202	2,881
1928	16,051	13,778	29,829	- 2,273
1929	15,216	16,731	31,947	1,515
1930	13,945	10,212	24,166	- 3,742
1932	15,698	12,305	28,003	- 3,393

In regard to the commodities of Sinkiang-Russia trade, the major exports from Sinkiang to Russia are chiefly raw materials, such as wool, silk, hides, furs, cotton, rugs and carpets, horse, livestocks, and so on. On the contrary, the imports consist mainly of manufactured goods, such as textiles,

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16. Conolly, Soviet Economic Policy in Sinkiang, 1933, p. 121.
17. Tien Shan Monthly, published in Turkish, vol. I, no. I, October, 1934, p. 39.

sugar, oil products, metals and manufactured goods, hardware, electrical goods, chemical and pharmaceutical products, cookery, glasses, perfumery, and so on. The detailed conditions of its trade may be tabulated as follows:

Chief Sinkiang Exports to Russia (1923-29):[18]

(units: Thousand roubles).

Year	Wool	Cotton	Silk	Domesticated animals	Hides of various kinds
1923	1,129	33	--	1,041	802
1924	1,915	137	--	1,913	528
1925	3,411	1,537	--	3,077	1,823
1926	5,626	2,455	--	2,054	1,331
1927	6,504	2,724	99	2,132	1,996
1928	9,342**	2,339	321	1,502	190
1929	10,057**	1,999	1,421	2,751	173

** Including goat hair

Chief Russian imports to Sinkiang (1924-32):[19]

(units: Thousand roubles).

Year	Textiles (cotton)	Sugar	Metal-manufactured goods	Crockery and glase	Oil products	Matches
1924	1,536	283	45	42	34	3
1925	4,064	633	508	158	141	33
1926	6,691	851	854	429	72	211
1927	7,041	612	1,065	290	199	193
1928	10,008	1,556	1,683	383	312	147
1929	9,285	1,653	1,472	449	369	47
1932	11,236	978	850**	319**	142	96**

**Violet Conolly: Soviet Policy in the East, 1933, p. 119.

In the above tables, some interesting facts deserve special attention. Among the exports from Sinkiang to Russia, wool is the most important. In 1930, the total

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18. Tien Shan Monthly, published in Turkish, vol. I, no. I, Oct. 1934, p. 45.
19. Ibid., p. 48.

amount of wool exported to Russia was about 6,500 tons, consisting of about one-third of the total amount of wool Russia imported from all the nations in the Orient. In the imports, textile products, mainly cotton clothes, have always been the most important item. In 1932, this single item alone consists of about 71% of the total volume of trade. Among these a particular kind known as Dalemba is especially popular among the natives, and has the best sale.

C. Trade with India:

In contrast with Inner China and Russia, Sinkiang's trade with India has been comparatively insignificant. In 1927, the total volume was reported to be about 1,100,000 roubles. The principal exports from Sinkiang to India are silk, fabrics, hesi-i-shih, or hashish, etc. The main imports from India are European cotton clothes, dyes, medicines, spices, Indian tea, etc. In recent years, the British tried to encourage Indian trade with Sinkiang. But, owing to the natural handicap, with a trade route which has to cross seven of the highest passes in the world, so far little progress has been accomplished.

D. The General Character and Methods of Trade:

The trade of this region is characterized by several interesting facts. In the first place, this situation with the complete Russian domination is rather phenomenal. There are several explanations for this: (a) her geographical proximity to this region; (b) better communication facilities, thus lowering the cost of transportation; (c) easier approach by the Russian Tartars to the natives. Most of the Russian merchants in Sinkiang are Tartars or natives

from Western Trkestan. They speak the same languages with very slight difference, and have the same faith as the natives. Therefore, they have a special advantage in trading with the natives. On the other hand, the natives also regard these Russian Tartar merchants as their kinsmen and are very willing to trade with them. (d) The careful study of the psychology and the thorough understanding of the needs of the natives by the Russian Tartars--for instance, the sale of Delemba clothes--has also been another principal cause for the Russian domination of its trade.

Secondly, being situated far from the sea, coupled with the natural handicap of communication and high cost of transportation, the trade of this region with the outside world, except Russia, has been greatly limited. Only commodities of great value can be advantageously transported. This point can be easily realized if we will make a review of the commodities of trade between this region with Inner China and India.

Although various mediums of currency such as Chinese dollars, Sinkiang paper-notes, Russian roubles, etc. have been used for trade in this region, barter has been practiced to a very large extent. Besides,many other peculiar practices in trade are found. Especially the general scheme of trade between this region and Russia is of special interest. Russian trade in Sinkiang is carried on a regional monopoly basis. Each Russian trading company has a special area for business in Sinkiang and no competition is allowed among themselves. Thus, they are able to quote flat rates in each territory both for buying and selling. Whenever a

Sinkiang merchant delivers his raw materials to the Russian merchants, the prices of the goods as well as the exchange rate, are all fixed by the latter. During the time of payment, only part of the value was paid in cash and the rest was to be made in barter with Russian goods. Usually it took several months for such bartered Russian goods to arrive, after the previous transactions had been made. Such barter transactions have always been made in a very compulsory, one-sided, and unjust way. For instance, the Russian merchant may give whatever he deems fit to the Sinkiang merchants, without the least regard to the actual needs or desire of the latter. Again, the values or ratios of such goods involved in barter were also all arbitrarily fixed by the Russians. This is mainly due to the fact that owing to its geographical isolation, coupled with lack of modern facilities of communication with Inner China, there is no other outlet for her surplus raw materials than Russia. No matter how one-sided conditions these trade-transactions may be, the Sinkiang merchants have to accept them. There is no alternative. The loss of local produce was great during the time of the Great War when the Russians stopped buying from this region and is still remembered by many of its farmers.

E. Economic Potentialities of the Tarim basin or Tien Shan Nan Lu

In the foregoing sections, I have already mentioned briefly the abundance of the pastoral, agricultural, and mineral resources of this region. Industrially, with such rich resources, if modern methods of production were applied and communication facilities improved, plants of

various sorts such as textile mills, wineries, canning industries, paper-manufacturing, tanning and leather-manufacturing, gold-mining industry, petroleum-industry, and many other productive enterprises can readily be established.

Commercially, even at its present stage of arts, really in the most primitive stage of production, its big potentialities for future trade can not be over-looked. According to the most conservative estimate of Mr. W. Karameicheff, a famous Russian authority on this region, trade capacity of this whole province, including Tien Shan Pei Lu, before the Great War, may be tabulated as follows:

Economic Possibilities of Sinkiang:[20]

a. The annual export capacity of Sinkiang:

1.	Horned cattle	75 to 100,000 heads
2.	Sheep	800,000 heads
3.	Sheep's wool	100,000 piculs
4.	Camel's wool	15,000 piculs
5.	Horse hair	8,000 piculs
6.	Sheep skins and goats skins	600,000 pieces
7.	Lamb's skins	500,000 pieces
8.	Mare's skins	300,000 pieces
9.	Horned cattle hides	60,000 pieces
10.	Horn-hides	40,000 pieces
11.	Tanning substances	Indefinite
12.	Fur of all kinds (values)	10,000,000 (Chinese dollars

b. The import possibilities of Sinkaing:

1.	Tea of different kinds	500,000 boxes
2.	Sugar	200,000 lbs.
3.	Tobacco	2,000,000 lbs.
4.	Textiles	200,000 poods*
5.	Dalemba	100,000 poods
6.	Tsuemba	10,000 poods
7.	Chesubacha	5,000 poods
8.	Silk	5,000 poods
9.	Woolen cloth	5,000 poods
10.	Cotten velvet	5,000 poods

* 1 pood equals thirty-six pounds.

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20. W. Karamesheff: Mongolis and Western China, Translated edition, by C.W. Wang, 1932, pp. 149 and 153.

b. The import possibilities of Sinkaing: (by W. Karamsicheff): (continued)

11. Satin	3,000 poods
12. Chintz	7,000 poods
13. Haberdashery	$500,000
14. Hardware and other manufactured goods	$250,000
15. Tanned leather (excluding local tanned leather)	15,000 poods
16. Other articles	$2,000,000 (Chinese dollars)

Meager as these figures first appear, with the improvement of methods of production, the volume of production and the volume of trade may certainly be great, and be of some concern with the future world market.

3. Trade-routes with the outside world.

The trade-routes of Sinkiang may be generally classified into three major groups:

A. With Inner China.
B. With Soviet Russia.
C. With India.

A. With Inner China:

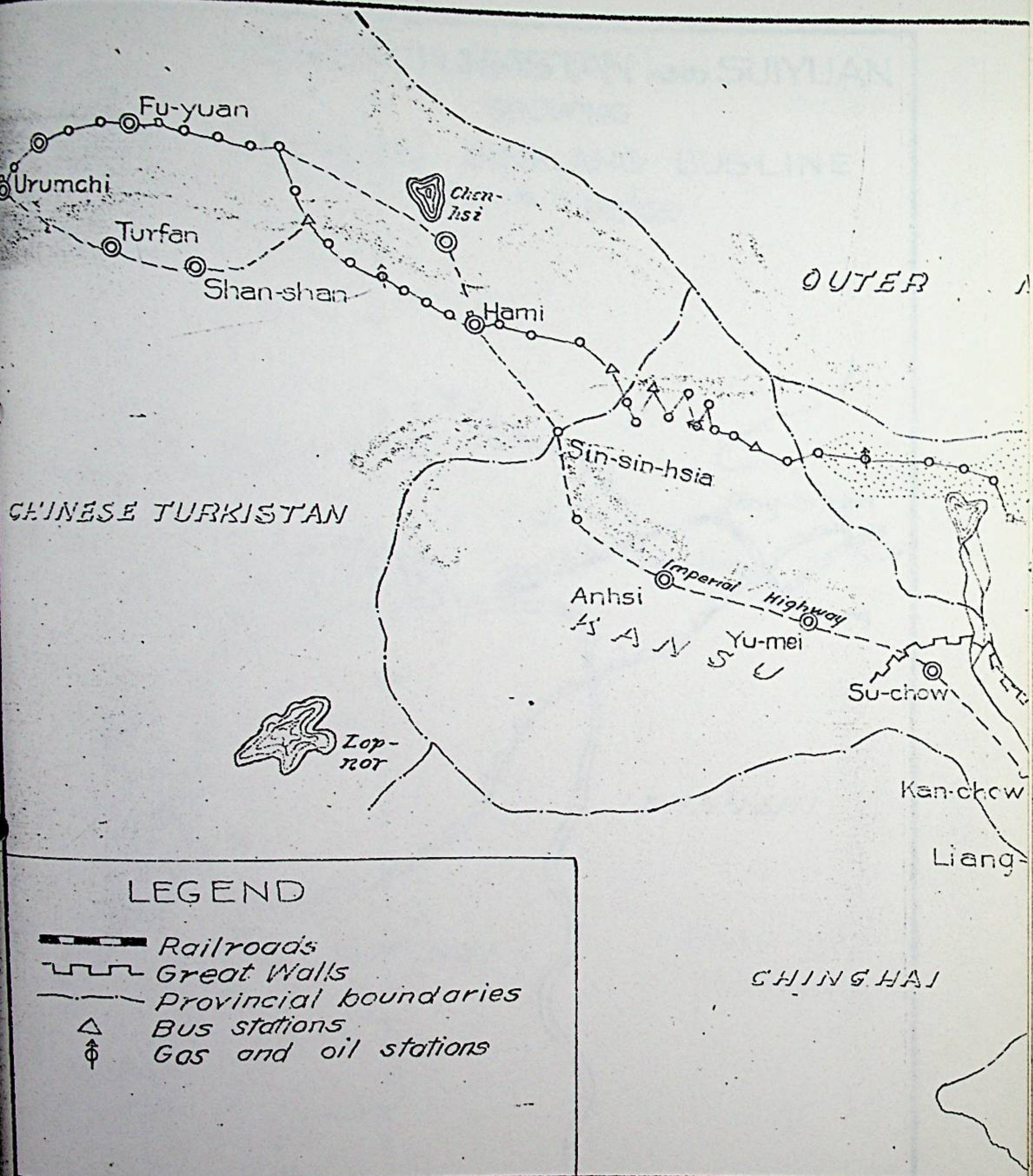
Not mentioning the old caravan road across outer Mongolia, formerly regularly used for trade, but later being abandoned on account of political causes in 1921, there are now two main trade-routes leading from Inner China to Sinkiang: (a) Northern Route, "Pei Tai Lu", or "Siao Tso Ti" (Small grass land) from Kwei-hwa or Kwei-shui, Suiyuan, across Inner Mongolia to Hami, Sinkiang. (b) Western Route, "Si Tah-lu", or Great Western Highway, also known as Imperial Highway, from Sian, Shensi, via Lanchow, Suchow, Kansu, to Hami, Sinkaing.

a. Northern-route:

This route, starting from the terminal station of the

Pei-ping-Sui-yuan Railway, Kweishui or Kwei-hwa, via Pei-lin-miao, Inner Mongolia, running across Gobi Desert, skirting the edge of Ninghsia and Kansu provinces to Hami, Sinkiang, has been used as a regular camel-caravan trade-route only in recent years, after the blockade of the outer Mongolian Caravan trade-route. The whole line is about 5,900 li long, almost one half longer than the former Outer Mongolian Route through Kalgan, Urga, to Ku-chen-tze. Ordinarily, it took four months for the camel-caravan to travel in one direction. However, on account of the "rest-period" of the camels from March to June every year--which means the suspension of the whole transportation--only one round trip yearly is possible. Thus trade has been seriously handicapped and was limited to a short time and confined to a very small scope. Recently, there has been a bus line established following the old camel-caravan route. Instead of taking four months, it now requires only 12 days for the whole journey, including halts. For the whole line, three main sections were erected: first section, from Kwei-shui to Er-Li-tze-ho; second section, from Er-li-tze-ho to Hami; third section, from Hami to Urumchi. Seventy-two stations were accordingly established. This line is running regularly now. It forms almost the sole means for the movement of goods from Sinkiang to Inner China and vice versa. In order to have a clear picture of the complete route, a map showing the present entire bus line is attached (Map 4) (IV).

It was said that this Northern Route, before its conversion into a regular caravan trade-route in recent years, was first traversed by a famous English geographer and explorer,

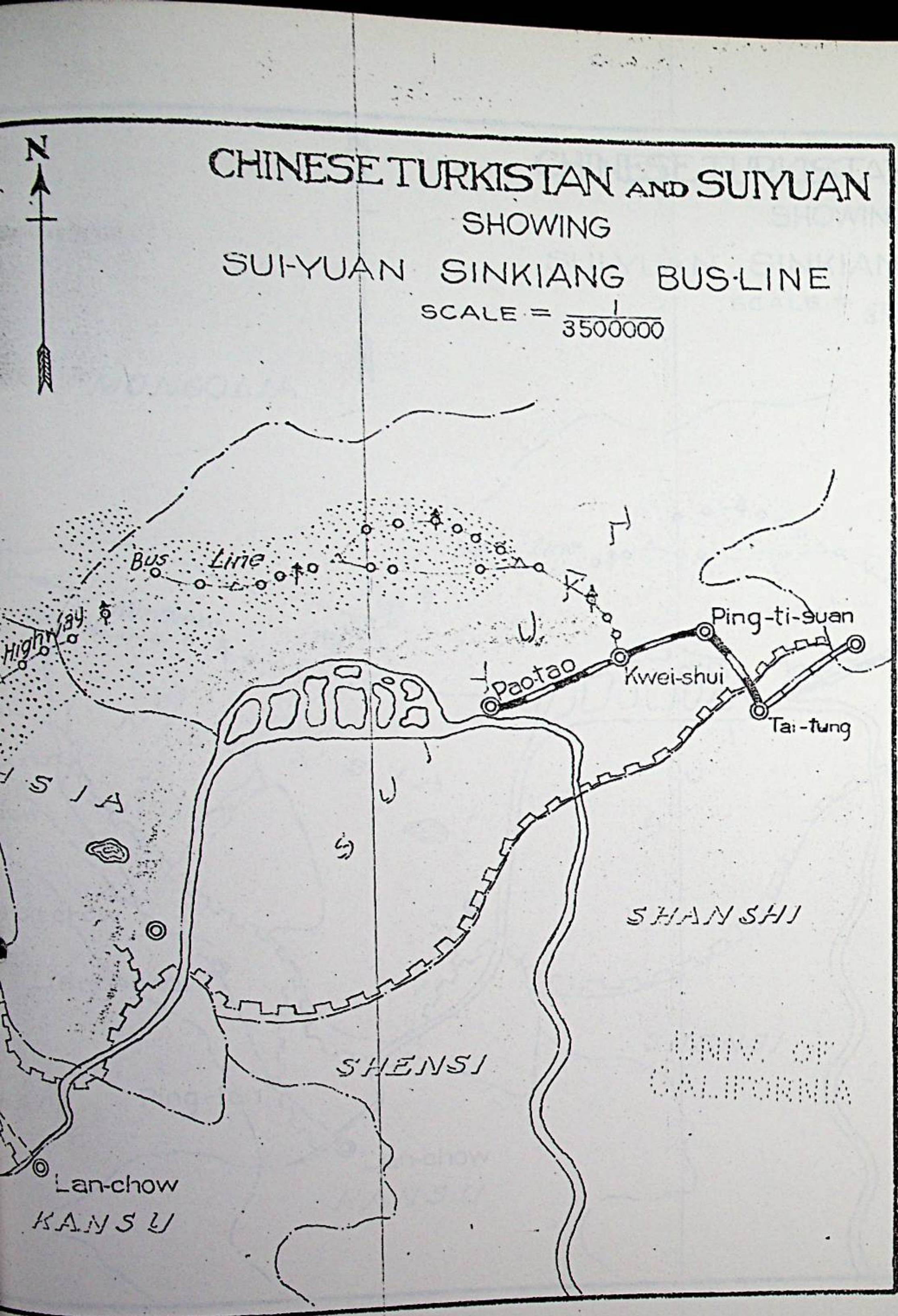

Fu-yuan
Urumchi
Turfan
Shan-shan
Hami
Chen-hsi
Sin-sin-hsia
Anhsi
Imperial Highway
Yu-mei
Su-chow
Kan-chow
Liang-
Lop-nor
OUTER
MANCHURIA
CHINESE TURKISTAN
CHINGHAI
LEGEND
Railroads
Great Walls
Provincial boundaries
Bus stations
Gas and oil stations

CHINESE TURKISTAN AND SUIYUAN

SHOWING

SUI-YUAN SINKIANG BUS-LINE

SCALE = $\frac{1}{3500000}$



CHINESE TURKISTAN AND S

SHOWING

SUI-YUAN SINKIANG BUS

SCALE = $\frac{1}{3500000}$

N

MONGOLIA

Bus Line

Northern Highway 184

Pao-tao

Kwei-shu

Liang-chow

Kan-chow

Ping-fan

Lan-chow

KANSU

SHENSI

SHA

Younghusband, in 1877.[21] Since then many people have followed it, including Owen Lattimore and Sven Hedin.[22] Both of them have given very excellent descriptions of conditions relating to this route.

b. Western Great Highway:

This is the cart-road running from the terminal point of Lung-Hai Railway, via Lanchow, Suchow, Liangchow, Kanchow, Anshi, to Hami, Sinkiang. The whole line is about 2,000 miles long. It is the oldest route linking Sinkiang with Inner China. It has been traversed for many centuries in historical times. Generally, it took three months to finish the whole journey. The road has been kept in a pretty good condition and continuous repairing has been done. With the exception of the sections between Anhsi and Hami where 200 miles of desert must be crossed, and in the section between Liangchow and Lanchow where there are rugged mountain ranges, the whole route can be turned very easily into a modern motor or bus line. For a long time the Central Government of China tried to put this into effect. Recently, a regular bus service between Sian and Lanchow has been operated. This section, which used to be traversed in one month, is now journeyed over in only five days. Extension of this bus line farther west is now a project of the National Economic Council. Besides, many suggestions have been made to use this line as a base for the further western extension of the Lung-hai Railway into Sinkiang, which now has its western terminal point at

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21. Journal of Central Asian Society, vol. 14, no. 2.
22. Owen Lattimore, Through Desert Road to High Tartary, 1927, and Sven Hedin, Across the Gobi Desert, 1933.

Sian, Shensi. This is also now under consideration. After the realization of this plan, it will form the west-east trunk line of the Chinese railway system and will bring the commodities from the coast straight to Innermost China. The best description of this route is found in the book entitled Ho-ko-chih-chen, written by General Lin Tseh-tsu, in the early part of the nineteenth century when he was exiled to Ili. Though short, it contains very valuable materials, describing general physical-geographical conditions of various points along this route.

One of the things to be noted in connection with this route is the recent establishment of an air-line, following the same line from Shanghai to Tihwa. The whole line, with a length of about 11,000 kilometers, can be travelled in only four days. In the summer of 1932, the writer himself, in his mission to Sinkiang, travelled by the said line. It is now regularly operated once a week.

In connection with this main Imperial Highway, there is another important caravan-route, known as the real "Nan-Lu" (Southern Road), in the early Chinese Record. This is the road starting from Suchow (Tun-hwang) which skirts the southern-most edge of the Lop and Taklamakan deserts for 1,250 miles via Cherchen, Keriya, Khotan, and Yarkand to Kashgar. Between the sections of Suchow and Charkhilik, there are more than 400 miles of trackless and almost waterless desert to be crossed. Especially the traversing of the salt-encrusted surface of the Lop region is considered the most difficult. In early historical times it was the

most important route both for military and trade purposes, for the Chinese penetration into this region. During the last few decades, both Stein and Hedin found many ruins of the Han dynasty around the Lou-lan sites along this route, showing the great significance of this route in early times. Again, it served for many centuries as the main track for the early central Asian traders and travellers. Both Hsuan-tsang and Marco Polo followed this route into Inner China in 640 A.D. and 1274 respectively. But, owing to the change of many factors, both physical and cultural, most of which are not fully understood, this route had been abandoned for centuries. Recently, with an attempt to recover this long abandoned track, the Ministry of Railways of the National Government of China sent several expeditions led by Sven Hedin, into this region. But so far no definite report has appeared.

B. Trade routes with Soviet Russia:

Sinkiang is adjacent to Russia on three sides, Chuguchak or Tacheng, Kuldja or Ili, and Kashgar. The main trade-routes, in conjunction with these localities, between these two countries, may be enumerated as follows:

a. From Urumchi via Manas, Chuguchuk, to Sergiopol, a station of the branch line of Turk-sib Railway:

This is now the most commonly used trade-route between Sinkaing and Russia. The writer had a chance to travel by this route in 1933. In the section from Urumchi to Chuguchuk carts are the chief means of transportation. But occasionally automobiles are also used. Generally it took 4 days by automobile from Urumchi via Manas to Chuguchuk. It is about 23 miles from Chuguchuk to Bachti, a point where the border line

between Sinkiang and Russian territory lies. From there, after travelling another 167 miles, Sergiopol is reached. Five hours by train from Sergiopol the passengers are brought to Semipalatinsk, which is the connecting center between Tashkent and Novorsibirsk. It joins the Western or Russian Turkestan and Siberia together. After another 30 hours' journey by train from Semipalatinsk, one reaches Novorsibirsk, a station of the Trans-Siberian line. This whole line as thus described is now the most convenient route for the transportation of commodities from Sinkiang to Russia proper, especially to Moscow. All the cotton from Turfan and wool from Karashar pass over this route to Turk-sib line and then to Trans-Siberian Railway.

b. From Kuldja via Sergiopol, to Siberia or via Alma Ata through Tashkent to Russian Turkestan:

This route forms one of the easiest approaches from Sinkiang to Russia, because of the short rail connection between Alma Ata and Kuldja. Since the completion of the Turksib Railway in 1930, transportation between Kuldja and the Russian border has been greatly facilitated. Hides, furs, and livestock of various kinds from Kuldja and its adjacent areas are moved to Russia over this route.

c. Roads from Kashgar to other centers:

There are several routes from the side of Kashgar to Russia. According to Mr. C. P. Skrine, three main ones may be mentioned:[23]

(1) From Bokhara by the Taldik pass and Irkeshtam:

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23. Journal of Central Asian Society, vol. 12, part 3, 1925, p. 234.

This is the ancient "silk road" from China to Persia. It has been used very extensively by the Central Asian traders in the early days. It is by far the most convenient and easiest route from Russian Turkestan to Kashgar, because of its low elevation. But during the time of Russian Revolution up to 1931, this route was blockaded by Chinese authorities and transportation along this line was strictly forbidden. Recently, since 1932, after the signing of the so-called "Sinkiang-Russia" secret Pact,[24] the port of Irkeshtam has been reopened to Russia for trade. From the standpoint of national defense, this should not be done. Hence, many suggestions have been made recently by the "Commission on the reconstruction of Sinkiang Affairs" to close this route again.

(2) From Andijan via Osh and the Terek Pass to Kashgar:

This route from Andijan via Osh to Terek Pass has been from time immemorial a commonly used route between Russia and Kashgar. From Andijan "a journey of 12 days by diligence to Osh and thence by pony caravan across the Terek pass (12,700 feet) Kashgar was reached". This route has usually been taken by those travellers from Europe who wish to reach Andijan by rail and steamer either via Moscow-Orenburg-Tashkend or via Constantinople-Batoum-Baku-Krasnovodsk-Samarkand. Sven Hedin and many other European travellers on their trips to this region have often followed the above route. The best descriptions of conditions along this route are

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24. Journal of Central Asian Society, vol. 18, part 3, 1925, p. 234.

found in the famous works, "Through Asia" and "Through Deserts and Oases of Central Asia" written by Sven Hedin and Miss Sykes respectively.

(3) From Railroad at Pishpek in Semirchis via Narin and the Turgot Pass:

From Tokmak, the terminal point of the sub-line of the Tashkend-Orenburg Railway, there is an easy track, fitted for wheeled transportation, leading to Kashgar via Fort Narin in about 17 marches.[25]

C. Trade-routes with India:

Being greatly handicapped by the physical barriers of the lofty ranges of Kara-koram-Kuenlun--Himalaya, travel between Sinkiang and India is most difficult and trying. Generally speaking, there are three main roads from India to Sinkiang,[26] namely: (A) Srinagar-Leh-Yarkand route; (B) Srinagar-Gilgit-Tashkurghan route; (C) Peshawar-Chitral-Tashkurghan Route. But among them only the first one can be said to be the regularly used route for trade.

a. Srinagar-Leh-Yarkand-route:

This is the most important, longest established, and most commonly, almost the sole route, used for trade purposes between India and Sinkiang. This route involves the crossing of seven of the highest passes in the world--Karakoram Pass--at a height of about 18,300 feet coming from the north. "For 14 consecutive marches all food supplies for man and beast have to be carried by caravans. Innumerable mountain torrents and not a few large rivers swollen with melting

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25. Journal of Central Asian Society, vol. 12, part 3, 1925, p. 236.
26. Ibid., vol. 12, part 3, 1925, p. 229.

snows have to be forded."[27] After a journey of 18 marches from Leh, Srinagar, the capital of Kashmir is reached. From there, after a journey of 200 miles by motor road, the passengers are brought to railroad at Rawal Pindi.[28] Ordinarily it takes about 25 days' march from Yarkand to Leh and an additional 20-30 days from Leh to the railroad at Rowel Pindi. The best and the most vivid descriptions of this route across Karakoram has been written by Col. Henry Trotter. From his writing I quote the following:

> "In addition to the crossing of six passes, the lowest of which is 17,000 feet above sea-level, and the highest 18,000, for a period of twenty-three days, I was never at a lower level than 15,000 feet, and during that period the thermometer seldom rose as high as freezing point (32 F), whereas at night the minimum would vary from zero to 20 below zero. For a period of 12 days, I was never at a level lower than 16,300 feet while from consecutive camping grounds were all over 17,000. The highest elevation at which our tents were pitched was at Dehra Kompas Camp, 17,890 feet above sea-level--that is, more than 2,000 feet higher than the summit of Mont Blanc.
>
> "For the whole of this distance (from Sanju to Tankse, about 350 miles), supplies of grain, both for men and horses, had to be provided in advance, and at a great many places neither grass nor firewood were available.
>
> "--------In many places ice-beds blocked up the whole road, one of which extended three miles down the Karakoram River."[29]

b. Srinagar-Gilgit-Tashkurghan Route:

This route is seldom used for trade purposes but mainly for carrying messages for the British Consulate at

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27. Journal of Central Asian Society, vol. 12, part 3, 1925, p. 229.
28. Etherton, In the Heart of Asia, 1925, p. 136.
29 Journal of Central Asian Society, vol. 4, part 4, 1917, p. 96.

Kashgar to India. However, it has been occasionally used by British officials going from India to Sinkiang. According to Mr. C. P. Skrine, who travelled by this route twice in June-July 1922, and September-October, 1924, respectively, this route is not suitable for regular trade purposes, though sometimes occasionally used for such. This is because

> "In the gorge of the Hunza River between Baltit and Miagar (about six marches) of this road, it is in many places quite impossible for loaded ponies, and all baggages have to be carried in 50-pound loads from village to village by a few local porters available."
> 30

Again, he describes this route by saying:

> "On the 12 marches between Baltit and the Mintaka Pass the traveller passes through as difficult a tract of country as can be found anywhere in the world. In the gorges by which the Hunza River cuts its way through the mighty Karakoram, the road, seldom more than two feet wide and often much less, is carried from ledge to ledge of the almost perpendicular cliffs on stakes let into the rock; glaciers, of which the greatest is the seventy miles long Batura, have to be crossed, and falling stones dodged on the numerous 'Stone-shoots' where no path can be kept up and the travellers must pick their way apprehensively across the unstable mountain face."
> 31

From Tsekurghan, there are two alternative routes, the eastern one and the northern one, followed by passengers in summer and winter times respectively, because in the summer the Gez River is unfordable below Gez Kasaul. Both are ten marches journey to Kashgar. This route is not suitable for freight purposes but for ordinary travellers with smaller baggage it is on the whole an easier route than the Leh one.

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30. Journal of Central Asian Society, vol. 12, p. 250.
31. Ibid., p. 252.

It is comparatively lower in elevation and supplies are much better distributed. Above all, it is also comparatively shorter than that of the Leh. Generally, it will take about 48 days to traverse the whole route, including halts. For a more detailed and vivid description of this route, the reader is referred to the most excellent book entitled "Chinese Central Asia" written by Mr. C. P. Skrine.

c. Peshawar-Chitral-Tashkurghan route:

This route, as Mr. Skrine describes, leaves rail head at Dargai, fifty miles north-west of Peshawar, and goes through Malakand and Dir over the Lahurai Pass into Chitral. Passing up the Chitral Valley, it crœses the Hindukush by the Baroghil Pass. "Four marches further from the Afghan-wakhan, the traveller is brought to the Wakhjir Pass where the territories of Russia, China, Afghanistan, and India meet. The Gilgit road is joined at Mintaka Aghzi on the east side of the Pass, and then follows the Tashkurghan route to Kashgar." This route has since recent years been constantly used by the Mohammedan pilgrims from Sinkiang to go to Mecca. They crossed the Pamirs in April and found their way through Chitral to Peshawar and Bombay and thence by ship to Jaddah. But one of the chief handicaps in this route is that in order to traverse the Afghan-Wakhan special permission has to be secured from the Kabul Government. Aside from this political difficulty, according to Mr. C. P. Skrine, this route is the easiest and cheapest of the three routes leading from India to Sinkiang as just mentioned above.

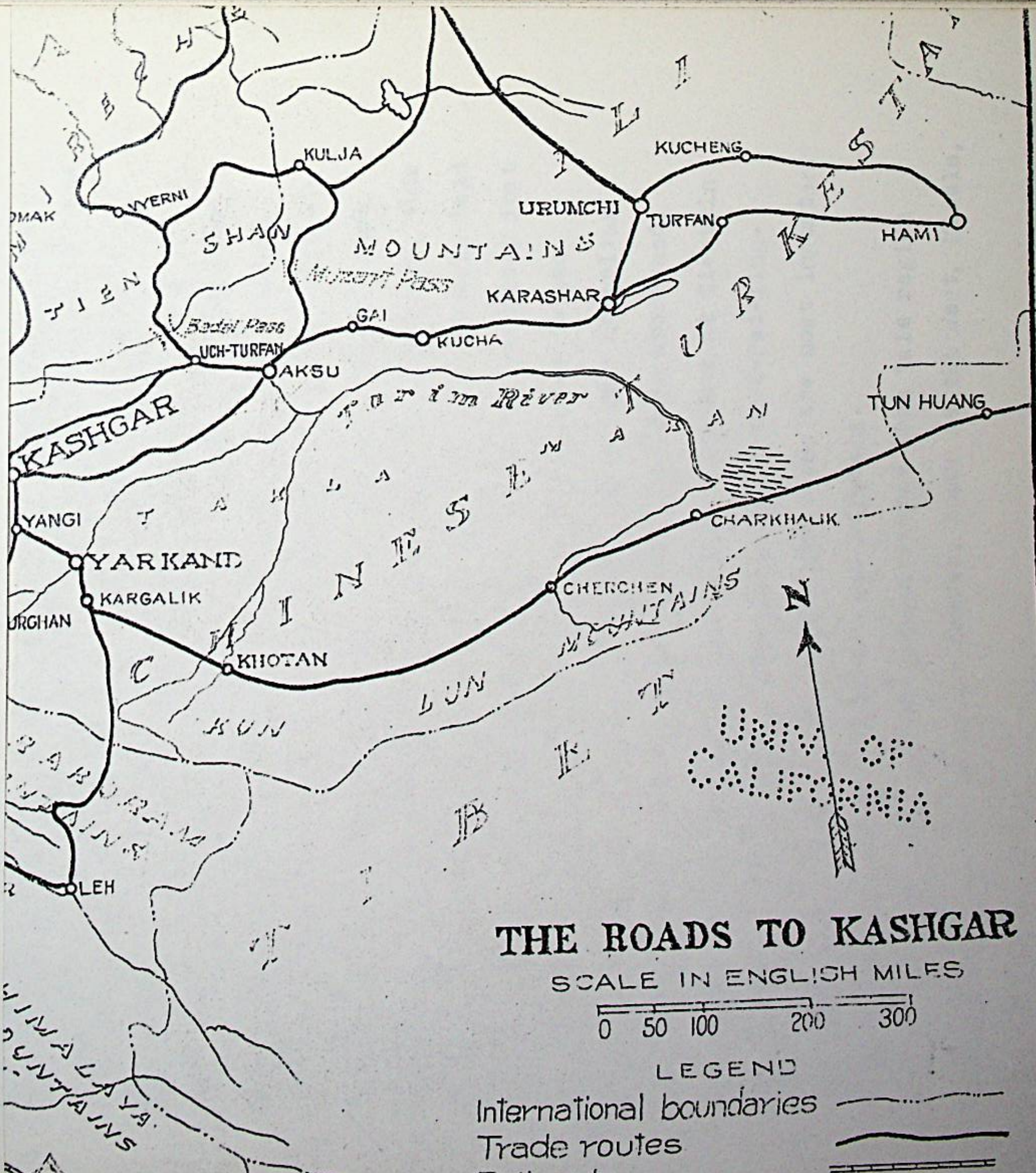
In bringing this section to a close, there is appended herewith, for reference, an excellent map prepared by Mr.

C. P. Skrine, showing the various routes leading from all the directions into southern Sinkiang, that is Kashgaria (Map V).

4. A brief resume of the relative historical importance of various routes and their present significance:

With the short discussion of various routes leading from this region, Sinkiang, into the outside world, including Inner China, India, and Russia, it might be interesting to have a brief resume of the relative historical importance of these routes and their present significance. First, the Western Imperial Way, running from Sian, Lanchow, Kanchow, Suchow, Tunhuang, into Hami, Sinkiang, from time immemorial, was at least definitely known at the time of Han dynasty, and up to the present, has been the principal route for Chinese penetration into this region. From the point of Tunhuang on the Western Imperial highway, various routes diverge: one leading from Tun-huang via Charkhilik, passing along the ~~southern~~ northern foothills of Kuenlun to Kashgar, the other, leading from Tunhuang to Hami via Turfan, Karashar, Kucha, Aksu, to Kashgar; and the third one leading from the same point, Tunhunag, to Hami, via Barkul, (Chenhsi) Kuchentze, to Urumchi. Among these diverse routes leading into the heart of Sinkiang, the first mentioned one, that is, the Tunhuang-Charkhilik route has been used in the earliest times. From the Han Annals, we learn that all the military expeditions of Wu-ti into this region were carried through this route. Fa Hsien in 400 A.D., in his trip to India, also travelled the same route. Hsuan-tsang, another famous monk of Tang dynasty, in 640, travelled the same route on his way back from India to China. Marco Polo passed over this route


SERGIOPOL
CHUGUCHAK
LAKE BALKASH
KULJA
TOMAK
VYERNI
URUMCHI
TURFAN
KUCHENG
HAMI
KARASHAR
KUCHA
GAI
UCH-TURFAN
AKSU
KASHGAR
YANGI
YARKAND
KARGALIK
TASHKURGHAN
KHOTAN
CHARKHALIK
CHERCHEN
TUN HUANG
MOUNTAINS
Muzart Pass
Bedel Pass
Karim River
N


KULJA
YERNI
SHAN
MOUNTAINS
Muzart Pass
Bedel Pass
UCH-TURFAN
AKSU
GAI
KUCHA
KARASHAR
URUMCHI
KUCHENG
TURFAN
HAMI
KASHGAR
YANGI
YARKAND
KARGALIK
KHOTAN
CHERCHEN
CHARKHALIK
TUN HUANG
LEH
THE ROADS TO KASHGAR
SCALE IN ENGLISH MILES
0 50 100 200 300
LEGEND
International boundaries
Trade routes
Railroads
N
UNIV OF CALIFORNIA

during his trip to China. Since then, we have no written records about its use. Evidently it has been abandoned for centuries. As to the exact time that this had happened and the causes of its abandonment, we do not know. However, according to some authorities, this was perhaps accounted for by the change of the climatic conditions of this region, particularly because of the growing aridity of this section around Lop-nor, and the burying of the routes by drifting sands, etc. After its abandonment, the second route as mentioned above, that is, the Turfan-Karashar route, has become the most common route used leading into the heart of the Tarim basin. Prior to the construction of Peiping (Peking) Sui-yuan Railway, this route, Western Imperial Highway, has been almost the sole link, both for political and economical purposes, between Inner China and Sinkiang. Since then, most of the trade has been shifted to that railway-line at Kwei-shui via Chang-chia-ko (Kalgan) through Outer Mongolia to Kuchentze, Sinkiang, from the Western Imperial Highway. Therefore, this Mongolian route later took the position of that formerly held by the Western Imperial Highway and the latter gradually lost its economic significance. Later in 1920, owing to the political troubles in Outer Mongolia, this Outer Mongolian route, commonly known as "Dai-tsao-ti" has been abandoned. It was not until 1927 that the Chinese merchants at Tientsin succeeded in establishing the present Kwei-shui-Pei-ling-miao-Hami-Urumchi bus line, which now forms the most important trade route between Inner China and Sinkiang.

In regard to the historical routes from this region to India, there are three in number, known as the West, Middle,

and the East routes. The West route crosses Muzart Pass of Tien Shan to Russian Turkestan (Khiva, Samarkand) and thence through Afghanistan to India; this route was traversed by Hsuan-tsang of Tang dynasty (640 A.D.) on his way to India. The Middle route is from Khotan, Yarkand, through Karghalik and crosses the Pamir to India; this route was taken by Hsuang-tsang in his way home from India to China. Dr. Aurel Stein also followed this route from India in his 1913-16 expedition to this region. The East route is from Khotan, turning south, across Karakoram, to Ladak, and thence to Kashmir, corresponding to the present Yarkand-Leh-Srinagar route; this route was traversed by the famous Chinese monk, Fa Heien, in Ching dynasty, 400 A.D., on his trip to India. Of the above three routes, the first mentioned--two, the West and the Middle routes, for reasons not clearly known, have been abandoned particularly for trade purposes, for long times--although they have been used sometimes for travelling or sporting purposes--the only commonly used trade route between Sinkiang and India now is the "East" route, that is, the Yarkand-Leh-Srinagar route.

As to the historical routes between Sinkiang and Russia, we do not have very much information. However, we do know that in the early days, the constantly used route was to cross the Muzart Pass of the Tienshan and by way of Kuldja to Russia. But since the completion of the Trans-Siberian Railway and the Turk-sib line, this Urumchi-Manas-Chuguchuck-Sergiopol-Novosiberek line has become the most

important and the most commonly used route, both for political and economic purposes, for the link-up of Sinkiang and Russia proper, mostly because of the lower expense of transportation by rail. This still holds true at present .

5. Trade centers of the region

As to the trade centers of Sinkiang, the following may be mentioned: Kashgar and Yarkand, one facing closely the center of the railway-web of Russian Turkestan, Andijan and Tashkent, and the other lying at the mouth of the Srinagar and Leh route, are the most important trading-centers with Russian Turkestan and India respectively. Hami, situated at the mouth of Tien Shan Nan Lu and Tien Shan Pei Lu, a connecting center of both the Wei-hwa-Hami-Tihua Bus line following the valley of Yellow River, and the Great Imperial Highway from Kansu is now a very important center for trade with Inner China. Further North from Hami we find Ku-chen-tze which with its command of Mongolian routes and an easy crossing to Hami and the Western Imperial Highway, was formerly the capital of the caravan trade. In spite of the fact that it has lost her dominating position, because of the abandonment of the Outer Mongolian caravan route, ~~the capital of Mongolian caravan trade~~ in the past few years, Kuchenize is now compensated by being the center of big transient trade for goods moving out from the Tien Shan Pei Lu, as well as from Karashar and Turfan, owing to its proximity to the latter, via Chuguchuk or Tacheng to Russia. Above all, on the north and north-western side of Sinkiang, two other big trading-centers, Chuguchuk and Kuldja, mainly connecting with Russia,

are found. Especially through the former, Chuguchuk, heavy streams of traffic are consigned to Trans-Siberian Railway for Russia.

Chapter VI

Conclusion: Retrospect and Prospect

1. The Problem of Regional Reconstruction of the Tarim basin or Tien Shan Lan Lu

The foregoing chapters have described very briefly the general conditions of both the natural landscape and cultural landscape of this region. With this background we may proceed with a short survey of the future prospects of the Tarim basin, especially regarding the problem of its regional reconstruction. Major emphasis will be placed on the principal problems now confronting this region and their possible solutions. Since the Tarim basin is now classified as a part of the province of Sinkiang, many of her problems of regional reconstruction may be at the same time said to be the problems of the latter. Or, in other words, they have common problems and such problems are in many respects closely over-lapping.

In the past few years, several important works have been published treating of the general regional reconstruction of this province, Sinkiang, as a whole, including both Tien Shan Nan Lu and Tien Shan Pei Lu. Especially in the last year, another work has been published by the Commission on the Reconstruction of Sinkiang Affairs of the National

Government of China, of which the writer is a member and also a participant in its drawing-up. Unfortunately, this has also been drawn solely from the standpoint of this province, Sinkiang, as a whole, and not from that of Tien Shan Nan Lu. So far a separate account strictly from the stand-point of Tien Shan Nan Lu alone is still lacking. It is quite true that inasmuch as Tien Shan Nan Lu is now a political sub-division of the Sinkiang Province, many of the problems of the latter are par excellence the problems of the former. But, as we know, this region, the Tarim basin forms physiographically an entirely separate region, itself, and it has its own particular phase of problems for regional reconstruction. Therefore, a separate account of it alone is necessary. The present chapter is prepared with this viewpoint.

2. The economic potentialities of the Tarim basin and its importance to the future development of China--as a field of colonization.

Before proceeding to discuss the problems and prospects of this region, it may be advisable to recapitulate the economic potentialities of this region and its importance to the future economic development of China. Of one thing we are perfectly sure, that is, that this region, the Tarim basin, is much richer than its sister land Tien Shan Pei Lu. Even with its present primitive methods of production, the volume of its produce, notably agricultural and pastoral, is enormous. Two-thirds of the total volume of the present trade of Sinkiang has been derived from this region, the Tarim basin, or Tien Shan Nan Lu, alone. Again, two-thirds of the total income of the Provincial Government of Sinkiang is extracted from this region, alone.

Despite the almost complete lack of precipitation and the presence of the gigantic desert, Taklamakan, this region is a pretty good field for agricultural expansion. With a regular flow of water derived from the mountain glaciers and with fertile loess soil, Agriculture is now practiced with more regularity and dependability than many other non-desert areas on the globe. Again, climatically, it is much warmer and more favorable than the Tien Shan Pei Lu. Cotton of Turfan, silk of Khotan, Yarkand, Kashgar, and various kinds of fruits are found in all the localities of this region.

As to future prospect of colonization in this region, various estimates have been made. The Commission on the Reconstruction of Sinkiang Affairs has made the estimate that there is a possibility for 30 to 50 millions of colonists in the whole province of Sinkiang.[1] On the other hand, a famous German geographer, Dr. A. Penck, calculated that the highest limit for colonization for the whole Tarim basin will not exceed 75,000 people. He estimated that at most 1,000 square miles can be added to the cultivated ground of the Tarim basin and at the density of 75 persons per square mile.[2] Undoubtedly both have taken extreme view-points. Another comparatively reasonable estimate was given by Mr. Y. T. Chang, a Chinese geographer. He calculated that the highest limit of people for colonization of Sinkiang, as a whole, will be about 20 million.[3] According to his estimate, the general

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1. Report of the Commission on Reconstruction of Sinkiang Affairs, 1935, p. 26.
2. Geographical Journal, vol. 76, no. 6, December 1930, p. 484.
3. Y. T. Chang, Developments and Prospects of Inner Mongolia, 1933, p. 197.

distribution of land in this province is as follows: 40% desert, 30% mountains and lakes, and 30% cultivable land. Then he went ahead to give his calculation as follows:

Methods	Approximate no of Population
a. Through the reclamation of arable land (28,000,000 mow) (1 mow - 1/6 of an acre)	15,000,000 persons
b. By improving the present agricultural conditions of land being already cultivated.	15,000,000 persons
c. By expansion of pasture	3,500,000 persons

Personally, I think Mr. Chang has also been too optimistic and that his figures are on the whole too high. His estimate of accommodating 3,500,000 people by expansion of pasture especially appears to be groundless and inexplicable. Personally, for this region, the Tarim basin, with which I am more familiar, I should venture to make the following estimation. We may take the total area of this region as 350,000 square miles,[4] and assume that 75% of it is composed of desert and mountains, and lakes with the total land cultivable as 25%. Or, in other words, we will have a cultivable area of about 70,000 to 80,000 square miles. Suppose large-scale irrigation works be applied and all these lands be actually put into cultivation by modern methods. Then again assuming that the future desnity of its population be 120 persons per square mile, (this density of population is taken because from the standpoint of agricultural practice and with moderately high standard of living), instead of bein

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4. Estimates of the total area of this region also differ greatly among different authorities.

about 20 persons per square mile as it is now, then the whole area will at least have a possibility of accommodating 8,400,000 to 9,600,000 peoples, instead of ~~8,000,000~~ 1,500,000 persons as at present. Or, in other words, another 6,000,000 to 8,000,000 persons can be added to this region with its present standard of living. As there is no reliable data available for reference, this just represents one's personal rough estimat~~ion~~e.

Moreover, with the rich resources of agricultural produce and pastoral products of this region, modern industries of various kinds can be established conveniently and economically. Textile mills, leather-manufacturing, canning-industries, soda-manufacturing, fertilizer-manufacturing, paper-manufacturing, wineries, and iron-steel manufacturing, oil-plants, etc. all have some possibility for development in this region to supply needs that must now be met by transportation from terrific distances. Isolation will be in itself an incentive for industrial growth.

Again, the presence of rich mineral resources, notably gold and petroleum, has made the position of this region important to the future economic development of China as a whole.

3. Strategical position of the region and its importance to the national defense of China'

Above all, not only as a safety-valve for the suplus population of Inner China, as well as a source of raw materials for her future industrial development, this region is, most important of all, of greatest strategical importance to Inner China. As has already been pointed out, owing to the unique geographical position it occupies, surrounded by lofty mountain

ranges, this region is the rampart of north-west Inner China. In summarizing the strategic importance of the whole province, Sinkiang, including Tien Shan Pei Lu, Tso Tsun-tang, one of the most prominent generals of Tsing dynasty said: "To lay a stronghold in Sinkiang is to protect Mongolia, and to protect Mongolia is to safeguard the Capital (Peking)." If Sinkiang is lost, the whole north-west of China, especially Kansu, Ninhsia, Chinghai, and Shensi provinces, will lie entirely open to foreign invasions. Hence, from the standpoint of national defense, this region is next to our Northeastern Three Provinces (the so-called Manchuria), a line of existence for Inner China. It is for this reason that China, for the past 2,000 years, regardless of the enormous sacrifice of money and lives, has tried time and again to regain control. The most recent example of this was the expedition led by Tso Tsung-tang in 1877. Several years and millions of dollars were expended for its reconquest.

However, since its reconquest in 1877, irrespective of the fact that the region has been kept at peace and the people enjoyed a so-called "prosperity", the Chinese rule in this region, if judged strictly from the modern principles of government, can not be said to be successful. Especially after the assassination of the late governor-general, Yang-Tseng-sin, in 1928, Chinese misrule reached its climax. Consequently, Mohammedan revolts broke out in 1930 and bloodshed and turmoil dominated the whole province. In the early part of 1933, an independent government, under the control of a Mohammedan priest, Sa-bitida Mulla, was initiated at Kashgar. Although this government, owing to its internal

disunion, fell and the Chinese Provincial government gradually regained its power since then, this region, as a whole, up to the present, is still in a stage of disorder and turmoil.

During this period of disorder, the Russians, on the other hand, never spared efforts in peaceful penetration. For the last few years, the Russian influence has grown so strong that she not only completely dominates all the economic activities of this region but exerts a strong political influence as well.

4. The most pressing problems confronting this region and their solution:

Aside from the problem of Russian domination, there are a number of other problems of great geographical and economic significance now confronting this region, namely,

A. Improvement of communication facilities and closer line-up of this region with Inner China.

B. Adjustment of racial discordance between the Chinese and Mohammedans as a prerequisite for the successful carrying out of the plans and programs of its regional reconstruction.

C. Reconstruction of its present economy with special reference to the problems of:

a. Development of trade with Inner China.

b. Exploration of natural resources and development of industries.

c. Effective utilization and extension of irrigation works and improvement of its agricultural practices.

D. Politico-Geographic readjustment of the present provincial units.

A. Improvement of communication facilities and closer link-up of this region with Inner China:

The communication conditions in this region, the Tarim basin, have been so backward that not only every city is isolated within the region as an independent and individual economic unit, but also the whole region is effectively secluded from contact with the outside world. To the latter statement the relation with Russia is a practical exception. Partly owing to proximity and partly due to the two big Russian railway linee, namely the Trans-Caspian and Turk-sib Railways, which flank the whole region of Sinkiang; the movement of commodities to and from Russia has become comparatively easy. On the other hand, communicatione with Inner China have been so poor and slow that a trip to this region always means a journey of months. For instance, as already pointed out, the two common routes leading into this region from Inner China are via Kwei-shui through the Valley of Yellow River by bus and by the Great Imperial Highway from Lanchow via Hami through Turfan, Karashar, to Kashgar. For the former route, it now takes about seven days from Kwei-shui to Hami. But, from Hami to Kashgar where no modern means of communication are available, it often takes 40-50 days. For the latter route, from Lanchow to Kashgar it usually took four or five months by cart. Hence, all these desperate problems as now presented in this region, such as the constant political turmoil and bloodshed, dominant position of Russians, Isolation from Inner China, unimproved conditions of industry and agriculture, and many other problems are all a direct result of poor communications.

Thus it is evident and clear that if we want to make any attempt to improve the economic conditions of this region and to make it really a part of China, the most vital, urgent, and fundamental thing to do at the present time is to improve the communication facilities, both between this region and inner China as well as among the different parts of this region itself. During the past few years considerable attention has been paid to this problem and various projects have been advanced. But, unfortunately, most of them are too idealistic, and a carrying out of them is entirely beyond the present financial capacity of the government. In many other cases, plans were drawn in such a ridiculous manner as to disregard entirely both the actual geographic and economic situations of the region.

It is entirely beyond the scope of the present work to append a complete plan for the reconstruction and improvement of communication facilities of this region. However, some of the most urgent and immediate works may be pointed out.

It is unnecessary to say that the most urgent thing to do now is, of course, on the one hand, to maintain and to improve the regular running of the Kwei-shui-Hami-Tihwa bus line and on the other hand, to turn the Lan-chow-Hami-Tihwa section of the Great Imperial Highway into an automobile route. These will form the two trunk lines for the transportation of goods from Inner China to this province, as a whole. But, strictly from the standpoint of the Tarim basin or Tien Shan Nan Lu, the most urgent thing which needs to be done right now is to investigate and to reestablish the

old central route from Anhsi-or Tun-huang via Lop-nor through Charkhlik, Cherchen, Khotan, Yarkand, and to Kashgar, and to turn it immediately into a regular bus line. This is one of the oldest routes tr versed by the Chinese and the Central-Asian traders for past thousands of years since the Han Dynasty, but has been abandoned for centuries. This is by and large a shorter route, though not necessarily the easiest, from Inner China to this region and forms a direct link between the two. A realization of this plan will undoubtedly bring it into a much closer and more direct relationship with Inner China.

The next project for improving communication conditions of this region is the conversion of the present cart-road leading from Kashgar passing Maralbash, Aksu, Kucha, Kurla, Karashar, Turfan, and Tsieh-ko-chin near Hami, into a regular bus line. This route passes through the most populous and prosperous center of Tien Shan Nan Lu. Its eastern terminal point will be at Tsih-kuo-ching near Hami, where it will be joined by the present Kwei-shui-Hami-Tihwa bus-line and the projected Lanchow-Tihwa bus highway. The whole line will be about 1,800 kilometers long. The whole journey from Hami to Kashgar will take at most four or five days instead of about 30-40 days as at present. This enormous saving of time will undoubtedly make the moving of the rich resources of this region into Inner China much easier and quicker and thus facilitate the further development of trade between the two. Likewise, this will help to bring both Tien Shan Nan Lu and Tien Shan Pei Lu much closer

together and will promote the prosperity of its domestic economy. As to the total amount of construction expenses for the whole line, it was estimated that if the methods of "Ping-Kung-Chuh-Lu" be adopted, that is the building of roads by the disbanded soldiers, and utilizing of the local materials, the total expenses will not exceed 3,600,000 Mex. dollars (Calculated on the basis of 2,000 Mex. dollars per kilometer).

Moreover, in order to meet cases of quicker delivery, the present air-line from Shanghai via Lanchow, Hami, to Tieh-hwa should be extended with a branch line from Hami via Turfan, Karashar, Kucha, to Kashgar. Telegraph stations should be established among the important oases immediately.

Even with the successful carrying out of the above programs, the communication problems of this region can not be said to be completely solved; in the long run, bus transportation will be too expensive for this region. Especially in the present state of affairs, while nearly all of our petroleum resources along this route are still lying unexploited, all the petroleum has to be imported. It was reported that the transportation costs of such oils from coastal China to Inner north-western provinces have been as high as six dollars (Mex.) per gallon, about 6 or 7 times as much as the original costs. Thus the full cost of the present Sian-Lanchow bus section is as high as five cents per kilometer, too much for the average populace, especially the farmers, to bear. Moreover, owing to the comparatively small capacity of transportation of the bus or automobiles,

they are not suitable for transportation of the bulky agricultural products and other raw materials from this region. In many cases the costs of production of such commodities became so high that they are unable to enter the far market. Recently, in order to cope with such difficulties as thus mentioned above, the National Economic Council has tried to improve the old-time carts of the natives so as to make them suitable for transportation of those bulky commodities which can not be economically carried by bus.

As to air-lines serving as a means of communication in this region, the situation is even more hopeless. Being too expensive for ordinary commercial transportation, they are after all, too weak a link to bind so vast a territory to Inner China. Therefore, it is evidently clear that the fundamental problem of this region lies in the railway construction. But now there comes the problem of finance. There is a serious doubt whether China, in her present stage of finance, will be able to finance the construction of such a long line of railway which will bring no immediate returns. But, all in all, inasmuch as China wants to hold this vast, but rich region, railway construction is of urgent necessity, no matter how difficult her financial situation may be. Without rail connections the territory is likely to be lost to China. With such connections it will at least serve as a land of colonization from Inner China and may produce goods such as cotton, hides, etc. which will repay the costs of transport out of the area.

Regarding the projects of railway construction, various plans are found, most without economic merit. So

long as the trunk lines project is still unsettled and the future economic development of this region remains unknown, it is practically impossible to draw any intelligent plan, unless it is purely conjecture, for the complete railway system off-hand. As to the trunk lines, two may be regarded as of vital importance at the present: For the northern route, the extension of Lung-hai Railway from Lan-chow station following the old Imperial Highway via Hami, Tihwa, to Tacheng or Ili, as the most important and most pressing; for the southern route or Tien Shan Nan Lu, the Lanchow-Kashgar line may be mentioned.

The line, Lanchow-Kashgar line, may follow one of two routes. One is to follow directly the old Imperial Highway or by utilization of the trunk line, Lan-chow to Sinkiang either by way of Tacheng or Ili, to Tun-huang and from there via Charkhilik along the foothills of Kuenlen to Keriya, Khotan, Yarkand, and Kashgar. The other is to go by the way of Chinghai province, that is from Lanchow to Siling via Tu-lan, to Tun-hwang, and then to Charkhilik, Khotan, and Kashgar. The former is a more direct line while the latter by way of Chinghai, is more expensive and a little longer, with a total length of about 3,300 kilometers.

Though the above line would be of great economic importance, it will have to overcome the difficulty of laying and maintaining road bed on the desert, especially the section both east and west of Charkhilik, where very strong sand storms are often reported. As to the general expenses for this line, it is estimated by the Commission on the Reconstruction of Sinkiang Affairs to be about

130,000,000 Mex. dollars (on the basis of 40,000 Mex. dollars per kilometer). A map showing the projected lines for improvement of communication conditions of this region is attached (see Map VI).

B. Adjustment of racial discordances between the Chinese and Mohammedans as a prerequisite for the successful carrying out of the plans and programs of regional reconstruction:

Although this particular region is predominantly inhabited by Turki-Mohammedans, the racial difficulties are by no means slight. No discussion of the problem of economic reconstruction of this region can be given without considering this point. Furthermore, no programs of colonization from China can be carried out successfully without careful consideration and satisfactory solution of these racial problems. On account of the traditional policy of apathy held by the Chinese officials toward the natives during past years, the connection between the natives and the Chinese, to be exact the Hanese, has been exceptionally weak. Being very slightly affected by either the Chinese cultural or political influences, they have remained very indifferent, though not necessarily hostile, toward the Chinese rule and regard the Chinese officials as their oppressors, and the other Chinese people as heathen. Ideas of independence or self-rule have been cherished rather increasingly among minds of many of the young people of this region. Especially in recent years, as a result of the flow of young students abroad, notably in Russia, Turkey, and England, even this weak cultural bond with Inner China has been gradually weakened. As one of the young native leaders has recently remarked: "Instead of Peking (Peiping) or

CHINESE TURKISTAN
AND
ADJACENT PARTS OF INNER CHINA
SHOWING
PROPOSED LINES OF COMMUNICATION

0 100 200 400
ENGLISH MILES

N

Legend
- National Boundaries
- Provincial boundaries
- National highways
- Provincial highways
- Branch roads
- Horse trails
- Railroads
- Proposed Railroads
- Proposed highways

MONGOLIA

Chanhsi
Tsieh-kuo-chung
Hami
Anhsi
NIEN HSIA
EXPLORED
Tun-huang
Proposed Railroad
Tahmenih
Tahtung
CHING HAI
Lan Chow
Suiyuan
SHANSI
Sian
HONAN
HUPEH
SZE CHWAN
Chantung
SI KIANG
Sikiang

Nanking, most of the promising native youngsters have in recent years turned to Moscow or Angora as their ideal goals for cultural enlightenment." Above all, the constant instigations caused by the Russians, as well as the British, among the natives, have also aggravated this situation and made the separated tendency of this region stronger. No policies of economic exploitation or migration in this region by the Chinese can ever be successful so long as the natives continue to hold their present attitude of "indifference" and "aloofness" which might result in hostility in the long run. This actually forms the fundamental prerequisite for its economic reconstruction. Only by encouragement of promising young people of this region to go to study in Inner China can the real significance of Chinese culture be developed and the cultural-link of the two be strengthened. The writer has urged this very strongly during the last few years. One school especially for the promising young Mohammedan Turks has been actually established at Nanking in 1932.

The geographical situation of the region is such that it may be attracted to Russia, to Iran, to India, or to Inner China. From which direction the most vigorous attraction will be developed depends principally on the political alertness of these countries. The only advantage that China possesses is a recognized political title.

C. Problems regarding the economic reconstruction of this region:

There are many problems regarding the general reconstruction of this region but three important ones of geographical interest may be mentioned:

a. Development of trade with Inner China

As already pointed out in the previous section, trade of this region is now dominated by 2 characteristics: One is the almost entire stoppage of its trade with Inner China; and the other, the near monopoly of trade by the Russians. The remedy from the Chinese standpoint is, of course, on the one hand, to encourage trade with Inner China, and on the other to check Russian advancement. Regarding the measures for coping with the Russian domination of trade, the first pre-requisite is the abolition of the so-called "Sinkiang-Soviet-Secret Pact", signed in 1931, which is not only the direct cause of the present situation but will form a continuing bar to the future development of trade of this region. For Chinese national interests government control of trade with Russia is utterly necessary. It is absolutely advisable that we should from now on deal with the Russians as a single structural unit, as the Russians did in trade, instead of leaving the whole thing to the individual merchants.

b. Utilization of Natural Resources and Development of Industries:

The most urgent thing to do is on the one hand, to maintain and to improve the native hand-craft industries, such as cotton-weaving in Kashgar, Yarkand, and many other places, wilk-weaving in Khotan, Yarkand, and paper-manufacturing in Khotan, etc., and on the other hand, the initiation of new industries, such as fruit-canning and wine-making in Turfan, metal-works in Kucha, gold and jade mining in Khotan. But all these depend upon two things: First, the political stability of the region and secondly, its

convenient communication facilities with Inner China. If these two conditions are met, problems of capital and expert service, market, and other related problems can be easily and readily solved.

c. Effective utilization and extension of irrigation works and improvement of its agricultural practices

It is generally estimated that the cultivated area of this region, the Tarim basin or Tien Shan Nan Lu, is only 1 to 2 per cent of the total area. According to the census report of the Provincial Government of Sinkiang the total area cultivated for the whole province in 1913, was only 11,434,567 mow (about 2,000,000 acres). The most recent estimate of the Statistical Bureau of National Government of China gave the total cultivated area of the whole province as around 13,000,000 mows. This is amazingly small. Although so far we have no accurate survey for the total cultivable area of this region, of one thing we are perfectly sure, that is, this undoubtedly represents a minor fraction of its total cultivable areas. The soils, being mainly loess, are fertile in nature, if provided with sufficient water-supply. Again, in spite of the presence of the gigantic Taklamakan desert and of the high rate of evaporation, this region, with the flow of many streams, notably the Tarim, cannot be said greatly to lack water-supply for agricultural purposes. The whole problem lies partly in the small amount of population and partly, rather mainly, in the lack of effective and intelligent utilization of irrigation works. Although thousands of irrigation channels have been found in this region, none of them have been established with

modern scientific considerations. Problems like the distance of source of the water, the variability of its volume, the velocity of flow, depth of the river-beds, and other related problems of irrigation have never been surveyed or studied on a modern scientific basis. Consequently, many of the irrigation works thus built have been left in a very bad condition and even unusable. Again, owing to the loose character of soil in this region many of the banks of the irrigation channels have often fallen in and become unusable a short period after their construction.

Besides, attention to scientific damming has been deplorably lacking and disputes between the inhabitants of the upper streams and those in the lower streams have been very frequent. For instance, in Ba-tsu district, at the confluence of the Kashgar and Yarkand River, in the spring and summer times, when water is needed for plantation, all the waters are kept up by loess tanks regions of the upper-stream. While in autumn and winter times, the people store the water no more and the water remaining in the upper-stream regions is allowed to flow to Ba-tsu and thus cause the people of this region to be in a very desperate position. Constant disputes have often arisen between people of the upper-stream and lower-streams of this region.

Above all, irrigation by wells and electric pumping have also been neglected. All these problems are waiting solution. Their successful solutions will not only help to put the lands thus cultivated on a much safer and effective basis, but will reclaim a great many thousands of acres of lands thus left waste. This will bring greater prosperity

to this region and will mean betterment of livelihood of its people.

D. Politico-geographic readjustment of the present provincial unit:

Politically, this region, the Tarim basin or Tien Shan Nan Lu, is a part of Sinkiang province. But geographically, this is unsound. With a size of about 550,000 square miles, which is three times larger than the biggest province of Inner China, Sze-chwan, Sinkiang has too large an area to be governed as a political unit. Moreover, physically, being divided by the lofty range of Tien Shan Sinkiang falls into two sharply distinct natural regions, Tien Shan Nan Lu and Tien Shan Pei Lu. Each has an entirely different natural landscape and different physical backgrounds. The general economic life of these two regions, Tien Shan Nan Lu and Tien Shan Pei Lu, is very different. The former, Tien Shan Pei Lu, being largely a pastoral belt, is more akin to the pastoral regions of Outer Mongolia, while the latter, Tien Shan Nan Lu, being mostly occupied by oases, more or less resembles the cultivated areas of Inner China. Consequently, inhabitants of the Tien Shan Pei Lu are nomadic peoples and have as their chief occupation, animal husbandry. On the other hand, the people of Tien Shan Nan Lu, being largely settled farmers, have practiced agriculture. Geography determines the history of this region. This has been true from the very early historical times up to the present. In the very early records, for instance, the Historical Annals of Han, it was recorded that Tien Shan Pei Lu was known as "Hsin-Kuo" or nomadic kingdoms, and Tien Shan Nan Lu as "chu-kuo" or settled kingdoms.

A map showing the occupational distribution of these two regions, Tien Shan Pei Lu and Tien Shan Nan Lu, in the early Han times is attached for reference (Map III).

Thus, due to the major difference of their fundamental economic structure, the other phases of life of these two regions, such as the forms of social institutions and social organization and modes of living, etc. have also been different. Hence, each of them has a different set of needs and different problems. To rule them with the same policy is not only politically unsound but also physically impossible. The Tarim basin, or Tien Shan Nan Lu, by using the range of Tien Shan as its natural border, whould be made a separate and independent provincial unit and these two regions should be governed with different policies according to local needs. Again strategically, from the standpoint of national defense, the present provincial-unit arrangement is far from satisfactory. For instance, in case Kashgar was attacked from the side of the Russian frontier in view of the present extraordinary long physical distance from the Capital, Urumchi or Ti-hwa and especially in the present stage of its means of communication, it would be almost entirely impossible for the latter to do anything effective for the former.

In this section I have briefly summarized the most urgent problems facing this region and made some suggestions regarding their solutions. No successful plans can be carried out unless three contentions are met, that is, political stability within the region itself as well as in Inner China, scientific survey of the whole region and the improvement of its communication conditions.

E. A final word: The future fate of the Tarim basin.

Finally, let us not forget that despite the presence of such a gigantic desert, as well as the loss of its historical position as the corridor for the earlier central-Asian and east-west trade on account of the rise of modern marine transportation, this region, the Tarim basin or Tien Shan Nan Lu, is still a land of growing importance. Due to the recent introduction of air transport, it will regain its position as the gate-way on shortest distance-route between east and west. With its big potential wealth and unique geographical position it is a land of great promise and enormous significance. It is a connecting-point where three of the greatest world empires, China, Russia, and England, meet. Not mentioning China, which is undoubtedly the land-owner of this region, both England and Russia have kept an anxious eye on this big virgin land. Great Britain, with rather less interest from the standpoint of trade with India, has a major emphasis in the lofty mountain ranges of this region as a rampart of her possession in India. On the contrary, for the past few decades, Russia has made and is still making positive attempts for both economical and political control of this province of Sinkiang, as a whole. The development of her economic penetration in the last few years has been so startling that Sinkiang can no longer be considered anything but an economic province of Russia. Mr. W. Bosslard, in one of his recent articles concerning Sinkiang province, has made the following amazing remark: "In my opinion, Sinkiang had 'une existence de grace', being that at the mercy of Soviet Russia whenever

she should feel inclined to push the frontier a few hundred miles eastwards."[4] He is by no means exaggerating the situation. Personally, after a short visit to this region myself in 1933, I was strongly impressed with the Russian influence felt everywhere. From the standpoint of Chinese control of this region, I am convinced that now she is facing the most critical and the most trying period which she has ever encountered in the long history of her control of this region.

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4. Journal of Central Asian Society, vol. 16, part 4, 1929, p. 439.

A P P E N D I X

Appendix I

Glossary

Akin, daira, or tarim, referring to running water.

Akini (阿奇毛 -----Khrashar or Yenchi.

Anhsi (安西州)-----Persia.

Antsai (奄蔡) -----Khiva.

Bulak, referring to spring.

Buran, referring to storm.

Chia-mo (且末) -----Cherchen or Charchan.

Chie-shih-chien-kuo (车师前国-----Turfan.

Chie-shih-heo-kuo (车师后国-----Urumchi or Tieh-hua.

Ching-tsueh (精绝 -----Niya site.

Chiu-ping (罽宾) -----Kashimir.

Chiu-tze (丘兹) -----Kucha.

Choll, referring to pool.

Chong-kum, referring to great sand.

Chong-takai, referring to big forest.

Chu-che-pao (朱俱波 -----Karghalik.

Darya or daira, referring to river.

Daran or davan, referring to pass.

(I). For identification of geographical names of early "nations" of the Han dynasty and their corresponding positions at the present time, see pp. 67.

Dung, referring to black-hills.

Hu-mei (葫蜜)------Wakhan.

I-cheo or I-Wu (伊吾或伊烏 -----Hami.

I-tang (悒怛) -----Hepthalites or White Huns.

Jilge, referring to valley.

Kao-chang (高昌) -----Turfan.

Kao-fuh (高附) -----Kabul valley.

Kara-kashi, referring to black jade.

Kan-chu (豪磨) -----Samarkand.

Kie-sha (奇沙) -----Kashgar.

Kokala, referring to river arm.

Kol, Köll, or Kul, referring to dry river.

Ku-shi (姑師 -----Turfan.

Kwei-tze (龜茲 -----Kucha.

Li-hsuen (黎軒) -----Syria.

Lo-tsiang (婼羌) -----Charkhilik.

Min-bashi, referring to the chief of thousand men.

On-bashi, referring to chief of ten men.

Ostang-bagh, referring to the irrigated parks and gardens of the orchard beside the canal.

Pei-ting (北庭 -----Urumchi or Tieh-hwa.

Pi-chang (鄯善) -----Shan-shan.

Pi-shan (岌山) -----Guma.

Shahri-kettek-kum, referring to town in the dead forest land. sand.

Sarik-buran, referring to yellow storm.

Sha-kui (莎車) -----Yarkend.

Shen-tuh or Tien-chu (身毒或天竺) -----India.

Su-leh (疏勒 ------Kashgar.

Tagh, referring to mountains.

Ta-hsia (大夏) ------Bactria.

Ta-shih (大食) ------Arabs.

Tah-yuan (大宛) ------Ferghana.

Tah-yeuh-chi (大月氏) ------Indo-scythians.

Ustang, referring to canals.

Wen-suh (溫宿) -------Osh-Turfan.

Wu-I (烏壘) -------Karashar or Yenchi.

Yalik, Yailak, or Yailagh, referring to grazing ground.

Yien-tseh, (鹽澤) -------Lop-nor.

Yu-mei or Yu-tien (好疇或于闐-----Keriya.

Yuz-bashi, referring to the chief of hundred men.

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