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GEOGRAPHICAL STUDY OF THE PROPOSED KANSU-SINKIANG RAILWAY

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[Numerals in parentheses refer to the appended "References"]

The construction of a railway line from China's great eastern seaports to T'a-ch'eng has been proposed. This line, starting in the east near Ch'ien-t'ang-chiang Bay and extending westward to the O-min Ho valley, will pass through seven provinces for a distance of about 5,000 km. The successful completion of this railway will not only open an important Chinese channel of communication between the southeast and northwest, but will act as a short cut between Europe and Asia as well. Even though the part of the proposed railway to go from Ch'ien-t'ang-chiang to Lan-chou is still in the planning stage, the Lung-hai Railway, which is being continuously extended westward, might be utilized instead for the time being. Construction work on the proposed line from Kansu to Sinkiang has not yet started. This area, over 2,600 km long, is sparsely populated, consists of barren terrain, and has an arid climate. Linking these frontier regions with China proper will be invaluable, both from a defensive and an economic viewpoint. After the western regions had been subjugated by Wei-ch'ing and Huo Ch'u-ping, in the time of the Han dynasty, the area west of the Huang Ho (Yellow River) became a national route (1). The route going west from China proper started at Chia-yu-kuan, and proceeded along the southern edge of the T'a-li-mu (Tarim) Basin. This was the historically famous Silk Road, and had been established in this region because of its advantageous position with regard to nearby nations in Southwest Asia, the climate which was milder than that of northern Sinkiang, and the prevalence of oases created by the many streams that flowed along the foot of the K'un-lun

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Shan and T'ien Shan (2). Although in ancient times northern Sinkiang was inhabited by various nomadic tribes, it was little known to the outside world. This region established its first close relationships with China proper as a result of Genghis Khan's return after he had subjugated Europe. Northern Sinkiang's position has become even more important since the recent awakening of the Slavic peoples (3). In the past, people travelling from Pei-p'ing to northern Sinkiang would go by way of Kuei-sui and Pai-ling-miao in Inner Mongolia, and then across the K'u-hei-le Shan (Hurku Ranges), Ku-erh-pan-ch'a-han Shan (Curbun Saikhun Ranges), and the A-tse-po-ko-to Shan (Aji Bogdo) in Outer Mongolia in order to arrive at either Ch'i-t'ai or Chen-hsi. Many people travelling to northern Sinkiang from the corridor west of the Huang Ho would start from Chia-yü-kuan, proceed to San-tao-k'ou [illegible] Yü-men Hsien, and cross the Ma-tsung-shan further north by way of the Ming-shui mountain pass.

Those going to either Chen-hsi or Ch'i-t'ai would proceed along the northern foot of the K'a-erh-lei-k'o-t'a-ko Shan (Kalik Tagh), while those going to Ha-mi would proceed along the southern foot of the range (4). The above-mentioned route, linking China proper and northern Sinkiang, was an important one during the Manchu Dynasty. Due north of An-hsi there is a short cut that passes through Hsing-hsing-hsia. When Tso Tsung-t'ang became the Governor of Sinkiang, he greatly developed the northern route by widening this road and constructing additional way stations (5). The old route through Tun-huang and Lo-pu-p'o gradually fell into disuse. The present highway route between China and the USSR goes through Hsing-hsing-hsia; and this is the route that will be followed in the construction of the Kansu-Sinkiang Railway.

I. DESCRIPTION OF THE KANSU-SINGKIANG RAILWAY

A. Advantages of the Proposed Railway

The Kansu-Sinkiang Railway will be in a favorable position with regard to both communications and construction work in Europe and Asia.

1. Communications

The Kansu-Sinkiang Railway, through Lan-chou to the south, will enjoy an outlet to China's great eastern seaports (via the Lung-hai Railway). Furthermore, by connecting with the Turk-Sib and Trans-Siberian Railways in the west, it will be able to enter Europe. Thus, the Kansu-Sinkiang Railway will be the quickest and shortest line between Europe and Asia. At present, there are two possible communication routes proceeding from Shang-hai or Nan-ching (Nanking) to Europe. The land route via the Chinese Eastern Railway (Ch'ang-ch'un Railway) and the Trans-Siberian Railway is one possibility; the sea route via the Indian Ocean and the Mediterranean Sea is the other possibility. However, it is clearly apparent that the distance /to Europe/ will be much shorter via the Kansu-Sinkiang Railway than it now is via either of these above-mentioned land and sea routes. (The distance by sea from Shang-hai to the Italian Peninsula is 3,300 nautical miles, or 15,360 km. However, this distance can be shortened to 9,000 km by utilizing the eastern seaports to T'a-ch'eng Railway and one section of the Turk-Sib Railway and the Trans-Siberian Railway.) Furthermore, the fact that ships are much slower than trains should also be taken into consideration.

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Therefore, the communications between Europe and Asia will be considerably improved by the completion of the Kansu-Sinkiang Railway.

2. Construction

The shifting sands of the great Mongolian deserts located north of the Kansu-Sinkiang Railway would render the establishment of a railroad there extremely difficult. The great Tibetan Plateau located south of the Kansu-Sinkiang Railway forms an impassable mountain barrier. Hence, the principal part of this proposed railway, with the exception of the sections in the Wu-ch'iao-ling, T'ien Shan, Chia-i-erh Shan (Jair Ranges), and two or three mountain passes, is to be constructed along the foot of mountains where the terrain is practically level. Examples [of level terrain] are found in journeying from Lan-chou to the river mouth at Chung-liang, Ku-lang to Chia-yü-kuan, Pai-tun-tzu to Ma-lien-ching-tzu, Sha-ch'uan-tzu to the Ma-ma-ssu Ho or O-min Ho valleys in northern Sinkiang, etc. Patches of quicksand that are scattered along the way may be avoided by making detours. After leaving northern Sinkiang, the great plains of Europe are finally reached by crossing the Semipalatinsk steppes and the passes of the Ural Mountains.

B. Conditions Along the Proposed Railway

The longer the railway line, the greater the advantages, as far as communications and economics are concerned (6). The geological, topographical, and climatic conditions that characterize the areas along a railway become more varied in accordance with the increase in the number of villages, towns, and cities that the railway passes. Consequently, the amount of goods transported by such a railway inevitably increases since localities whose products differ greatly desperately seek a means of communicating with one another. Furthermore, the over 2,000-km-long Kansu-Sinkiang Railway will go through many [economically] varied sectors. For example:

The Ku-lang to Su-lo-ho section will traverse a narrow corridor where stock farming and agriculture flourish. The Su-lo-ho to Ha-mi section will go along the Great Gobi Desert, where water, grass, and inhabitants are extremely scarce. The Ha-mi to Ti-hua section will be located along both the southern and northern slopes of the T'ien Shan where the population is dense because of the existence of many oases. One portion of the Ti-hua to T'a-ch'eng section will follow along the northern foot of the T'ien Shan, the other will thread its way through northwestern Sinkiang, and creep over the Chia-i-erh Shan.

The terrain characteristics of the four sections of the proposed railway are as follows:

1. Lan-chou to An-hsi Section

The entire area west of Lan-chou and extending to Su-lo-ho, a distance of about 1,000 km, which is within Kansu Province and west of the Huang Ho, was formerly called "Ho-hsi" [west of the river]. The section from Ku-lang to An-hsi, whose topographical features form a sort of corridor, was once known as the "Ho-hsi Corridor." This section was formerly an important economic, social, and cultural focal point for Central Asiatic, Southeastern Asiatic, and European peoples. The research carried out by Sven Hedin in the vicinity of Yu-men uncovered traces of the ancient Silk Road, which was about 10 feet wide. Horses

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and carts utilized this route for thousands of years. The traces of this highway are already buried 6 or 7 feet underground (7).

The highest point which it is necessary to pass along the Lan-chou to An-hsi section is located at Wu-hsiao-ling, where it is 3,013 meters above sea level (8). The Chuang-lang flows into the Huang Ho east of this range while the Ku-lang flows past the city of Ku-lang on the west of the pass. The second highest divide is located at Ting-chiang-miao, 2,600 meters above sea level (9). The third highest pass is located at Hui-hui-pao, west of Chia-yü-kuan, 1,805 meters above sea level. With the exception of these points it will be very advantageous to build the railroad in this area since the terrain along the other sections is level. The Chuang-lang mouth is located over 40 km from Lan-chou, northwest on the Huang Ho. Going north towards the source of the Chuang-lang, points passed are Ku-shui-pao, Yeh-hu-ch'eng, Ch'ing-sou-pao, Ta-t'ung-pao and finally Yung-teng. The Chuang-lang meanders through the 2- or 3-km-wide valley in which Yung-teng is situated. The Great Wall and the highway both proceed along the side of this valley. After leaving Yung-teng and proceeding northward /via this highway/ the terrain becomes even more constricted as Wu-sheng-i and Shan-k'ou-i are reached. After Chen-ch'iang-i has been passed, the ground becomes higher as Wu-hsiao-ling is approached. After crossing the divide, An-lung-i, Lung-kou-p'u, and Hsi-shu-p'u are passed before finally arriving at Ku-lang. The terrain along the entire distance from the mouth of the Chuang-lang to Ku-lang is extremely precipitous and dangerous. The soil in this area consists of loess, clay, etc., and, consequently, whenever it rains, the road becomes miry. In the Ku-lang gorge sector of the valley, the nature of the surface is varied. The road winds its way along the side of the valley where there are tremendous rocks, precipitous and overhanging cliffs, terraces, boulders, mounds and patches of gravel. In the winter, a great amount of snow accumulates which tends to impede transportation; hence it will be advisable to construct this section of the railroad along the edge of the valley. The engineering task in this section will be formidable because of the large number of bridges, culverts, ditches, etc., that will have to be built here.

Strictly from the standpoint of terrain, that section of the Eastern Seaports--T'a-ch'ang Railway which goes from Hsi-ching (Ch'eng-an) to Wu-wei should not proceed by way of Pao-chi, T'ien-shui, Lan-chou, Yung-teng, and Ku-lang to Wu-wei. Instead, starting from Hsi-ching, it should proceed northwestward following the Ching He, through Ch'ang-wu, Ching-ch'uan, Chen-yuan, Ku-yuan, along the Shan-shui Ho pass, Chung-wei, and across the Mongolian grasslands to Wu-wei. This latter route not only avoids steep and difficult mountainous areas such as the Liu-p'an Shan, Lung Shan, Wu-hsiao-ling, etc., but it can utilize the natural thoroughfare of the Shan-shui Ho valley. The region west of Chung-wei, save for a few small sandy sections, is all grassland plain with few elevations. The route from Hsi-ching via Chung Wei to Wu Wei is very well suited for railway construction because the distance is shorter and it avoids the mountains (10). However, since this route does not pass by Lan-chou, it is not suitable from the political and economic standpoint.

It has also been suggested that the passage of the difficult Wu-hsiao-ling could be avoided by proceeding from Lan-chou downstream along the Huang Ho to Ching-t'ai /near Su-ch'iao/ and thence to Wu-wei. However, the defect of this route lies in its comparative length. From the standpoint of Kansu, neither of these two suggested routes is as important as the existing route, which is the transportation link between the eastern and western ends of the province. From the standpoint of national politics and economics, the two suggested routes are also unsuitable.

Sun Yat-sen, in selecting routes for China's railway construction, always attached more importance to economic and political considerations than to the construction difficulties that might be encountered along the way.

The terrain from Wu-wei to Chiu-ch'uan is unobstructed, except for Ting-ch'iang-miao, the second highest land in the /Ho-hsi/ Corridor. There is a considerable amount of cultivated land, and numerous towns and villages along this route. Wu-wei, Chang-yeh, Yung-ch'ang, and Chiu-ch'uan are all well-known and well-populated agricultural, commercial, and administrative centers, and the people are well to do. Furthermore, Wu-wei is the collecting point for sheep's wool sent from Tsinghai and the Ho-hsi Corridor, and is also the trading center for foreign goods. Wu-wei, during the War of Resistance /against Japan/ engaged in commerce on a larger scale than did Lan-chou (11). A broad valley stretches from Wu-wei westward in which are located Feng-lo-pao, Tung-ch'ang, Shui-mo-kuan, and Shui-ch'uan-tzu. The valley is narrowest between Shui-chuan-tzu and Hsia-k'ou-i, where it becomes less than one km wide. The terrain widens once again as Hsin-ho and Shan-tan are passed; Chang-yeh is subsequently reached via Tung-lo and Erh-shih-li-p'u. The waters of the Hei-shui Ho are used for irrigation purposes in the vicinity of Chang-yeh. This area, with its network of rivers and canals, is known as the best irrigated section of Ho-hsi. According to a map drawn by Sir Aurel Stein, it was estimated that 670 sq km of land could be cultivated in this area, which through its rice production had won a name for itself as the center of agriculture in Ho-hsi (12). Chang-yeh, which has about 150 temples, one temple in every ten buildings, has the most temples of any town or city in Ho-hsi (13). The land from Chang-yeh, going west via Sha-ho-pao and Lin-i, to Kao-t'ai, is all under cultivation. However, the distance from Hei-ch'uan-i, Yen-ch'ih-i, and Shuang-ching-i to Lin-ch'uan-i consists mostly of barren soil, sand deserts, withered plants, etc. The only oasis beyond Lin-ch'uan-i is located at Chin-ch'uan, which is an important pass between Kansu and Sinkiang. Chiu-ch'uan is the key to western Kansu Province, the administrative center for Ho-hsi, and the exchange point for goods from Kansu, Ningsia, and Tsinghai Provinces.

Desert land predominates from Chiu-ch'uan to Su-lo-ho, becoming more desert-like the further one travels westward. The third highest land in the /Ho-hsi/ Corridor is located between Chia-yu-kuan and Hui-hui-pao. The Chia-yu-kuan valley is very narrow and it forms a strategic outpost in this area of boundless deserts. The importance of Chia-yu-kuan is shown in the following statement of Lin-ching: "The route eastward from the Pamir Plateau to China is completely level and indefensible. Therefore, if we wish to defend China, we must first send troops to garrison our western frontier. When this has been accomplished, we will be able to rest easily, since the Pamir Plateau will then serve as our outer defense, and Chia-yu-kuan as our inner defense" (14). The route west of Chia-yu-kuan proceeds along the edge of the desert area passing Hui-hui-pao, Ch'ih-chin-hsia, Yu-men, San-tao-kou,

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Pu-lung-chi, and Shuang-t'a-pao to An-hsi. There are numerous river beds, such as the Ch'ih-chin Ho in the vicinity of Ch'ih-chin-hsia and the Liu-t'iao Ho which flows northward between Yu-men and San-tao-kou, all of which join the Su-lo Ho. These rivers all originate in the Ch'i-lien-shan mountains. When there is a dearth of melting snow, these rivers dwindle or dry up entirely; however, when a sudden mountain thaw occurs, they consequently overflow and flood.

The soil here is very alkaline. Although the surface is frozen over hard in the winter, during the spring, summer, and autumn it becomes muddy, and it is then most inconvenient to travel through this area. These difficulties could be avoided by proceeding north from Yu-men to Shih-erh-tun, heading northwest via the northern bank of the Su-lo Ho (the bank opposite An-hsi), then westward to Lung-wang-miao along the route of the present Sino-Soviet Highway).

2. An-hsi to Ha-mi Gobi Section

This section starts at An-hsi at its south end and proceeds north to Ha-mi. Its entire length is less than 400 km.

Beyond the Su-lo Ho, it enters the barren Gobi, which presents a vast and unchanging appearance. Two persons who travelled through this area, M. Cable and E. French, both declared that they saw only scattered, withered vegetation and not even one tree in the more than 300 km that they covered from An-hsi to Ch'ang-liu-shui (15). This clearly shows that this section of the Kansu-Sinkiang Railway will be of very little economic value. Provisions along this route are scarce. The climate is vicious, as there are frequent winds and sandstorms which cause dust to fly about in all directions. The exceedingly hot weather becomes especially unbearable for both men and animals during the summer, when most people travel at night and rest during the day in order to escape the heat. It will not only be extremely difficult for the men working on railway construction here in the future to endure the climatic conditions, but securing an adequate water supply in this area will also become a serious problem.

The terrain traversed becomes progressively higher as the road proceeds northward after leaving Su-lo-ho. The highest point that it reaches is Hsing-hsing-hsia, after which the land gradually becomes lower once again. According to Stein's survey, the height of various areas above sea level is as follows: Su-lo-ho, 1,160 meters; Hung-liu-yuan, 1,560 meters; Ta-ch'uan, 1,568 meters; Ma-lien-ching-tzu, 1,640 meters; Hsing-hsing-hsia, 1,695 meters; Sha-ch'uan-tzu, 1,244 meters; K'u-shui-i, 1,004 meters (16).

There are large amounts of coarse sand, gravel, and rock fragments in this area, which are the result of the process of rock weathering. The terrain near the Su-lo Ho is level, but considerably high ridges and weathered rock fragments appear as the route continues from Pai-tun-tzu towards Hung-liu-yuan. There are distributions of loess between Ta-ch'uan and Ma-lien-ching-tzu. The area between Ma-lien-ching-tzu and Hsing-hsing-hsia is crossed by several dried-up river beds. Hsing-hsing-hsia belongs to Sinkiang Province and occupies an elevated strategically important position. Gravel is found everywhere along the route from Sha-ch'uan-tzu and K'u-shui to Yen-tun. There are dried-up river beds in the vicinity of Yen-tun that used to flow from east to west. The terrain levels off between Yen-tun and Ch'ang-liu-shui, but it begins to rise again further north of the latter point.

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After passing through a barren and deserted region, grasslands and oases finally reappear.

It will be very difficult to secure water and railway ties for the construction of this section. However, the roadbed is excellent, and the abundance of gravel and coarse sand along the way will provide excellent material for road construction.

3. T'ien Shan Section

This section starts at Ha-mi, at its south (east) end, and proceeds northwards to Ti-hua through a completely mountainous region. There are towns established along both the southern and northern slopes of the T'ien Shan which depend on its melting snows for irrigation purposes. Examples of such towns are:

a. Ti-hua, which has been called the heart of Central Asia
b. Ha-mi, the strategic military point
c. T'u-lu-fan and Kan-te, located in the agricultural region
d. Chen-hsi, located in the stock-farming region
e. Ch'i-t'ai, an important center for communication with the outside.

It is the mountain passes of the region that make it possible for transportation to link the northern and southern slopes of the T'ien Shan.

Each of these passes is a means of communication, and a key to military operations. There are in this region three possible routes for the passage of men, animals, and vehicles. They are:

a. Proceeding from Ha-mi to Chen-hsi via the Pa-erh-k'u Pass (Barkul Pass), also known as the T'ien-shan-miao Pass.
b. Proceeding from Ha-mi to Ch'i-t'ai via Ch'i-chiao-ching and the Pei-shan-miao-tzu Pass (17).
c. Proceeding from T'u-lu-fan to Ti-hua via the Ta-fan-ch'eng Pass (Dabachin Pass).

Since it is extremely important to investigate beforehand the mountain passes through which the Kansu-Sinkiang Railway may proceed, the three mountain passes mentioned above are compared below.

a. Pa-erh-k'u Pass Route

The Pa-erh-k'u Pass is commonly called Huan-t'sai-kou, and also known by the name T'ien-shan-miao Pass (18). There were originally three mountain passes connecting Ha-mi and the Chen-hsi basin, namely, the K'u-lu-pu (Kullub), the Chang-kang-pu-la-k'o (Changabulak) and the Pa-erh-k'u. However, the Pa-erh-k'u is the only one of these passes suited for the passage of men, animals and vehicles (19). According to Douglas Carruther, the Pa-erh-k'u Pass is about 140 meters wide, and 2,806 meters above sea level. According to Stein, the elevation of T'ien-shan-miao (TN: alternate name for the same pass) is 2,932 meters. Stein's map indicates that Chen-hsi is 1,470 meters above sea level, while Ha-mi is 752 meters above sea level. After leaving Ha-mi, this route proceeds by way of Hei-chang-fang, Nan-shan-k'ou, T'ien-shan-miao, Sung-shu-t'ang, K'uei-su, Ta-ch'uan, Chen-hsi, Hsia-lei-pa-ch'uan, Ko-t'o-ching-tzu, Wu-t'u-shui, Chi-chi-t'ai-tzu, and Se-pi-k'ou. It continues along the northern foot of the T'ien Shan, and heads west via Mu-lei-ho, Ch'i-t'ai, Fu-yuan, Fou-k'ang, and

Kan-to before arriving at Ti-hua. The terrain along the southern piedmont of the T'ien Shan from Ha-mi to Nan-shan-k'ow is barren, and slopes only slightly. The Hei-chang-fang is but a pile of ruins. Nan-shan-k'ow itself is located in the mouth of the valley. A sector known as Huan-ts'ai-kou, where the valley is irregular, is passed on the journey north to T'ien-shan-miao. The mountain slopes become steeper as T'ien-shan-miao is approached. The T'ien-shan-miao mountain peaks tower above the Pa-erh-k'u Pass. Sung-shu-t'ang lies at the edge of the Chen-hsi basin at the valley mouth on the northern slope. The section from Sung-shu-t'ang to Hsia-lei-pa-ch'uan is the lower part of the Chen-hsi basin, and livestock are numerous since green grass grows luxuriously. This section is famous for its horses. The terrain is steep and barren at Hsia-lei-pa-ch'uan, Lo-t'o-ching-tzu, Wu-t'u-shui and Ch-chi-t'ai-tzu. These places are all about 2,000 meters above sea level. The terrain broadens out from Se-pi-k'ow to T'i-hua; small oases appear along the way. Formerly the Pa-erh-k'u Pass was the one necessarily used when travelling between Ha-mi and Chen-hsi, Ch'i-t'ai, Ti-hua, Wu-li-ya-su-t'ai, and K'o-pu-to. However, when the road via the Pei-shan-miao-tzu Pass was opened up, providing the quickest route from Ha-mi to Ti-hua, the Pa-erh-k'u Pass completely lost its former importance, and became no more than a local means of communication between Chen-hsi and Ha-mi. As a consequence, Chen-hsi experienced a commercial decline.

The Kansu-Sinkiang Railway could shorten the distance it has to travel in this area by passing through the Pa-erh-k'u Pass; furthermore, the crossing of the grasslands area of the Chen-hsi Depression has more advantages than crossing the Gobi part of the Ha-mi Depression.

Another advantage is the proximity of Chen-hsi to Wu-li-ya-su-t'ai, the political and religious center of western Mongolia. Nevertheless, the Pa-erh-k'u pass is considerably higher than either the Pei-shan-miao-tzu pass (1,617 meters above sea level) or the Ta-fan-ch'ang Pass (1,064 meters above sea level). Furthermore, the terrain is wholly unsatisfactory for railroad construction. Places such as Hsia-lei-pa-ch'uan, Wu-t'u-shui, and Chi-chi-t'ai-tzu, which are located in the western part of the Chen-hsi basin, are all steep and dangerous, and working conditions are difficult. Furthermore, few people live in this barren and economically unproductive region.

b. Pei-shan-miao-tzu Pass Route

This route starts at Ha-mi, and proceeds in a northwesterly direction along the southern foot of the T'ien Shan by way of T'ou-pao, Erh-pao, San-pao, San-tao-ling, Liao-tun, I-wan-ch'uan, Ch'e-ku-lu-ch'uan, and Ch'i-chiao-ching and thus into the T'ien Shan mountains. The route continues on to northern Sinkiang from that point via Pei-shan-miao-tzu, Se-pi-k'ou, and Ta-shih-t'ou. While this route, which threads its way through the Pei-shan-miao-tzu valley mouth opening into the T'ien Shan, does not have as high an elevation as the Pa-erh-k'u Pass, it does have many considerably varying elevations.

The terrain from Ha-mi to Erh-pao is still level and easy to traverse, but north of San-pao it rises and falls greatly, reaching its highest point at San-tao-ling. It falls after passing San-tao-ling, only to rise once again west of Liao-tun. Dried-up river beds, gravel, and fine sand predominate in this vicinity. The terrain west of I-wan-ch'uan becomes precipitous once again, as the highest elevation between Ha-mi and Ch'i-chiao-ching is found at Ch'e-ku-lu-ch'uan, 1,362 meters above sea level. The terrain falls west of Ch'e-ku-lu-ch'uan to a point

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where it is only about 700 meters above sea level at Ch'i-chiao-ching, which is situated in a depression between the mountains. Upon proceeding north into the T'ien Shan valley area, it suddenly becomes continuously steeper, rising from an elevation of 800 meters to one of 1,616 meters at Pei-shan-miao-tzu. This is the highest point in the valley. Pei-shan-miao-tzu /is on a ridge which/ is like a threshhold lying across the valley dividing it into a southern and a northern section. This southern section is steep, while the northern section is /comparatively/ level. The route in the latter section, after leaving the mountain pass at Pei-shan-miao-tzu, has dropped to 1,300 meters by the time it reaches Ta-shih-t'ou. It then gradually veers westward past Mu-lei-ho and Ch'i-t'ai to Fu-yuan, whose elevation is only slightly more than 600 meters above sea level.

The two weak points of this proposed route, are, first, that it is covered with ice and snow from December to the following March and hence unfit for vehicular passage during these 3 months (20); second, the steep terrain, frequency of mountain torrents, and the existence in the section between Ha-mi and Ch'i-chiao-ching of high ridges across the valley which constitute serious obstacles to transportation. Still, this route is better than the one via Pa-arh-k'u Pass in that it presents the shortest distance between Ha-mi and Ti-hua. The climate throughout the /T'ien Shan/ valley is much milder than in such places as T'u-lu-fan where it is unbearably hot in summer. There are many oases in the section from Mu-lei-ho to Ti-hua, and it is rich in agriculture and livestock.

c. Ta-fan-ch'eng Pass Route

There are two possible routes which lead from Ha-mi to T'u-lu-fan. One route follows the southern foot of the T'ien Shan to Ch'i-chiao-ching, and passes through Tung-yen-ch'ih, Hui-ching-tzu, Hsi-yen-ch'ih, T'u-tun-tzu, Ch'i-k'o-t'eng-mu, and Shan-shan on its way to T'u-lu-fan. The other route starts at Ha-mi, goes to T'ou-pao, and then proceeds southwesterly in a straight line along the edge of the Ha-mi Depression, past Ch'i-k'o-teng-mu in the T'u-lu-fan Depression and along the foot of the T'ien Shan until it reaches Shan-shan, and thus on to T'u-lu-fan.

The first route, if it were to be utilized, would require a great deal of bridge construction due to the presence of many steep mountain ravines. Moreover, the terrain is very undulatory in nature. With the exception of Sen-tao-ling, situated in the section from Ha-mi to Ch'i-chiao-ching and Ch'e-ku-lu-ch'uan, the terrain further west, between Tung-yen-ch'ih and Hui-ching-tzu, is characterized by very steep grades. The high land between Hui-ching-tzu and Hsi-yen-ch'ih is 1,200 meters above sea level, and is the divide between Ch'i-chiao-ching and T'u-tun-tzu. The road is steep and narrow, but this route also has its good points. It is comparatively easy to secure water at the scattered dwellings along the way. Furthermore, in the future it may meet at Ch'i-chiao-ching the route which is planned to connect Su-fu and Chen-hsi.

The latter route was favored by Dr Sun Yat-sen. It is 70 or 80 meters shorter than the first route, and contains gravel and fine sand along the way. After leaving T'ou-pao, it passes through the K'o-la-to-pai (Kapa Dobe). Here, terrain elevation falls to about 500 meters. This area is still known as an important oasis in the Ha-mi Depression. The route proceeds southwesterly past Si-na-no-erh (Shona Ner), a region

of dried-up lake beds only 150 meters above sea level, which is lower than the adjacent Ha-mi Depression. Then the terrain rises to a height of 600 or 700 meters before falling once again as the route veers westward. This barren, gravelly terrain rises and falls by as much as 400 or 500 meters and marks the division between the Ha-mi and the T'u-lu-fan Depressions. The route, upon nearing Shan-shan, 200 meters above sea level, reaches the edge of the T'u-lu-fan Depression. The terrain further west levels out until it is 24 meters below sea level at T'u-lu-fan. Southeast of Shan-shan, there are located famous and extensive sand hills which are known as the Sha-shan (Kum Tagh). All lines of communication proceed west of these sand hills, nearer to the T'ien Shan foothills.

The proposed Kansu-Sinkiang Railway skirts the foot of the T'ien Shan between Ch'i-k'o-t'eng-mu and Shan-shan, in order to join the highway that has already been established there.

This second route would be the best from the standpoint of both distance and construction. However, its major drawback is the extreme difficulty of obtaining water during the severely hot summers. The distance direct from T'ou-pao to Shan-shan is only a little more than 200 km. The problems of heat and water scarcity could be lessened by operating the railway at night over this section.

The route from Shan-shan proceeds westward along a narrow strip between the southern foothills of the T'ien Shan and the Sha-shan to the city of T'u-lu-fan. The population becomes more dense and the water supply is ample.

In order to reach Ti-hua, the route must make its way through the T'ien Shan valley over the famous Ta-fan-ch'eng Pass. The over-all length of the section from T'u-lu-fan to Ti-hua is about 200 km (21). This mountain pass is longer and wider than the two others /previously described/. Furthermore, there are many villages in the valley, such as T'ou-tao-ho, Pai-yang-ho, Ta-fan-ch'eng, Ch'ai-o-pao, etc., which are all well-known. T'u-lu-fan, situated at the southern extremity of the valley is 24 meters below sea level. The altitude increases as the route proceeds northward, reaching the highest point at Ta-fan-ch'eng, which is 1,064 meters above sea level. The terrain consequently declines northward, and upon reaching Ti-hua has fallen to 560 meters. South of Ta-fan-ch'eng the slope of the terrain is comparatively steep; the desert reappears with a lack of water and grass and the presence of much sand and gravel. Although there are tortuous streams flowing southward, their beds only serve to increase the roughness of the terrain. North of Ta-fan-ch'eng, however, the terrain gradually becomes smoother. The route, after passing Ch'ai-o-pao, comes out upon clear, open terrain in which desert conditions are greatly reduced.

Vehicular passage through the /Ta-fan-ch'eng/ mountain pass route will be affected by the incidence of great winds throughout the year, and by the oppressive summer heat at T'u-lu-fan. However, this mountain pass is the lowest one of the three that have been discussed, and the most favorable one from an economic standpoint. Because of its central position in the province, it would afford rapid transit between Ti-hua and southern Sinkiang, and have peculiar significance as the connecting link between communications in northern and southern Sinkiang.

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Ever since ancient times its control has been the object of contending military forces; hence this pass is, of all the passes through the T'ien Shan, the one of greatest importance.

This pass will be found to be the most suitable one for traversing the T'ien Shan section of the future Kansu-Sinkiang Railway.

4. Ti-hua to T'a-ch'eng Section

The last section of the Kansu-Sinkiang Railway that is to proceed from Ti-hua to T'a-ch'eng will undoubtedly constitute the most important trunk-line connection between the provincial capital /Ti-hua/ and the cities in northern Sinkiang. The route from Ti-hua heads west along the northern foot of the T'ien Shan, passing such economically important oasis towns as Ch'ang-chi, Hu-t'u-pi, Sui-lai, Wu-su, etc. It then creeps over the Chia-i-erh Shan to Lao-feng-k'ou, famous as the throat of the main thoroughfare of north Sinkiang, and important as the gateway between Ti-hua and T'a-ch'eng.

Upon proceeding further, the route enters the O-min Ho valley and reaches T'a-ch'eng. This route is known today as the Ti-ta (Ti-hua--T'a-ch'eng) Highway.

However, in accord with the plans of businessmen, the road might branch off northwest from Sui-lai, proceed northwestward along the Ma-na-ssu Ho, pass Sha-wan-hsien, enter the Chia-i-erh Shan, pass Lao-feng-k'ou, and descend the O-min Ho valley. Few people traverse this difficult route because it is passable only in winter, due to the sand banks which are encountered.

There is still another possibility. The line from Ti-hua to T'a-ch'eng, instead of going through the Chia-i-erh-shan-k'ou (or Lao-feng-k'ou), might detour west of the Pai-yang-ho (also called the Wu-lu-mu-ho) (22) and pass through Lo-t'o-po-tzu, situated between the Chia-i-erh Shan and the Ou-erh-ha-hsien Shan. The following paragraphs discuss each of the three routes mentioned above.

a. Ma-na-ssu Ho to Lao-feng-k'ou

The source of the Ma-na-ssu Ho is in the T'ien Shan. It flows northward into a great dry plain area. This river forms a natural route from Ti-hua to either T'a-ch'eng or Ch'eng-hua.

The road to Ch'eng-hua proceeds northwest from Sui-lai along the Ma-na-ssu Ho, and continues by way of Su-chou-hu, Sha-men-tzu, Hsing-lung-k'ou, Hsiao-kuai, San-ch'a-k'ou, Ta-kuai, T'ang-ch'ao-ch'u, Huang-yang-ch'uan, Wu-lu-mu-ho, Ho-feng (Ho-shih-t'o-lo-kai), to Wu-lun-t'o, crosses the O-erh-chi-ssu Ho, and thus reaches Ch'eng-hua.

The road to T'a-ch'eng also follows along the Ma-na-ssu Ho by way of Hsing-lung-k'ou and Hsiao-kuai as far as Ta-kuai, and shortly beyond there, besides the road that passes through T'ang-ch'ao-ch'u, Liu-shu-ch'uan-tzu, Ch'eng-fa-tzu, and Lo-t'o-po-tzu, there is a small road that enters the Chia-i-erh Shan area, crosses the T'o-li Depression, passes Lao-feng-k'ou and the city of O-min, and thus reaches T'a-ch'eng. The section west of the Ma-na-ssu Ho as far as Lao-feng-k'ou consists of barren wilderness. Consequently, the information presented here is quite brief since very little has been written about this area. The terrain becomes higher as one proceeds westward, rising as it proceeds from a basin and plain area less than 500 meters above sea level to the Chia-i-erh Shan area, which is more than 1,500 meters above sea level. From then on, the terrain drops as the route proceeds westward past Lao-feng-k'ou and the O-min Ho valley to about 500 meters above sea level.

b. Wu-su to Lao-feng-k'ou

This route starts at Ti-hua, and continues via Sui-lai, Wu-su, T'ou-t'ai, Ch'e-p'ai-tzu, Hsiao-ts'ao-hu, Han-san-t'ai, Miao-erh-kou, Chia-i-erh-shan-kou, Ya-ma-t'u, T'o-li, and Lao-feng-k'ou in order to reach T'a-ch'eng, which is further west. The low part of the basin area is found in the section from Wu-su to the Chia-i-erh Shan foothills. For the most part it is rather level going. There are swamps in the vicinity of Hsiao-ts'ao-hu, concerning which Lin Ch'ao, who personally investigated this area, said: "It would be difficult to construct a road bed in this area because of the prevalence of salty swamps" (25). The section westward from Hsiao-ts'ao-hu to Chien-liu lies on the edge of the basin area; the mountainous section is encountered for the first time north of Chien-liu. From this point the route continues past Han-san-t'ai and on to Miao-erh-kou, an area which is more than 1,600 meters above sea level. The mountainous valley area makes its appearance between Miao-erh-kou and the Chia-i-erh Shan, which is also known as K'uei-t'un-ling or Shih-men-tzu. The Chia-i-erh Shan is the highest point reached along this section. According to a map published by the Shen Pao /a Shang-hai newspaper/, it forms the watershed between Wu-su and T'a-ch'eng, being about 1,810 meters above sea level. The terrain further north is broken and steep and becomes a narrow valley in which Ya-ma-t'u is situated. By the time T'o-li is reached, the terrain has widened so as to form a small basin. Lao-feng-k'ou lies to the north, and the whole area north of Lao-feng-k'ou is characterized by severe winter cold, and snowstorms accompanied by violent winds which endanger the lives of travellers. Therefore, walled enclosures have been constructed to afford travellers protection from blizzards. The climate in this area is the worst in the section between Wu-su and T'a-ch'eng (24).

c. Lo-t'o-po-tzu Pass

According to a detailed map of this area (25) and a railway map drawn up by Li Ch'eng-san (26), the following conclusions may be drawn. There is an extensive valley area, less than 1,000 meters above sea level, located northwest of the A-ya-no-erh-hu (lake), and southwest of the Pai-yang Ho (Wu-lu-mu Ho). This area forms an open route extending to the Wu-lu-mu Depression and the O-min Ho valley. There are many high points in this valley which are between 500 and 600 meters above sea level. Its northeast corner lies on the edge of the Wu-lu-mu Depression, while its southwest portion extends into a part of the O-min Ho valley. The terrain slopes somewhat towards the southwest. This valley, which contains a wide and level plain, is the site for such comparatively large villages as Chin-ch'ang, T'ieh-ch'eng-kou, and Ha-la-wu-su. Lo-t'o-po-tzu, located in its western portion, is the highest point in the valley (about 900 meters above sea level). From the standpoint of terrain, the Kansu-Sinkiang Railway should proceed along this route, which is far superior to that of the Chia-i-erh Shan mountain-pass route. Thus, it starts at Ta-kuai, proceeds north to T'ang-ch'ao-ch'u, and follows along the Ti-hua to T'a-ch'eng Highway through Liu-shu-ch'uan-tzu, Ch'ang-fa-tzu, Chin-ch'ang, T'ieh-ch'eng-kou and Ha-la-wu-su to T'a-ch'eng. The main road and the highway between T'a-ch'eng and A-shan at the present time both proceed via this valley.

All of the three above-mentioned routes have their good and bad points. The good points of the Ha-na-su Ho to Lao-feng-k'ou route are that it proceeds along the course of a river; consequently, it is easy to secure an adequate water supply; furthermore, this route is the shortest one, and part of it passes through a level plain area. Its weak points

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are the steep slope of the terrain through which it passes, and the many swamps north of Sha-wan and near Ta-kuai that would make difficult the construction of a solid roadbed.

The good point of the Wu-su to Lao-feng-k'ou route is that it proceeds through land occupied by the nomads.

The construction work needed along the Lo-t'o-po-tzu Pass route would be just like that needed along the Wu-su to Lao-feng-k'ou route. However, it would pass through an economically more valuable area than the Ma-na-ssu Ho to Lao-feng-k'ou route. The Lo-t'o-po-tzu Pass route is superior to the other two lines as regards terrain advantages, but inferior to them as regards climate, since fierce winter winds and snow prevail along its route.

Therefore, it would appear most suitable for the proposed western section of the Kansu-Sinkiang Railway to follow along the Ma-na-ssu Ho route. After having followed the original proposals set forth by Dr Sun Yat-sen as far as Ta-kuai, the line should proceed to T'a-ch'eng by going north to T'ang-ch'ao-ch'u and the Lo-t'o-po-tzu Pass. This line also forms a part of the trunk line connecting Ti-hua and A-shan (Ch'eng-hua).

There is, topographically speaking, still another excellent through route from Ti-hua to T'a-ch'eng. West of Wu-su between Ai-pi-hu and A-la-k'u-erh-hu, the Chun-ka-erh-men (Dzungaria Gate) is located. The terrain in this area consists of a long, narrow valley which looks like a long alley. This is the thoroughfare that has been travelled since ancient times by nomads entering or leaving northern Sinkiang and the southern Russian grasslands. This might make an excellent through railway route. However, swamps occupy a vast area covering both extremities of the valley and the land adjacent to the lakes. Thus, it would be entirely impracticable to construct a roadbed in those sections. There are no large villages along this route, since the fierce winds that suddenly arise are injurious to both men and domesticated animals. Furthermore, after going past the national boundary line, this route has to pass through Soviet territory before it can re-enter Chinese territory and reach T'a-ch'eng. Although this route proceeds through favorable terrain, it is inferior to the other routes /described above/ with respect to national defense and economic factors.

II. AREAS DEPENDENT ON THE KANSU-SINKIANG RAILWAY

Communications in the northwest are still undeveloped. If the proposed Kansu-Sinkiang Railway can be completed, cities and towns along the railway will benefit by this development, while other new cities will spring up as a result. Goods will flow freely; Sinkiang, Inner Mongolia, Tsinghai, Kansu, etc., will all be greatly affected. The main Kansu-Sinkiang Railway will be able to extend its influence to various cities through its branches (or feeders). The term "areas dependent on the Kansu-Sinkiang Railway" refers to those areas that will be affected by the communications network provided by these branch railroads or feeders.

Next, the area southwest of the proposed railway route will be examined. This area includes such places situated along the upper reaches

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of the Huang Ho as Hsun-Hua, Kuei-te, Ta-ho-pa and Yu-shu, the latter being an important trading point near the Sikang-Tsinghai boundary; Hsi-ning, located in the Tsinghai Basin; /the area/ from Huang-yuan to Tu-lan; Ta-t'ung and Wei-yuan, located on the Ta-t'ung-ho; Min-lo, within the Ho-hsi Corridor; the northern foot of the K'un-lun Shan from Erh-ch'iang, Yu-tien, and Ho-tien to Su-fu; the southern foot of the T'ien Shan from Yen-ch'i and K'u-ch'e as far as Pa-ch'u; Ching-ho and Po-lo, along the northern foot of the T'ien Shan; I-ning and Sui-ting in the I-li valley, etc.

The area northeast of the proposed railway route includes places along the Huang Ho such as Ching-t'ai, Chung-wei and Ning-hsia; Ting-yuan-ying and Ch'u-yen-hai in Inner Mongolia; Ming-shui in the Ma-tsung Shan; Wu-li-ya-ssu-t'ai and K'o-pu-to in Outer Mongolia; Kan-te, Ch'i-t'ai, and Chen-hsi along the northern foot of the T'ien Shan; Ch'eng-hua in the A-erh-t'ai Shan, etc.

These cities will in the future be completely transformed into trading or commercial centers upon completion of the Kansu-Sinkiang Railway. Ti-hua's position will become one of even greater importance, while T'a-ch'eng may come to be known as an international city. Other cities, such as Ha-mi, T'u-lu-fan, Chiu-ch'uan, Chang-i, Wu-wei, Hsi-ning, Lan-chou, etc., may likewise experience a prosperous future development.

The Kansu-Sinkiang Railway will establish connections /wherever possible/ with present communication lines, auxiliary lines to be constructed later, and all other types of communication. The areas adjacent to the railroad will obviously benefit as a result. The vast distances that have to be travelled in the northwest will be further shortened when the Kansu-Sinkiang Railway, which slants across this region, is used in connection with other local means of communication. These include the present caravan routes which only pass through desert areas, and the post transportation system via the old main roads which cover all areas. Furthermore, there are other auxiliary or tributary routes such as the Kansu-Tsinghai Highway (Lan-chou to Yu-shu and Tu-lan in Tsinghai); Kansu-Sinkiang Highway (Lan-chou to Ti-hua); Kansu-Shensi Highway (Lan-chou to Hsi-an); Kansu-Szechwan Highway (Lan-chou to Ch'uan-pei); Kansu to Ningsia Highway (Lan-chou to Ning-hsia); the Hsi-ning, Ta-t'ung, Wei-yuan, and Chang-i line; the Tun-huang to An-hsi line; the Ha-mi to Chen-hsi line; the T'u-lu-fan to Su-fu line; the Ti-hua to I-li line; the Ti-hua to Chen-hsi line; the T'a-ch'eng to Ch'eng-hua line, etc.

All of the above-mentioned communication routes can be considered as branches of the Kansu-Sinkiang Railway. These will convert the above railway into a systematic communications network. The increased transport activities that thus can be carried on will result in the expansion of hitherto undeveloped markets. The present lines of communication are completely inadequate to cope with the needs. The greater the number of branches possessed by a railroad, the larger its profits. Construction of still other railways and highways, such as the following, will be needed: T'ieh-shui to Lan-chou; T'a-ch'eng to Sergiopol; the Lan-chou to Hsi-ning line; a proposed line from La-sa to Lan-chou which will be used to transport the local products of Tsinghai, Sikang, and Tibet, such as sheep's wool, drugs, etc.; Wu-wei, Chung-wei, Ku-yuan, Chen-yuan, and Ching-ch'uan to Hsi-an, etc.

Three highways that should be constructed in conjunction with the Ho-hsi Corridor section are:

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1. A line from Wu-wei to Min-ch'in and Ting-yuan-ying which, by going through the northern grasslands, would serve to link the Kansu-Sinkiang Railway with the Pei-p'ing to Kuei-sui Railway.

2. A line from Chiu-chuan to Chu-yen-hai which would facilitate communication with Pao-t'ou on the east, Ha-mi on the west, Ho-hsi on the south and Outer Mongolia on the north. Its importance may easily be imagined. This line will in the future connect highways in Sinkiang and Suiyuan.

3. A line from Tsinghai to Tu-lun and Tun-huang which would proceed by way of the Ch'ai-ta-mu basin and Pa-k'a-ch'ai-ta-mu to Tun-huang, which is located at the western extremity of the Ho-hsi Corridor, on the edge of the South Sinkiang Basin. Thus, the Ch'ing-hai, Ch'ai-ta-mu, and South Sinkiang basins will all be connected.

The An-hsi to Ha-mi section, across the Gobi, does not require any auxiliary railroad branches, because the land is barren, sparsely populated, and of minor economic value. A branch line of the railway should be constructed from Ha-mi via Ming-shui and Chu-yen-hai to Pao-t'ou. Ming-shui (TN: not located on available maps) is an important mountain pass of the Ma-tsung Shan. According to Stein, it is about 2,000 meters above sea level and is provided with abundant springs. Ming-shui is important as the starting point of the main road proceeding northward to Outer Mongolia, and as a barrier to penetration southward of the Ho-hsi Corridor. From the standpoint of national defense, Ming-shui is as valuable as Chu-yen-hai. The completion of this branch line will mean the linking of these two important military points. The section from Chu-yen-hai to Pao-t'ou is very well travelled, due to the abundance of water along the way. The section from Chu-yen-hai to Ming-shui, on the other hand, is rarely travelled since it proceeds along a desert area of insignificant economic value. However, this section presents the quickest means of communication between Pao-t'ou and Ha-mi, and serves as an artery for the future development of Inner Mongolia and the colonization of the northwest. It also plays an important role in China's national defense. Two highways should be constructed, one going from Chen-hsi to Chu-yen-hai, and the other from Tun-huang to Erh-ch'iang.

The mountainous T'ien Shan section should have many branch lines appended to it, because of its strategic position in the communications system. Important additions to the railway system would be a T'u-lu-fan to Ha-mi line, since the oasis towns in southern Sinkiang are all said to be prosperous in agriculture, livestock, industry, and commerce, and they should be connected. Wu-shih, A-k'o-ssu, Wen-su, etc., are also important. Still another railway line should be built from Pa-mi to Ti-hua by way of the Pei-shan-mien-tzu.

As for highways, there are three that should be constructed: from Chen-hsi to Wu-li-ya-su-tai, from Chi-t'ai to Ko-pu-to, and from Ch'i-tai to Pao-t'ou. It will not be easy to construct branch railroads in the Ti-hua to T'a-ch'eng section near the frontier. But if the Kansu-Sinkiang Railway can be completed, there are three lines whose construction surely must not be omitted, viz., from Ti-hua to Chi-t'ai, Wu-su to I-li, and T'ang-ch'ao-ch'u to Ch'eng-hua.

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III. CONCLUSION

The Kansu-Sinkiang Railway will start in an agricultural area and reach a stock-raising area; it will extend from a densely populated area to sparsely settled areas. Through the colonization and development of the northwest, it will occupy an important place in the national policies. Furthermore it will be the most important transcontinental railway of Europe and Asia -- even more important than the Trans-Siberian Railway. Its future development may be awaited hopefully.

The construction of the Kansu-Sinkiang Railway has for its objective the meeting of economic, political, and national-defense needs. Its effect on a local economy might be somewhat as follows: Sinkiang, which is now China's great grazing area, may experience a future development into a meat-producing and wool-spinning central area. This area was referred to by Dr Sun Yat-sen as the "Argentina of China" (27). The lands along the northern foot of the T'ien Shan, the I-li Ho valley, the southern foot of the A-erh-t'ai Shan and the O-min Ho valley could expand agriculturally by utilizing the melting snows [for irrigation]. There are a great many oil- and gold-producing areas. These, together with the agricultural, animal husbandry, and mining areas, could use the Kansu-Sinkiang Railway to transport their products into [China proper]. Agricultural and industrial products, miscellaneous goods, tea, sugar, etc., that are produced in the southeast areas could be shipped to the northwest via this railway. The products of both regions, the southeast and the northwest, could be exchanged and distributed, and industry and commerce would flourish. This is the great need of our domestic economy. This railway will also be of considerable international value since China can use it to ship her surplus tea and silk to Europe in exchange for manufactured products; this is very important. Its construction will also contribute to vital defensive requirements, by furnishing the transportation for moving the excess population in the southeast areas to the northwest where these emigrants will fill up the underpopulated frontier areas, and afford a means of cultural exchange with their countrymen already living there. This far-distant land of Sinkiang since time immemorial has been the site of unceasing international conflicts due to its being surrounded by strong and greedy neighbors. The Kansu-Sinkiang Railway by firmly linking central China with the northwest will result in the political unification and strengthening of the Chinese nation. By extending for several thousand li through the heartland of central Asia, it will bring about unity between the interior and frontier areas, and thus the railway's defensive value will be a hundred times greater than its economic value.

Among the difficulties hampering the construction of the railway will be mountains, mountain passes, deserts, winds, sand, rain and snow, drought, and severe heat. Besides these, forests are few, lumber will be hard to get, and there are great distances with few people. There will be a dearth of laborers. A railroad itself is most profitable when it passes through densely populated areas. But when it passes from a densely populated region into a sparsely populated region, it also has its advantages. This was the principle of railway economics proposed by Sun Yat-sen (28). The construction of this railway conforms to this principle. It also agrees with his four principles for the construction of roads:

1. Proper selection of route (direct route between Europe and Asia)

2. As few obstacles as possible (favorable terrain)

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3. Meet the needs of the people (develop the economy of the Northwest, the exchange of animal husbandry products of the Northwest with the agricultural and industrial products of the interior and the manufactured articles of Europe)

4. Most advantageous location of the line (to solve international disputes and strengthen national defense)

From this may be seen the farsightedness and perspicacity of Dr Sun Yat-sen in planning this railway.

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