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SZECHWAN DURING THE WAR

H. L. RICHARDSON

Evening Meeting of the Society, 16 April 1945

CHINA IS a land of contrasts. In Szechwan during the war, the most striking contrast was that between ancient and modern: between the China described by Marco Polo, still medieval in the twentieth century, and the new China that is anxious to take a place among the leading nations of the world. The war situation intensified this contrast: at the beginning of the present war (which, it should not be forgotten, began in China as early as 1937) Szechwan was the most backward of the important provinces of China; all through the war the Central Government has had to struggle to bring Szechwan more up to date, even while the major struggle with the Japanese has been going on. This explains some of the curious paradoxes that will be referred to later.

It also explains another fact of life in wartime China, which may be expressed by saying that while there I alternated between two moods: wonder at what was being done, in spite of all the difficulties; and dismay because so many things were being done so badly. Similarly in the reporting of China abroad there have been various periods of uncritical admiration for China's prolonged resistance to Japan, alternating with periods of severe criticism because the resistance is not more effective or appears to be hampered by internal problems.

It is well known how slender China's resources have been, in everything except man-power and the will to resist. Once the Japanese had penetrated and partly occupied eastern and central China, no large-scale industries or manufactures remained to produce the munitions of war; and all the densely populated and fertile provinces were gone, with one exception—the Red Basin of Szechwan. Of the western provinces, Szechwan is the only one with a population of over twenty million, or an average population density of over two hundred per square mile. It was the only unoccupied province in China with sufficient resources to enable even a delaying war to be waged against Japan. Further it was magnificently protected against invading armies by

mountains; and mountains have proved an even greater obstacle than oceans to the advance of mechanized armies in this world war. The Red Basin has been in fact the heart of China during the war years.

Thus Szechwan well merits study from the point of view of understanding China's position in the war. At the same time, the Red Basin is a fascinating geographical unit in itself, perhaps the most remarkable of its kind in the world. This paper presents briefly the human and physical geography of Szechwan, and thus gives a picture of the background against which the drama of China's war effort has been played: the life of the people, the difficulties that have been met with, the attempts to modernize a backward area and to make it yet more fertile and productive. Like any realistic picture, we must include both light and shade. A disservice has been done to China by reporting only the favourable things. The world has been led to expect too much, and has been disappointed when much did not materialize, through not understanding what conditions in China were really like.

Szechwan lies somewhat to the south of the centre of Greater China, but towards the west of China proper. Beyond it to the west lies Sikang, or Chinese Tibet, and then Tibet itself. It may be noted that Chungking is close to the great circle course between London and Sydney, and about half-way between these cities. This is a fact that may assume greater importance in the future, with the growth of air travel. An air-route between London, Moscow, Chungking, and Sydney would follow the great circle course almost exactly.[1]

Population figures for Szechwan, as for other parts of China, are only estimates: usually based on the number of households multiplied by an assumed factor for the average size of a household. I have heard estimates ranging from forty million to seventy million for the population of Szechwan. The official figure some years ago was forty-seven million, of which rather under one million were non-Chinese speaking or aboriginal tribes-people who live in the mountainous border regions of the south and west.

The area of the province is of the order of 160,000 square miles, pre-war estimates being rather greater than the present area of Szechwan because of the transfer of a part of the south-western corner to Sikang. The average population density is at least three hundred per square mile, the actual density being higher within the Red Basin but lower in the mountains. Thus in size and population, Szechwan occupies an intermediate position between Italy and pre-war Germany.

The Red Basin and its borders

The whole of Szechwan drains into the Yangtze Kiang or its tributaries, and the province is in a general way basin-shaped, being lowest where the main Yangtze valley runs, rather to the south of the centre, and highest around the borders. The mountainous borders consist of ancient rocks, but most of the floor of the basin is made up of reddish, Cretaceous, clay-shales and sandstones. They give the landscape a predominantly red colour, a little like that of the Old Red Sandstone or the Keuper Marls of Britain, though with a distinctly purple tint. Thus von Richthofen coined the name of Red Basin, which was so aptly descriptive that it has been used ever since. Soil scientists

[1] "The geography of post-war air routes: Discussion" (*Geogr. J.* 103 (1944) 89).

Red Basin: eastern border, Windbox gorge, Yangtze Kiang, near Fengkieh

Red Basin: western border, Omei Shan, Wanfuting from Chinting

however emphasize the purple tint of the soils, to distinguish them from the tropical red earths, which have entirely different properties. They classify the soils as belonging to a Purple-brown Group. Indeed, after living within the Red Basin for a while, I felt that perhaps W. H. Hudson's "the Purple Land" might describe Szechwan as well as the part of South America for which it was used.

The basin shape of the province can readily be appreciated from the sketch-map. This shows the lower land in the centre and the mountains around the borders, as well as the manner in which the mountains close in on the Yangtze river, so that it both enters and leaves the province through deep valleys and immense gorges.

The floor of the Basin is usually far from level (with the single exception of the Chengtu Plain), but it is relatively low everywhere except in the occasional anticlinal ridges. The sides of the Basin are not always very high; the lowest pass would be about 4500 feet, but the western ranges rise to 20,000 feet and more where they border the Tibetan plateau. Even where the mountains around the basin are low, as in some parts of the north and south, the country is very complex, with range after range of hills and mountains, and deep valleys between. Thus road-making is a matter of great difficulty, and the roads could be easily defended, even against a mechanized army.

The western border ranges make up a fascinating complex of deep valleys and high mountains. They adjoin the Szechwan–Sikang border, and mark the eastern edge of the Tibetan plateau; in this region the average altitude of the plateau is around 15,000 feet and the crest of the border ranges is 17,000 feet or over, with a few lower passes of some 15,000 feet. Many of the peaks are snow-capped all the year, while Minya Konka, 24,900 feet, with its glaciers, although lying in Sikang province, is a part of the same general system. There seems to be no one name for the whole mountain system; they might well be called the Sino-Tibetan Alps, except that a similar name was used earlier by Gregory for the ranges in or near north-west Yunnan.[1] The really high peaks and ranges stand back at a distance from the Red Basin, and at the edge of the Basin there are lower mountains or ranges of some 10,000–13,000 feet in height. The best known of these is the beautiful Omei Shan, 10,200 feet, near Loshan (Kiating), a mountain sacred to the Buddhists and a scene of pilgrimage with many temples. One can stand on its summit, looking towards the sunrise, with sheer cliffs dropping for a mile and all agricultural China stretching eastwards to the sea.

The Yangtze is already a large river when it reaches Szechwan, being about half-way between its source and the sea. Its major tributaries are also large rivers; the name "Szechwan" (Four Streams) refers to the four largest rivers, Kinsha Kiang (the Upper Yangtze), Min Kiang, To Kiang, and Kialing Kiang. In the past the chief way into the province was by boat up the Yangtze river, and this route is one of great difficulty because of the rapids and immense gorges. The river is subject to violent floods in the summer (the wet season), when it may rise 50 feet in a night, or even 100 or 200 feet in the gorges. During these floods large amounts of mud are carried down to the sea or to the alluvial plains of east China: it has been estimated that 300 million

[1] J. W. Gregory, 'To the Alps of Chinese Tibet.' London, 1923.

tons of silt per year are lost from Szechwan and carried down these gorges, equivalent to the erosion of 300,000 acres of good top soil.

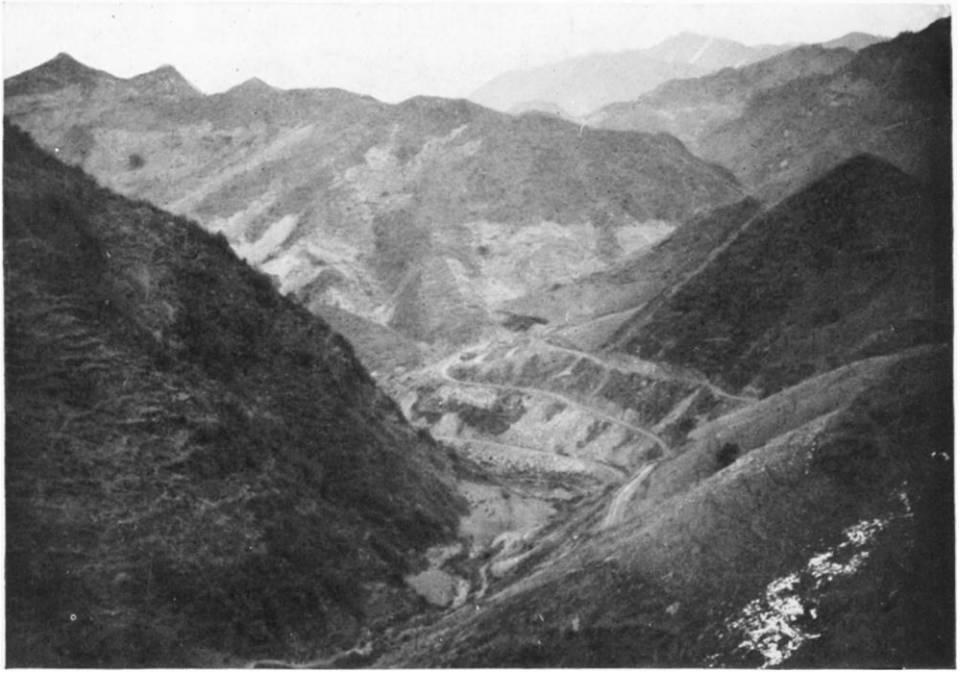
Within the Basin most of the land is cultivated, but in the mountainous borders there is much uncultivated land, generally under scrub or small trees. Few forests remain, except in remote mountain regions. The climate of the Basin, which lies around 30° N., is classed as warm temperate: it becomes quite hot and humid in the summer, while winters have occasional frosts and very rare snow. The rainfall of the Basin, averaging around 40 inches per year, is higher than would be anticipated in such an area of low land, far inland and entirely surrounded by mountains, but there are occasional dry seasons, especially spring droughts, which lead to partial crop failures. Any famines that follow are only local however; it is this fortunate combination of a mild, moist climate with an inherently fertile soil that has made it possible for the Basin to support so large a population, and thus to endure the war years with only negligible food imports from outside the province. Another feature of the climate is its cloudiness. For long periods, especially in the winter, there is a roof of cloud over the Basin which protects it from the frosts and the evaporation that would otherwise lower the yield of winter crops. The cloudiness of Szechwan is well known to the rest of China, which has a saying that "In Szechwan, the dogs bark when they see the sun" (as they would bark at any other stranger).

The irrigation of the Chengtu Plain

The Chengtu Plain, as well as being the only extensive area of level land in the Red Basin, is also the most productive. In origin it is a piedmont alluvial plain, and it slopes gently towards the south. Within an area of some 40 miles by 50 miles it supports a population of about five million people, and four million of these live directly on the land: a farming population of two thousand per square mile. This must be nearly a world's record; it is also a very valuable thing for Szechwan to have such a large, relatively prosperous, population which is unaffected by drought. The immunity from drought and flooding depends on the ancient irrigation system of the Plain. This is perhaps the most remarkable in the world, apart from that of the Nile valley, because it was installed about 300 B.C. and has continued to function ever since. The water comes chiefly from the Min river, where it leaves the mountains at Kwanhsien, although other smaller rivers also contribute.

At Kwanhsien the main intake of the system consists of boulder banks that split the Min river into two parts, along with an adjustable barrage of timber. A mile or so downstream from this is a permanent intake channel which has been cut through a neck of hard conglomerate rock, a sort of natural concrete. This channel has endured ever since it was first cut, and it controls and defines the flow of the river waters that enter farther upstream. Every year, in late winter when the flow is at its lowest, the water is temporarily barred off from the main canal; any gravel deposited is removed and the channel is cleared down to the level of a set of metal bars embedded in the hard rock; any silted channels in the rest of the system are also cleared. Then, at about our Easter time, the barrier is re-opened with great ceremonial, in which the governor of the province takes part—The Opening of the Waters.

Red Basin: near the centre, rolling country, Neikiang



Red Basin: northern border, north of Kwangyuan

The two thousand year-old intake of irrigation system at Kwanhsien: Elephant's Nose temple

Bifurcation of minor irrigation canals on the plain, near Chengtu

Below Kwanhsien, the water is distributed through countless bifurcations of the canals, and of the rivers that have been embraced in the system; the minor canals also anastomose and flow into larger channels, from which water is again taken off, so that the irrigation channels are thrown over the great plain like a net. The endurance of the system may be traced to two things: the intake cut in solid rock; and the faithful observance of a message left by Li Ping, who founded the system so long ago. His message, now engraved on the wall of the Erh Wang Miao Temple that overlooks the upper intake, says "Deep dig ditch, low make bank"—Dig the channels deep and keep the banks low, a slogan that might well be adopted by large irrigation systems in other parts of the world, where a burst canal bank sometimes brings much trouble.

Town and village life in Szechwan

Compared with east China, Szechwan was a backward province before the war; the amount of dirt and disease, the insecurity of life, the rough manners of the people, and their often poor way of living, shocked the "down-river" Chinese when they came to Szechwan early in the war. Country life had for centuries continued along the traditional lines, and in many ways it still does so: astrology and magic, devils or ghosts and exorcisms; religious, wedding, and funeral processions; dragon processions for rain—such things made up a large part of the life and entertainment of the country folk. The position of women however improved after the revolution; in particular, foot-binding had ceased by the 1920's. Further the organized religion of the Buddhist, Taoist, and Confucian temples lost much of its grip. The temples themselves were often taken over by the military or civil power, for headquarters, offices, or schools; the land-holding temples lost much of their land; and temples not taken over were usually sadly decrepit. The most prosperous and best-kept temples were those in the western mountains, particularly at Omei and Kwanhsien, which served as hostelries for pilgrims, and summer resorts for visitors from the plains. These have maintained and even increased their prosperity during the war, because more of the wealthy official class, especially the people from "down-river," have been using them as summer resorts.

The phrase "down-river people" is constantly in the mouths of the Szechwanese: it is illuminating as indicating the importance of the Yangtze river route into and out of the province. It suggests too the "insular" mentality of the Szechwanese people, which has made the path of the Central Government much harder during the war years. Especially in the earlier years of the war, the people from east China looked down on the Szechwanese, and the Szechwanese did not like them very much either. However, further acquaintance, and the knowledge that there was Japan, the common enemy, to be resisted, tended to overcome these differences which were, after all, mainly superficial.

Szechwan differs from some other parts of China, particularly the north, in that the closed or walled type of village, in which most of the farmers there live, is little developed. Farmers usually live in separate farmsteads, on their farms, scattered about the countryside. Villages exist as shopping centres or places of rest for porters or other travellers, as well as places where farmers may meet at a tea-shop. The larger villages are in fact market towns;

and of market towns in turn there is a great range, from settlements of a few dozen houses to large cities. One common characteristic of all except the largest towns is the tendency to be strung out along one or two main streets, very like an old English village.

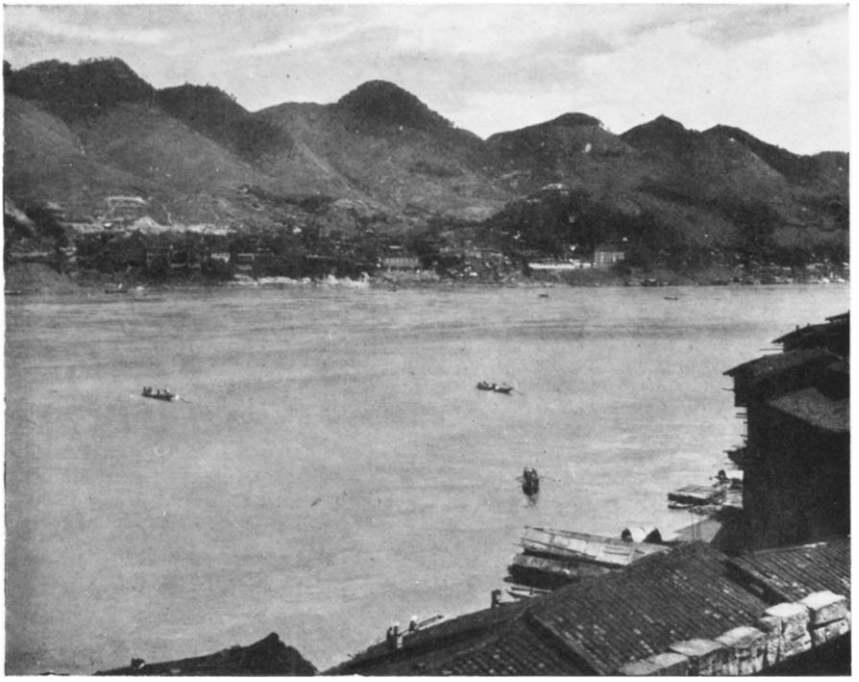
As might be expected from the relatively dense population of the Basin, towns and even cities are numerous; there are something like one hundred and fifty *hsien* or counties, each with its own county town: and this is often quite a large town with a population measured in tens of thousands. It surprises the traveller at first, how often, after travelling for long distances that may appear to be off the beaten track, he will come to a large and flourishing city, more or less self-contained and independent, prosperous and stocked with merchandise. Most of these large cities are on the great rivers, which have supplied the chief means of transport of heavy goods until the last decade. These cities have a life of their own, although they have been more affected by the war situation than has the countryside. Roads have now been built to them; secondary schools and research stations have been installed; other modern ideas, including police systems, wider streets, electric light, some modernized shop-fronts, government-sponsored newspapers or news sheets, and intensive war propaganda, have followed. Some have become the site of wartime manufactures, including arsenals; some have suffered severely in air raids. The old cities were always walled, but gaps have been made for air-raid exits during the war.

The total population of these large towns and cities is no more than a fifth of that of the province as a whole; four-fifths of the people live either on the land or in small rural villages. To these the war has brought much less change, apart from the conscripting of their sons for military service, and wartime modifications in taxation. Small primary schools have been introduced widely through the country, often in old temples, as well as in the cities; and there is some wartime propaganda; but it may be doubted whether the war plays a big part in the thoughts of these country people. Their problem, like that of all peasant communities, is first to cultivate the land, and to live.

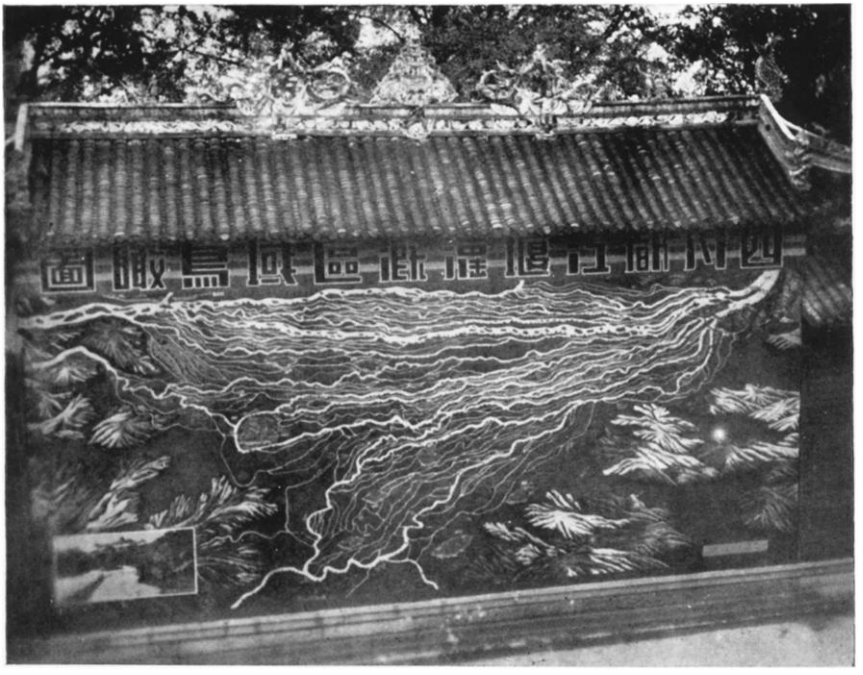
Much of the country people's time is spent on their farms; much is spent also at market and in the tea-shops which are a feature of all Szechwan life. These tea-shops are social centres, places of bargaining and business, and even temporary courts of justice, in which small local quarrels are tried and adjusted by the neighbours, according to immemorial custom. For a while, it was said, the Central Government tried to suppress the Szechwan tea-shops, as being places where too much time was wasted: but they still survive undiminished.

It may be noted that there is a good deal of informal democracy in the administration of local affairs in Szechwan, at the village or small-town level; but above this level, in the counties or cities and their major subdivisions, the administration is autocratic, in the hands of officials, including "hsien magistrates," appointed by the Provincial Government acting sometimes on the advice of the Central Government. In country districts the inhabitants are still very much at the mercy of a bad official, just as they may benefit from the self-sacrificing service of a good one.

My introduction to Szechwan was seeing the stoning of a corrupt magistrate at a border town of the province. After sleeping the night at the town, we had



Yangtze Kiang at Chungking, looking towards south bank



Diagrammatic map of Chengtu plain irrigation system on the Erh Wang Miao temple, Kwanhsien

Hoeing stubble

Szechwan plough
Farming near Chengtu

Threshing rice

to ferry across a river in order to proceed next morning; we were held up there by a mob of townspeople who were anxious to make sure that the magistrate was not on our vehicle. Later the magistrate came down onto the beach of the river (with a small escort of soldiers), and by dint of firing his revolver in the air he progressed to the edge of the river. But when he tried to board a boat none of the boatmen would take him and the crowd threw stones at him, in a rather half-hearted fashion it is true. So finally he went back to the city. We heard later that a company of soldiers had been sent from the district headquarters to enable him to leave. His offence, in local eyes, was not simply that of taking "squeeze," but of unreasonable rapacity. The idea of the townspeople had been to get him to disgorge some of his ill-gotten gains before he left, his term of office having been completed.

Under the influence of the Central Government it is to be hoped that the number of such magistrates has decreased during the war; but it must be admitted that Szechwanese local politics are such that an honest and impartial magistrate may not have an easy time in certain districts; and if, as is almost inevitable, he antagonizes the local landowners and secret societies, he may be forced to leave.

Farming in Szechwan

Farming, as the occupation of four-fifths of the people, and the chief source of wealth of the province, deserves more space than it can be given here. However it is similar in many respects to the agriculture of other parts of central and southern China. An outstanding thing about Szechwan is the wide variety of crops, as well as of economic trees, which can be grown. It has been said, somewhat loosely, that every crop which is grown anywhere in China can be found in Szechwan: this is certainly true for the major crops and trees, although some frost-sensitive species, like pineapple, are not found there.

Rice is the most important crop, both in the area of land occupied (about half the cultivated area of the province) and in importance for food production. Many other crops are also relied on, to a greater or less degree, for food, especially by the farmers: these crops include wheat, beans of many kinds, and peas; sweet potatoes, maize, and pea-nuts; Irish potatoes in the mountains; garden vegetables; barley and various minor cereals, and condiments. Oil seeds, notably rape-seed, are important for cooking and illumination (especially in wartime); economic crops include cotton, sugar-cane, tea, mulberry, tung oil, tobacco, and various rather rare products such as indigo, lacquer-varnish, and the white wax which is derived from a scale insect. Green manure and fodder crops are also grown.

Within the Basin there is a clear distinction between winter and summer crops, most of the crops familiar to us in England being grown in Szechwan as winter crops. They are harvested in the spring, and summer crops are then sown—these are crops that will not usually grow or ripen in England, such as rice, maize, soy-beans, sugar cane, cotton, and sweet potatoes. Fuller data about cropping and economic plants in Szechwan are available from many sources, including Hosie's 'Three years in Western China' (1890),[1] J. L. Buck's 'Land utilisation in China' (1937), and the present writer's monograph

[1] Also A. Hosie, 'Szechwan: its products, industries, and resources.' Shanghai, 1922.

'Soils and agriculture of Szechwan' (1942). With reference to Buck's valuable account, it may be pointed out that in the early 1930's, when his field surveys were made, the opium poppy was an important crop in Szechwan, occupying no less than 11 per cent. of the crop area each winter. The growing of opium has been entirely suppressed in Szechwan in recent years, by the strict measures enforced by the Central Government, and its place has been taken by rape-seed, wheat, or other food crops. This has doubtless contributed to the favourable food position of the province during the war.

Although double-cropping (growing two crops in the course of the year) is common in Szechwan, much of the land grows only one crop, notably the rice-paddy fields which are kept flooded in winter, unless a source of irrigation water is available. The "double-cropping index" for the province is only 167 per cent., *i.e.* about two-thirds of the cultivated land grows two crops in the year. Travellers' tales about three or even five crops being grown annually can only apply to very special and unusual conditions, such as market gardening. There is however a good deal of mixed cropping: that is to say, growing two or more crops in alternate rows. Cereals and leguminous plants, in particular, are grown in this way.

Cultivation operations are similar to those in other parts of China, so they need not be gone into in detail. The Szechwanese, like most other Chinese farmers, handle their fields very well for intensive cultivation, often planting seeds in separately manured "hills," rather than broadcasting them; transplanting rice and other crops from seedbeds; and keeping weeds down. Their cultural methods often reminded me more of market gardening than of English farming. Of course the farms are small (the average cropped area is 3·1 acres) and so are the fields. Much hand labour is used, both in cultivating with heavy hoes, and in harvesting with sickles. Ploughing is usual on the larger fields, the plough used on the Chengtu plain as well as other parts of the province being noteworthy for its simple and efficient design. The "beam" is a single piece of wood, cut from a tree trunk (trees are sometimes trained to the shape desired, or bent trees may be found growing wild); at its rear end a second, downward-pointing piece of wood carries a hand-grip at one end and the ploughshare at the other; the ploughshare is a simple iron blade, and a furrow is turned merely by tilting the whole plough to one side. There must be a nice balance of forces in the design in order to plough a good furrow in this way, but the result in the hands of a capable ploughman could hardly be bettered.

Mention may be made also of the simple method used in threshing rice: the sheaves are beaten directly against the sides of a square wooden tub, and this is sufficient to dislodge the grain, which collects in the bottom of the tub while the straw is put aside for later use. Rice straw has considerable value as a feed for buffaloes and other livestock, as a thatching material, and as a fuel.

Most crop residues are used in one or more of these ways, with the result that not enough is returned to the soil as manure, and there is consequently a shortage of organic matter in Szechwan soils, like those of most other parts of China. The usual manure employed in Szechwan is diluted night-soil; animal droppings are also used, but they contain little in the way of bulky litter (as does English farmyard manure), and when they are composted by

the farmers they are mixed with ashes or earth, not with straw. Other waste products, including oil-seed cakes and bone meal, as well as ashes, are used as manure, but the supplies are small. Consequently, although average crop yields in Szechwan compare favourably with those, say, in India, they are considerably below the English level for comparable crops.

The Red Basin of Szechwan has an almost legendary reputation for its fertility, but as in other legends there has been some exaggeration. To take a representative crop, the average yield of wheat, in Buck's survey, was 23 bushels per acre, which is higher than the average for most of China, but far below that for Britain. Farmers maintain fertility to the best of their ability by the use of the limited amounts of local manures, but there is no way of increasing these substantially. The high fertility of the Chengtu Plain depends on the regular water supply and on regular additions of silt from the irrigation water, as well as on manuring; the continued productivity of the other soils of the Basin is due to the fact that in spite of heavy erosion, the subsoil materials and parent rocks (soft shales and sandstones) readily weather into fresh soil, fairly well supplied with mineral plant foods. With these basic factors to help them, the farmers have been able to maintain the fertility at a moderate level. But if it had not been for the softness of the rocks of the Red Basin, and the ready formation of new soil, Szechwan would have been little more productive than the other hilly provinces of south China. Field experiments carried out during the war have shown that large increases in crop yields can be brought about in Szechwan by the use of artificial fertilisers, in addition to the local manures, and it is likely that after the war these fertilisers will be both imported and manufactured within the province.

As might be expected from the small size of their farms, Szechwan farmers are poor in comparison with those of parts of the world where larger farms are the rule. Their condition has however very noticeably improved during the war, under better government than that which they enjoyed previously. In the 1920's and early 1930's, under a succession of rapacious war lords and their armies, with occasional civil wars, the farmers were reduced to a very low ebb; taxes, for example, were collected for thirty or fifty years ahead. When I first reached Szechwan in 1938, the Szechwanese farmers appeared poorly clad and under-nourished in comparison with those of some other provinces. During the war years however although fairly heavy taxes had to be imposed they were not so heavy as those of the old war lords, or at least they were collected more equitably. Prices also have been at a high level, and even when the catastrophic rise in prices took place which has imposed so much hardship on the educated classes, the farmers on the whole benefited rather than otherwise. Probably the chief hardship felt by the Szechwan farmers as the result of the war has been the conscripting of their sons into the army. This, of course, was unavoidable; but in spite of the conscription one has the impression that the man-power of Szechwan has suffered relatively less depletion than that of Britain or the British Commonwealth.

Local industries

Before the war, Szechwan had practically no large industries or modern factories, the nearest to a large industry being the preparation of salt from

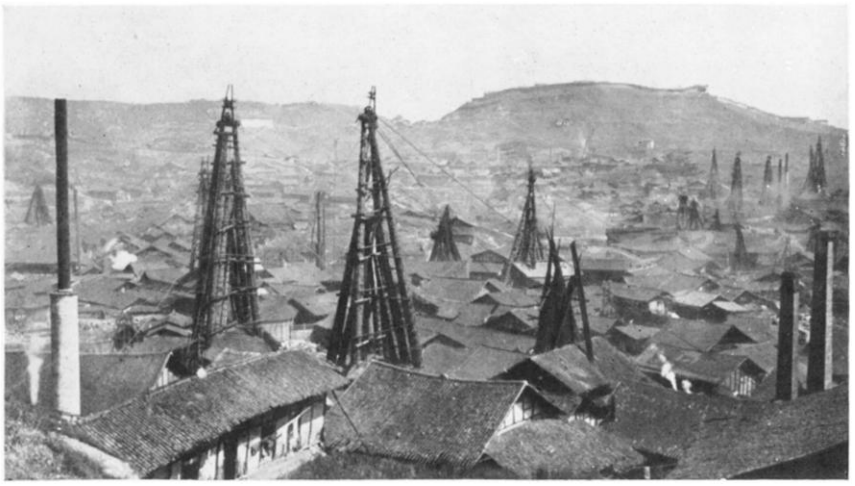
brines found underground in various parts of the province. There was, on the other hand, a considerable range of local industries and crafts, carried on in a small way with human labour. Iron, copper, and lead were mined and smelted; gold was washed out of the sands and gravels of the great rivers; coal was mined in simple shafts, and coke was burned like charcoal in outdoor heaps; charcoal itself was prepared by burning scrub or saplings; lime was roasted; potash was prepared by burning the cut growth on meadows in the western mountains, and leaching the ashes; nitre or salt-petre was prepared from nitre-impregnated earth, found in old courtyards or walls; sulphur was obtained by roasting sulphide ores. These, with the salt, were the foundations of chemical and metallurgical industries in the province. Every city or large town had its own blacksmiths, coppersmiths, and manufacturers of pewter-ware; earthenware and rough porcelain were produced in various parts of the province; cabinet makers and lacquer-varnishers were to be found in every town. Compared with north and east China, the general level of craftsmanship was poor, but the products were serviceable or easily replaced. Much ingenuity was displayed in the use of bamboo, not only in house building and for making furniture, but for less conventional uses such as long, strong ropes for hauling junks up the rivers; and for the straps, buckets, and pipes employed in the salt industry.

Spinning of cotton or silk (wool was almost unused before the war) was mostly carried out at home, as a spare time occupation for both farm and town women; weaving was done on small hand- or foot-power looms. Cotton fabrics were usually rather coarse and rough, but some very fine silks and brocades were made, and elaborate embroidery of more than one type was worked. In addition to the usual highly-coloured dragons embroidered on silk, there was a very interesting class of "blue-thread work" done in cross-stitch on cotton, a peasant art with an entirely different conception of design.

Thus practically everything in everyday use in the province before the war was made locally: the most noteworthy exceptions were enamelled basins, paraffin or kerosene lamps, thermos flasks, electric torches, and toilet soap. In the bigger cities too there was a fair range of manufactured goods brought up the Yangtze river from Shanghai. Already before the war a few steps had been made to introduce larger or more efficient factories: for example steam-power electric light plants, silk filatures, arsenals for local war lords, and one modern iron and steel smelting plant. Political and other uncertainties had however prevented these from going ahead or developing to any degree.

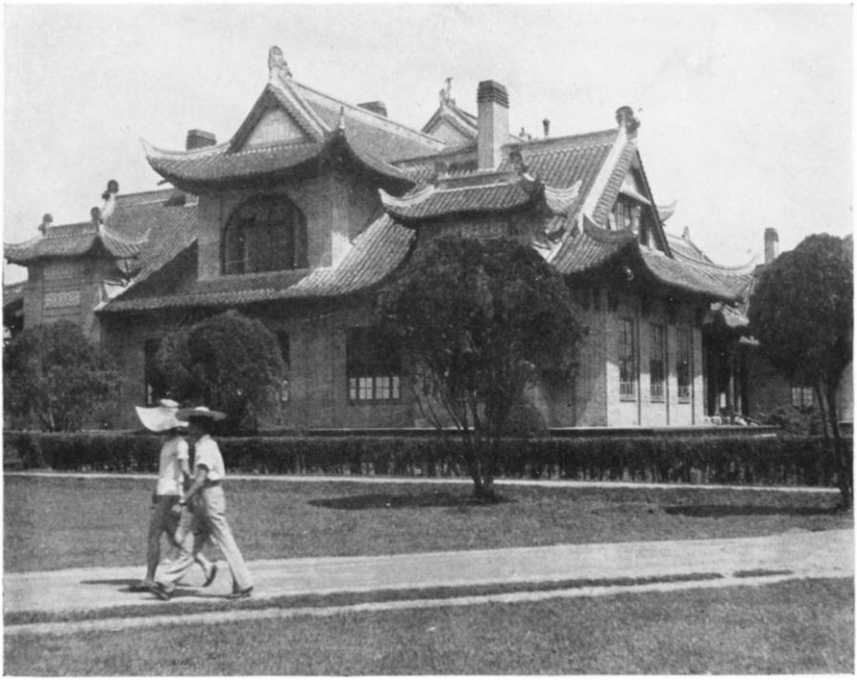
At the beginning of the war in eastern China great efforts were made to transplant factories and equipment from the north or east to Szechwan. Appreciable amounts were brought in, although transport difficulties were immense; an industrial suburb has grown up near Chungking, but it has not proved possible to build up anything like the degree of industrial production existing in Shanghai and Hankow. One difficulty was that with the ever-tightening Japanese blockade, the heavy machinery, which had to be imported before a start could be made, was prevented entry or was cut off in transit. Another trouble was the ever-rising price level, which finally involved a

Bus crossing To Kiang by ferry, near Neikiang



Brine wells and salt factories, Tzeliutsing

Interior of salt factory: evaporating brine by heat from natural gas, Tzeliutsing



West China Union University, Chengtu: Administration building, with students

Szechwan tea-shop, Laochunchang

fantastic level of capitalization for even a moderate enterprise, and produced an equally fantastic wage bill. The great amount of human labour employed in Szechwan for mining, transport, and at every stage of the process even with a modernized industry, aggravated the situation. I was told, for example, that a steel works of quite moderate capacity had to close down because, in all, it required the labour of fifty thousand coolies to keep it in production.

Thus, while some modern-type factories were certainly established in Szechwan during the war, including arsenals, cotton-mills, heavy chemical works, and alcohol distilleries (for power alcohol), the degree of development was nothing like sufficient to run a modern war. Smaller industries involving only hand labour were much more successful, and in the course of the war it became possible to buy many household goods of modern type, such as tinned foods and condensed milk, woollen goods, electrical equipment (including lamps, torch batteries, and even transformers), glassware, and scientific instruments, which were not made in Szechwan before the war. Private enterprise had a considerable part in this, and so also did the Chinese Industrial Cooperatives, about which much has already been written. The Cooperatives undoubtedly did much to raise production directly in the early years of the war, and also to stimulate the production of new products by private enterprise, but in later years they met difficulties of an administrative and political nature. They also were hard hit by the effects of rising prices, including the necessity for heavier capitalization.

Transport

The old roads of Szechwan were foot-paths or mule tracks, usually paved with a narrow pavement of stone flags: "Good for ten years and bad for ten thousand," as the Chinese saying is. These roads still survive throughout the province, and they still carry much traffic of the traditional pattern: coolies with carrying-poles, foot-passengers, and passengers in litters or sedan chairs (*huakans*), occasional mule-trains (rare except in the mountains or near the salt mines), and wheelbarrows—the last-named restricted to the plains. These old roads were used chiefly for local journeys or for the local distribution of goods. Longer journeys, and especially the distant transport of heavy or bulky materials, were made by boat. The pattern of large rivers in the province and their tributaries, as well as the larger canals on the Chengtu plain, made water transport the method of first importance, as it doubtless has been for many centuries. All heavy goods that came into the province came up the Yangtze river, through all the gorges and up all the cataracts.

To travel on the old roads, or on the rivers, by the ancient means is the way to get to know Szechwan. A motorist on the new roads, provided he is not unlucky in the matter of breakdowns, may leave a comfortable house one morning, lunch in a good restaurant, perhaps spend the night at a decent guest house, and next day arrive at his destination. He learns little about the realities of every-day life in the province. But travelling slowly across the country, on foot or by litter, drinking green tea in tea-shops once an hour, eating odd meals in little food shops, and spending night after night in odorous, unclean inns: this is to learn how the ordinary people live. On the way, one may stop to talk to farmers and visit their farms; during the halts,

or at night, sick people come to beg treatment or medicine (which most Western travellers carry with them); while travelling there is time to look at every field and to estimate the condition of the soil and the crops.

Modern transport has come late to Szechwan. Not until after the 1914–18 war did motor roads appear, and there is still no railway in the province, although a beginning has been made in constructing the road-bed for one. Areoplanes reached the province before trains. The first motor roads began to be built by progressive generals in the 1920's. At first these roads ran only within the province, and they carried little motor traffic except a few broken-down buses, although they were largely used by the old forms of transport, and rickshas started to appear. When the Generalissimo visited Szechwan in 1935, and began to form plans for using the province as the heart of Free China in the event of Japanese attack, he undoubtedly stimulated the whole road-building programme; notably the construction of the long and difficult roads over the mountainous rim of the Basin. The result was that just before the present war began, it was already possible to reach Szechwan by motor road from the north (Sian (Changan) and Nancheng (Hanchung)), or from the south (Kunming or Kweilin and Kweiyang), and to motor from Chungking to Chengtu as well as on various subsidiary routes.

During the war, road building continued steadily and some great feats of construction, fully comparable with the Burma Road, have been carried out. In consequence there are now other roads connecting Szechwan to the south (particularly a more direct way to Kunming, via Luhsien (Luchow) and Weining), to Sikang, and to the north, as well as quite an extensive network of roads within the province. However road surfaces are poor; the major roads have a macadam surface, but they are always badly potholed; and minor roads are simply dirt tracks, with a most exasperating absence of bridges or presence of broken culverts. Farmers on a minor road, too, often cut ditches across the road to carry water to their rice fields. To give an idea of the nature of the surface, it may be mentioned that the first two jeeps that travelled over the main road from Chungking to Chengtu were both held up by broken springs.

Early in the war, especially when supplies began to come in freely from the U.S.A., motor transport was quite well developed in Szechwan. Private or official cars were common, motor-trucks, both public and private, were still more numerous, and motor-buses flourished although by our standards they were uncomfortable and overcrowded. However even then there were frequent delays—including those due to ferrying over rivers, none of the larger rivers being bridged—and breakdowns were common as a result of the lack of experience of drivers and mechanics. Most trucks carried both a driver and a mechanic: the driver would drive, but would not do repairs; the mechanic, if willing, was rarely capable; only too often he was unwilling, or the tool-kit was so deficient that he could do nothing.

There was also a regrettable frequency of accidents, as travellers on the Burma Road have recorded. I speak feelingly, as I had to spend two months on my back as the result of a motor truck, on which I was a passenger, overturning. Most other members of my Department in the Agricultural Research Bureau had also been involved, as passengers, in road accidents, some with

serious consequences. Agricultural research necessitates much travelling, and we began to say that road accidents were the "occupational risk" of agriculturalists.

These accidents were largely due to inexperience and rashness on the part of the drivers: most of them had probably never seen a piece of heavy machinery until they started to drive; and, in particular, they failed to appreciate the powers of momentum. But perhaps the wonderful thing is not that there were so many accidents, but that large-scale motor transport was carried on at all.

Other forms of road transport developed also, making use of the motor roads: rickshas travelled surprising distances on long cross-country journeys —a single puller would travel 100 miles in three or four days, or by changing rickshas one could make even better time. Mule carts began to be used, especially those coming in from Shensi with cotton; and "flat-carts" pulled and pushed by several sweating, but cheerful, coolies took part in both short and long hauls. Curiously, horse-transport for either goods or passengers was late in appearing, but by mid-1943 there was a brisk service of pony-carts carrying passengers between Chungking and its suburbs, and after negotiation someone might be found willing to make the whole journey from Chungking to Chengtu.

It was fortunate that these alternative forms of road transport developed, because as the war progressed motor transport declined and became less and less reliable. The vehicles always did wear out rather rapidly under Chinese conditions, without adequate care or workshops; this did not matter so much when fresh vehicles were coming in from outside, but once the Burma Road was closed the number of vehicles on the roads steadily fell. Transport by road became correspondingly hard to get, and the journeys were still more frequently delayed by breakdowns.

Motor fuel was also a difficulty, but from early in the war the Central Government had given much attention to encouraging local sources of production. Although petroleum is said to occur in association with the brines of Szechwan, very little has yet been produced or refined. On the other hand, the production of power alcohol, in the first place from molasses, reached large proportions. In fact there was a regular boom in alcohol factories (built from local materials, with the help of steel from oil drums): the production of alcohol outstripped consumption, so that some of the firms went bankrupt. Local vegetable oils, including rape-seed oil and tung oil, were put through a "cracking" process to yield motor fuel, and they were also burned directly in diesel engines. Charcoal or converter gas units were also attached to many trucks and buses. They suffered from two disadvantages: low power on the numerous hills; and rather rapid corrosion of engines, unless very efficient filters were fitted and kept in good condition.

The old standby, water transport, was not neglected during the war years. At first it suffered from competition with the more speedy motor transport, but as the latter declined, water transport came back into its own for heavy goods. During the war there was a government programme for constructing more junks to serve on the rivers of the province, and the service of small steamships and motor vessels above Chungking, which already existed before

the war, was augmented by vessels that came up from the lower Yangtze when that route was closed.

Transport by air had started before the war: a few airfields had been constructed in the province during the early 'thirties and there was a regular service from Chungking to Hankow and Shanghai. The air services were considerably enlarged as soon as the war developed and Szechwan became the centre of the Government; for some time both Eurasia (with German backing) and the China National Aviation Company (C.N.A.C., with American backing) ran regular routes; later, Eurasia practically dropped out. Chinese airlines have as good a record for safety as those anywhere, thanks to rigorous inspection and perhaps to some degree of foreign control; experienced Chinese airline pilots proved fully as capable as those from abroad. As the war went on, and planes wore out, the air services became somewhat contracted; at the same time the decline in road transport meant that more people wanted to travel by air; thus unless one had an official priority it was necessary, as in other countries, to book far ahead. There was a saying that if you were really in a hurry to go anywhere, the quickest way was to walk: it might take a week or two, but you would be sure to get there within that time. If you wanted to go by bus, you might have to wait a fortnight for a ticket and then spend a week on the road because of breakdowns; if you flew, the journey would certainly take only an hour or two, but you would have to wait a month for a place on a plane.

Despite its safety, air travel in Szechwan offers some excitement. The landing-field at Chungking, for example, which is used when the river-level is low, is no more than a single long paved strip on the gravel beach of the river. The river lies at the bottom of a deep valley, with hills rising 1000 feet not far away; the hills are quite often under cloud, while in the other direction, high-tension power lines span the river. Approaching and leaving Chungking by air under these conditions is liable to produce a feeling of suspense in the passenger. On one occasion, I was travelling in a small flying-boat on the upper Yangtze; after calling at a certain port, there was only one direction in which the plane could take off, because of the formation of the hills; this direction happened to be against the current of the river, which was in spate. Some distance upstream was a fair-sized cataract or rapid, and the plane made two futile attempts to leave the water, in the course of which it bumped over the cataract in the most alarming fashion, before finally getting into the air at the third attempt. However although the flying-boat looked decrepit, it held together and the pilot kept his head, and all was well.

The construction of military aerodromes proceeded apace during the war years, notably on the Chengtu Plain. The almost level but well-drained surface of the plain proved ideal for aerodromes, though some of the local farmers were bitter at the loss of good rice land. In the earlier years of the war there were not sufficient planes and pilots to make full use of these fields, but they were constructed with a definite eye to the future, and it is no secret that some of the early Super-fortress raids on Japan took off from Szechwan aerodromes. If sub-stratosphere flying becomes a regular thing, the direct route between India and Chengtu, across the Sikang Plateau, may become important, for it is only a matter of 500 miles.

Recent history in Szechwan

It is frequently said that the Chinese Revolution of 1911 started in Szechwan, though it started there in a thoroughly Szechwanese fashion: a railway to Szechwan up the Yangtze valley had been proposed, and indeed a railway station and a memorial pillar were constructed. But the Manchu Government wanted to build the railway in its own manner, and the Szechwanese did not want a railway unless it was financed and managed by Szechwan; tempers grew warm, fighting started, the Manchu governor of the province found that he had more than he could handle; the trouble spread to other provinces, which were already ripe for rebellion, and the Dynasty fell.[1]

After that there was a long period of turmoil in Szechwan province, while rival Szechwanese generals and some from outside provinces struggled for power. On one occasion Szechwan was invaded by a Yunnanese army; civil war flared up and died down again at intervals; there were occasional anti-foreign outbreaks. It was an unhappy period for Szechwan, and helps to explain why the province was relatively so backward at the beginning of the Sino-Japanese war. Generalissimo Chiang Kai-shek and his government had little authority in the province until 1935, when the communist bands, on their "Long march" from Kiangsi to Kansu and Shensi, passed through the mountainous borders. Then the Central Government brought in troops, built block-houses and forts, ordered more roads constructed, and generally, while pursuing the communists, contrived to assert its authority and bring order to the province. The position was still an uneasy one up to the outbreak of the Sino-Japanese war, simultaneously with which the then governor of the province (the most successful of the war lords) died of heart trouble. This and the transfer of the capital from Nanking to Chungking simplified the task of the Central Government in securing effective control of the province.

The provincial capital remained in Chengtu, even after Chungking became the national capital. The governor of the province was nominated by the Central Government, but he had to be a man acceptable to the Szechwanese leaders, and there was also a military governor, or "Pacification Commissioner," in the person of the best of the old war lords. Even during the war years there were occasional mutterings of discontent from the old provincial authorities, and a few minor incidents reached the surface. The need to deal delicately with the matter of provincial autonomy (some of the other provinces being even more troublesome than Szechwan in this respect), must have immensely complicated the war problems of the Generalissimo and the Central Government.

Szechwan politics are remarkably complicated. In the absence of representative government as we know it, much goes on beneath the surface, or finds expression through pressure groups, and no one from abroad can be expected to know all the ramifications. There are however still some generals left over from the old war-lord days who retain, if not private armies, at least large groups of soldiers under their personal control. There are also secret societies, notably the so-called "Long Gown Brotherhood" or *Ku-lao-huei*;

[1] S. C. Yang, "The revolution in Szechwan, 1911–12" (*J. West China Border Research Soc.* 6 (1933–34) 64–90).

their function varies even in the same organization between that of a Friendly Society in the English sense, and something like the Italian Camorra. The secret societies are not just an invention of the imaginative traveller; they undoubtedly exist, and have a large and influential membership throughout the province. They take a considerable hand in local politics, including making things easy or difficult for a new magistrate; they are not always free from suspicion of complicity with local bandits. Another, perhaps not altogether distinct, political group is that calling itself "The Szechwan Gentry." These are mostly large landowners, including some retired war lords who have gone in for land-owning. They represent the most conservative element in the local society, and, of course, they strongly protect local interests: their influence is said to have been marked at the time of the railway revolt.

These represent the forces in the background, which have to be opposed or conciliated when the Central Government wishes to introduce a greater degree of central control or other new measures. They may have considerable influence on the conduct of local government within the *Hsiens* or counties, even if the *hsien* magistrate happens to be a Central Government man. Their influence would also have to be taken into consideration in connection with any introduction of suffrage and extension of democracy in the province. They are, for example, strongly anti-communist, and any attempt to set up democratic party government in China, with the communists as one party, might meet with trouble from these Szechwanese groups as well as from the Kuomintang.

Perhaps it would be kinder not to say too much about banditry in Szechwan, since its prevalence must be attributed in part to the fact that the good soldiers are at the front, and bandits can only be suppressed with the help of good, well-armed troops. After the war, when such troops are available, the bandits may be quickly put down. It must be recorded however that there are bandits throughout the province, even on the closely settled Chengtu plain. On the more travelled routes, which are better guarded, they only molest an occasional traveller, especially if he has the bad judgment to be out after dark; but in more remote and mountainous districts they form a real menace, and there are places where it is not safe to travel without a guard; even some places where a small army is necessary for safe conduct.

In point of fact, the average English traveller avoids the worst places, and takes a chance on the others. In any case, Western travellers are less often molested than Chinese, perhaps because the courtesy of the Government is such that on the few recent occasions when Europeans have been robbed or injured, there has been much trouble for the bandits.

Life during the war

In spite of these local troubles, left over from the bad pre-war years, Szechwan has undoubtedly made a big contribution to the war of resistance against Japan. The province has supplied considerable numbers of troops, to reinforce the army's man-power, and it has been a source of military supplies. Despite its limited resources, it has supported a large number of refugees from east China, in addition to the Central Government itself. If the Central Government had not had Chungking, defended by its mountain ranges, to

come to after Hankow fell, it may be doubted whether they could have carried on the struggle.

Chungking, and life in Chungking, have been so often described by visiting correspondents that there is no need to say more about it here. Life there was lived under curious, difficult, and crowded conditions; but Chungking could not be considered representative of wartime Szechwan, any more than living in any other capital under constant air attack is typical of life in the country as a whole. Less so, if anything, because of the preponderance of the rural population in Szechwan, and the relatively small population of the capital city itself.

The coming of the Central Government to Chungking, and the improvements in local administration that ensued, were in turn of benefit to the province. The conversion of Chungking almost overnight from a treaty port to the capital of China was a remarkable feat, and it made a great difference to the immediately surrounding country, while ripples of influence spread over the whole province.

Wartime propaganda was organized throughout the province, even in remote areas, and education in primary and secondary (or "elementary" and "middle") schools has had a pronouncedly nationalistic trend. The new generation of Szechwanese will have an entirely different outlook on national and world affairs from their parents. Slogans and inscriptions in giant characters several feet high are to be seen everywhere, on the walls of towns and temples and public buildings; dynamic posters are painted up on other walls; wall-newspapers and mimeographed news-sheets are produced in quite small towns as well as in the cities.

The Japanese themselves have contributed to the feeling of national solidarity by bombing the Szechwan towns. Early in the war the Szechwanese disliked the "down-river people," suggesting that if they had only stayed where they belonged the Japanese would never have threatened Szechwan. But after the air-raids began, and continued, the people of Szechwan developed a personal dislike of the Japanese, which must undoubtedly have contributed to the help they gave the Central Government.

Some of the raids were bad, by any standard. The history of Chungking is now well known; the centre of the city was practically obliterated; whole new streets were laid out when the city was rebuilt; to one returning to the city after the rebuilding it was quite hard to find the way. Chengtu did not suffer quite so badly, though entire city blocks and many smaller areas were destroyed; most of the chief cities of the province were bombed more than once, as well as some smaller centres. The city of Loshan (Kiating), an important river port, was completely wiped out within the city wall, by a single incendiary raid. But, as in other countries where there is a tough fibre of resistance in the people, the Chinese in Szechwan and elsewhere have promptly set to work to rebuild the bombed areas, using at first temporary materials; later building in brick or mud walls; and hoping after the war to build in concrete.

After 1941, the Japanese were so busy using their planes elsewhere, and the American pilots stationed in Kunming had made attacks on China so costly, that Szechwan had a relatively peaceful time from air raids. From then

on, the steadily mounting cost of living became the chief personal preoccupation of those living in Szechwan. Ever since the Japanese closed the Yangtze at Ichang, and so cut off the main avenue by which goods from the outside (notably rice) entered the province, prices had been rising more steeply than in the first years of the war. The rate of rise in the cost of living index could be expressed with quite remarkable regularity on a logarithmic curve: on logarithmic-ruled paper it was almost a straight line, ascending month after month with minor fluctuations. The average rate of increase was a little under 10 per cent. per month: prices on the average doubled every eight months, or tripled every year.

It was very interesting to live in the midst of a gigantic economic experiment that proceeded with such regularity, but after two or three years people wondered how they could possibly manage if prices did not begin to fall soon; and the prices just kept on rising. They rose from several times pre-war to tens of times, and then to hundreds of times, and the whole thing just became fantastic. Those who had goods and chattels to sell were fortunate: one could live for several weeks, for example, on a portable gramophone.

As always during inflation periods, those who suffered most were the educated people living on salaries—they received cost-of-living bonuses, but these were never more than a small fraction of the rise in living costs. Early in the war the standard of honesty among government servants seemed high, but as the fantastic rise in living costs continued, an official had to adopt any means that would enable him and his family to survive: some occupied a plurality of posts, some took "squeeze" on an ever-increasing scale. This naturally lowered the standards of honesty in government and opened the way for other forms of corruption, which helps to explain the state of affairs that has received unfavourable comment from correspondents in China during recent years. Students also suffered from the rising living costs and hence from undernourishment; because of this and overcrowding, tuberculosis claimed progressively more victims as the war went on.

Farmers, merchants, and coolies were not so badly off; their cash intake rose with the cost of living, and some of them kept a little ahead of it. Among such people there was a sort of false boom, while the professional classes were getting more and more depressed. Even in 1943, when the writer left, a ricksha coolie could earn more in a day than a University professor. Every credit is due to those teachers, professors, and research men who have remained at their posts in spite of these difficulties.

Education and research

These two subjects may conveniently be considered together, because Chinese universities and agricultural colleges combine research with advanced education to an outstanding degree, as has been shown by Dr. Joseph Needham's recent articles in *Nature*.[1]

Education is open to both sexes. It usually begins at the primary or elementary level, though there are Montessori or other infant schools in some of the cities. Elementary education can fairly be described as universal, but

[1] J. Needham, "Science in Chungking," and "Science in western Szechwan" (*Nature* 152 (1943) 64, 343, 372).

not compulsory. That is to say, there are numerous small elementary schools in remote country districts, often housed in old temples, as well as in the towns and cities. Nevertheless, there are many children, particularly those of poor parents in town or country, who do not attend school; and naturally in the early stages of a growing education scheme there are not enough qualified teachers.

Because learning Chinese characters by heart is a difficult and time-consuming process, even for Chinese children, the rate of education in the elementary schools seems rather slow, while the range of subjects covered and the breadth of their treatment is restricted. Geography, for example, receives little attention. On the other hand, there is much emphasis on the new nationalism of China, and on the struggle with Japan. Throughout the educational system, as well as in research stations, and government offices, a "Sun-Yat-sen memorial ceremony" is held on every Monday morning. At this, certain sayings based on his "Three principles of the people" are recited in unison, songs are sung, his portrait is bowed to, and an address or exhortation is given. Children trained in this mould from childhood will certainly have a definite trend given to their thoughts as adults, and this may be important in the post-war development and international reactions of China.

The next stage of education in China is there known as "middle school," equivalent to our secondary and public schools. Here, as is natural, education covers a much broader field than in the elementary schools; the sciences are prominent, in addition to Chinese literature and history; and one or more foreign languages, usually English, are taught. The emphasis on nationalism is still more intense, and middle school (male) students in general wear semi-military uniforms with peaked caps. The middle schools seem to have received the greatest degree of favour from the government during the war years, so that they have developed enormously; they are able to offer sufficiently high salaries to draw research workers away from research institutes, and even to attract staff from the universities.

It is from the middle schools that the great majority of young officials and elementary school teachers are recruited. The universities naturally contribute their quota, but their number of students is far from sufficient to meet the needs of the rapidly developing New China. Every city and large town or county (*hsien*) town has its middle school (more than one, of course, in the case of large cities), so that the brightest of the elementary school students can go on to the middle school without much difficulty, even if they live in quite a remote part of the province. There is also a limited number of "vocational schools," similar to our technical schools, which specialize in the teaching of industry or agriculture. Most of the middle and vocational schools are indigenous to Szechwan, although a few migrated to Szechwan like the universities when the Japanese advanced. One such is the Ming-hsien College, an agricultural school of high reputation which before the war was established at Taiku, Shansi.

The story of the universities in China is well known to the world. Rather than lose their independence under the Japanese they migrated great distances, often on foot and under appalling travelling conditions, in order to find a home in Free China. Often the students and staff arrived with little more

than the clothes they stood in, and perhaps a few boxes of books or precious equipment like microscopes. In west China the universities had to start again, frequently in makeshift buildings.

Many of these refugee universities came to Szechwan in the early months of the war, and most of them have remained there ever since. Chengtu in particular has become a university centre: before the war, the West China Union University (of mission origin) and the National Szechwan University were established there; during the war at least five other universities or university colleges have found a home there, notably on the hospitable campus of West China Union University. Among these the best known are possibly the University of Nanking, and Yenching University (from Peiping). There have naturally been problems of supplies, administration, and personnel due to crowding and other wartime difficulties, but on the whole the universities have worked remarkably well together, offering access to each others' classes, libraries, and laboratory facilities. The vitality of their intellectual life is most stimulating, and full of promise for the future. The pressure on the universities by prospective students has been immense. Where a few hundreds of places were available in an entrance examination, thousands of candidates applied.

The main lines of university education in Szechwan are similar to those abroad: there are courses in arts (particularly for intending teachers), in the pure sciences, and in applied sciences including engineering, aviation, and agriculture; certain universities also teach medicine and dentistry, and theology. One thing that strikes the foreigner is the lack of emphasis on law as a profession; there are few lawyers as yet in China, because the Chinese people are rather reluctant to go to law. On the other hand, the pure and applied sciences are greatly developed in Chinese universities, with an obvious eye to improving wartime and post-war industry and production.

Most science degrees are research degrees, even though the type of the research done is often severely handicapped by wartime limitations; and there is much post-graduate research as well, carried out by the junior or assistant staff under the direction of senior professors. Some of this research work gets out into the field, not only in agricultural but also in social subjects.

University research often links up with the investigations of the agricultural and other research institutes or bureaux, of which there are quite a number. In agriculture, Szechwan has its own Provincial Agricultural Improvement Institute, which was founded before the war but expanded greatly during the early war years; and this institution has sub-stations and sericulture (silkworm production) stations in at least seven localities widely dispersed through the province. The National Agricultural Research Bureau, which has branches in various provinces of Free China, has its headquarters and central laboratories near Chungking; and so do other National research institutions, including the Forestry and Animal Husbandry Bureaux, the Geological Survey (including the Soil Survey of China), and the Academia Sinica. All of these institutions have been carrying out valuable laboratory and field investigations during the war years, in spite of the enormous difficulties, and they have made real contributions to wartime production as well as laying secure foundations for post-war development. (Some of their work is

reviewed by Needham in *Nature* (*loc. cit.*), and also by the writer in an article published in Chungking.[1])

Some agricultural improvement work had been done in Szechwan before the war, notably by Professor Frank Dickinson, of West China Union University, who had for fifteen years or more been introducing improved varieties of crops, fruit trees, poultry, and livestock to Chengtu. The results of his work were visible in many ways during the war: dairy farmers had cross-bred milking cows with a milk production several times greater than that of the local "yellow cow"; there were orchards of apples, lemons, and other fruits that had not been known in the province before—these fruits reached high levels of production, and were shipped to Chungking for the use of Government officials and others there. During the war, when the University of Nanking College of Agriculture, and other universities and research stations, took part in similar work, crop and animal improvement went forward at an accelerated rate in many parts of the province: even artificial insemination was successfully introduced to make better use of the few pedigree animals available; there can be no doubt that this agricultural improvement work was a substantial factor in increasing the food supplies of the province, and so in strengthening China's resistance.

This modern and up-to-date agricultural work, carried out against the rather primitive background of rural Szechwan, often presented curious contrasts. Many agricultural research stations, for example, have walled compounds and guards with fixed bayonets at their gates day and night; complex field experiments might be laid out in fields where it was dangerous to venture late at night because of bandits; research workers have been robbed in daylight when travelling to outlying stations. One university was taking a large part in an "experimental *hsien*" where social and agricultural surveys were carried out, and attempts at improving the lot of the farmers were under way. The experiment was broken up, and one of the university staff was killed, when a riot took place, started it is said by the "Red Lantern Society"—a Boxer group opposed to any kind of modernization. There was also a suggestion that local landlords were disturbed by the results of the accurate land surveys carried out by the university staff. There was found to be more land in the *hsien* than was paying taxes.

Here, as in other matters, the persistence and perseverence of the Chinese character asserted itself. This experimental *hsien* broke down: but another was established in a different locality, and it has already a fine record of survey work and social improvement. Field experiments on crops, located in a region where a mild famine occurred, were pillaged of their grain when ripe by starving country people: but other experiments were carried out elsewhere, and continued to be carried out, giving valuable results.

The Central Government, under Generalissimo Chiang Kai-shek, has prepared elaborate and ambitious plans for the post-war reconstruction of China, which are described in 'China's destiny,'[2] a book that deserves serious perusal

[1] H. L. Richardson, "Wartime research on the earth and its products," in 'Wartime China as seen by Westerners.' Chungking, 1942, pp. 173–88.

[2] Published in Chinese in 1942. A short summary was given in *The West China Missionary News* for January–April 1943.

by all who are interested in world affairs. It is to be hoped that a translation will soon be published. Szechwan, with its productivity, large population, and great natural resources, especially in coal, water power, heavy chemicals, and potential production of fertilizers, will play a large part in this programme, and rapid post-war development may be expected as a result of the education and research work that has been carried out during the years of the war.

Anything that Britain can do now, to train Chinese engineers, agriculturalists, and other technical men so that they can return and take part in post-war reconstruction, will be well worth doing. Advice and assistance will be needed in the development of industrial undertakings under Chinese management, though the field for independent industries under western management may be restricted. It will be found that there is considerable interest by other nations, particularly the U.S.A., in the post-war reconstruction of Szechwan as well as other parts of China, but this need not exclude British experts if they have special technical or scientific knowledge to contribute.

Note on construction of the map

The accompanying map is based on the atlas of 'New maps of the provinces of China,' published by the Shun Pao Press (Shanghai, 4th ed. 1940). In the western Szechwan and Sikang borderlands additions and corrections have been made from Dr. Richardson's surveys, and from the map which accompanies André Guibaut's paper "Exploration in the Upper Tung Basin, Chinese–Tibetan borderland" (*Geogr. Rev.* 34 (1944) 388). The geographical positions in this area are from Cartographic Records No. 1, by S. Y. Tseng. (National Geological Survey of China, Pehpei, Chungking, July 1943.)

DISCUSSION

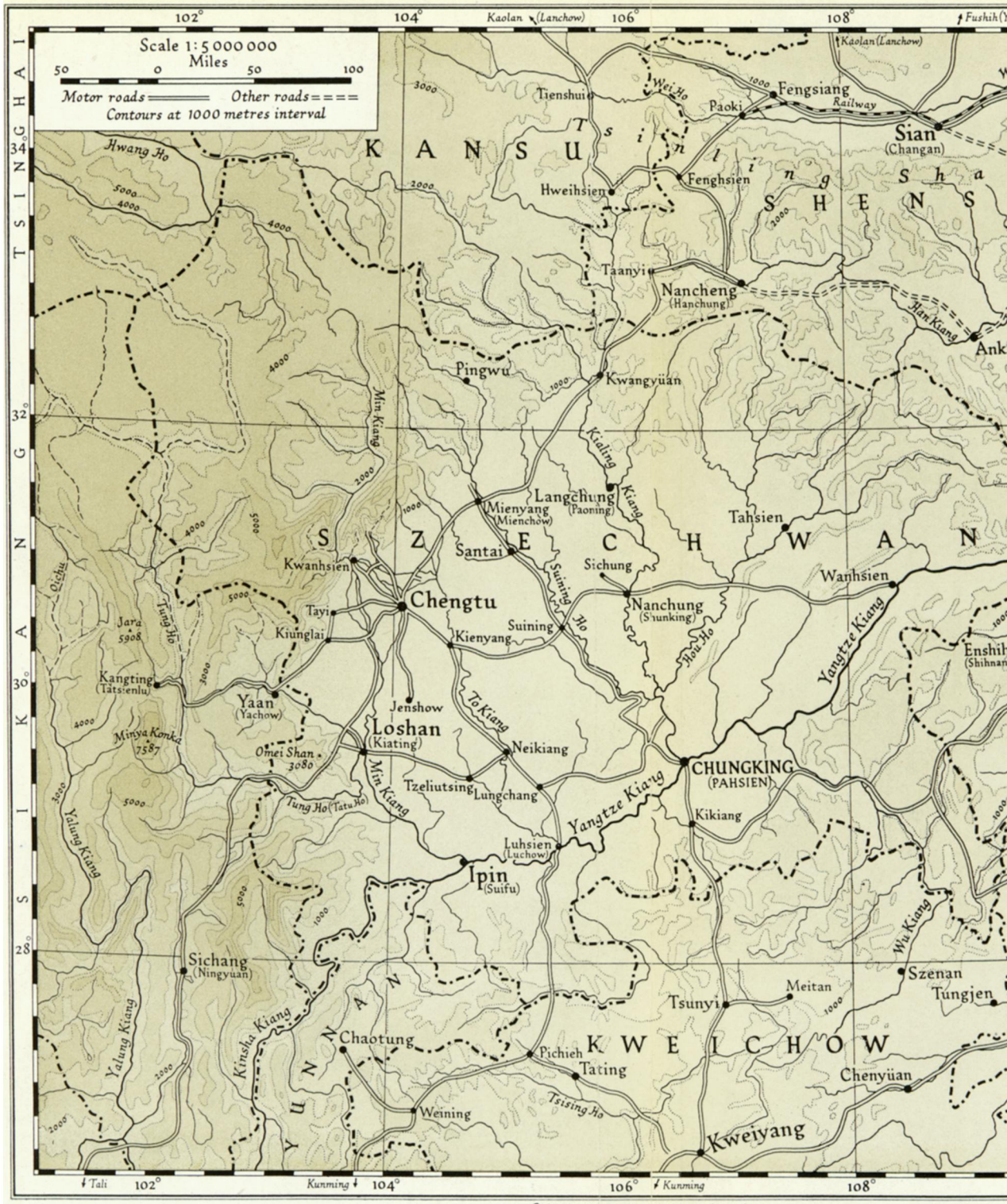
Before the paper the PRESIDENT (The Rt. Hon. Sir GEORGE CLERK) said: Our lecturer this evening, Dr. H. L. Richardson, of the Rothamsted Experimental Station, returned in 1943 from Western China, where he had spent six years as adviser to the Agricultural Research Bureau of the Ministry of Agriculture. His work took him on many journeys through Western China, and into contact with all classes, but naturally his closest associations were with the farmers. To-night he will deal with Szechwan, the province which has played so important a part in the national resistance to the Japanese. He will tell us of the country and its people, agriculture, and industry, and of the changes which war has brought. After his paper we hope to hear from Mrs. Richardson something of family life in Szechwan.

Dr. Richardson then read the paper printed above, and a discussion followed.

The PRESIDENT: I will ask Mrs. Richardson to supplement the very interesting lecture we have just heard from her husband.

Mrs. RICHARDSON: The modern movement has made many changes in Chinese life, and nowhere more than among the women. Forty years ago, Chinese women above the coolie class did not go out into the street except in closed sedan chairs, and the sight of a respectable woman doing a little shopping was so rare that it was apt to collect a crowd, and might start a riot. Elderly missionaries have told me that in their early days in China they were accus-

Map to accompany the paper SZECHWAN DURING THE WAR by H.L.



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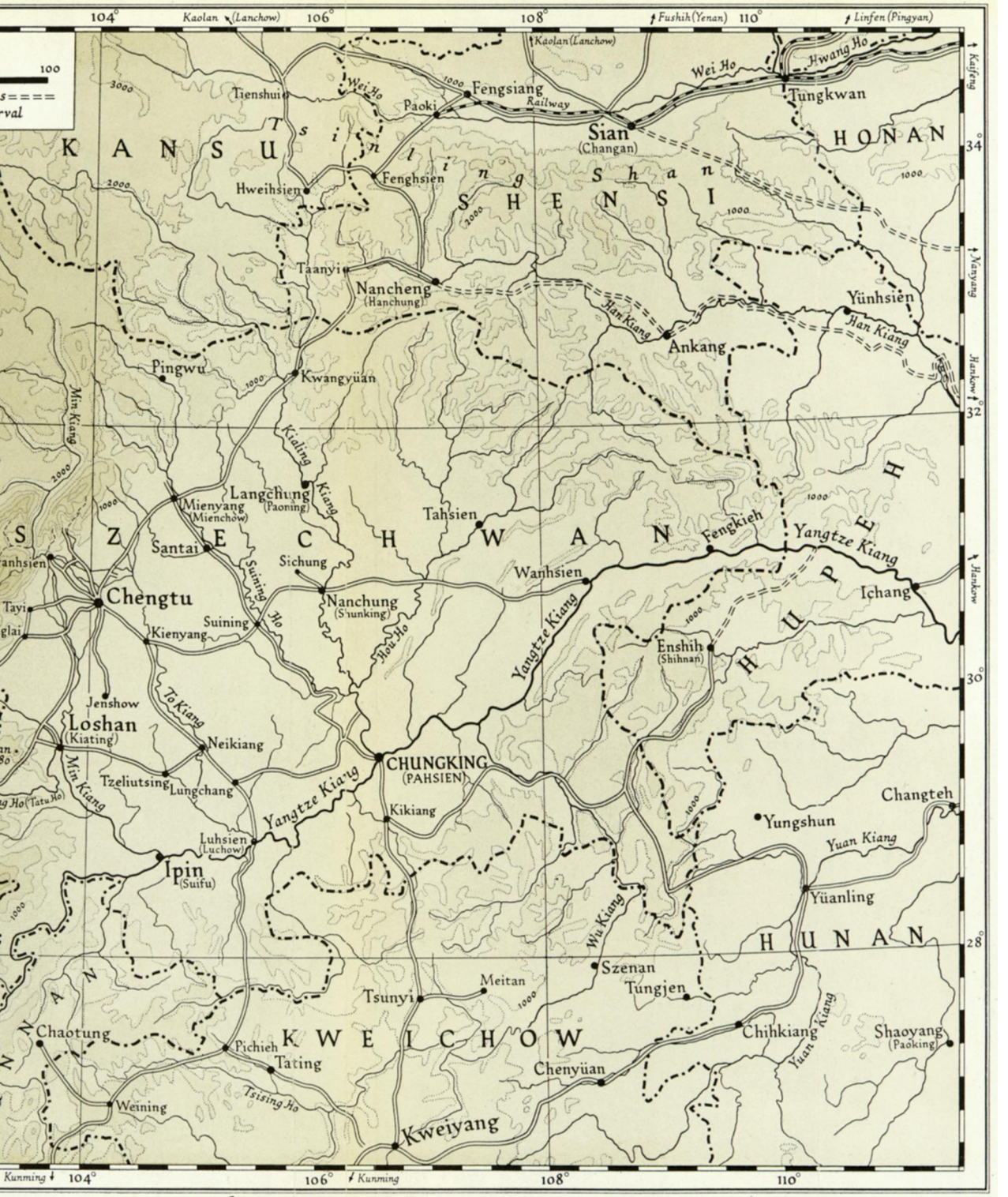

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SZECHWAN
Richardson

tomed to wear men's clothing, with a false queue pinned inside the hat, in order to avoid such unplesant attentions. But now all that is changed. It is a tribute to the character of Chinese women that this great change has taken place so rapidly, and so smoothly.

When I first reached China, I set myself to learn the language, in order that I should not be confined only to the society of women who had had an European education. I soon found the magnitude of the task I had undertaken, but persevered, and at the end of two or three years I could chatter fairly easily about domestic topics, of course in the local dialect. My work was well rewarded, and I was able to make some very pleasant acquaintances in varied social classes, so I learnt something about Chinese family life not only among professional people of modern education but also among farmers and merchants.

Of course, I did not get to know any of the real old, strict, Confucianist families, for their disapproval of practically everything certainly includes Europeans. Many such families undoubtedly still exist, hidden away behind the high grey walls of quiet streets and lanes. They carry on the old life almost as if the new things were non-existent.

But even the most conservative must bow a little to the new things. In Szechwan, many of the changes have only come about since the war. The "new women," refugees from east China, were surprised and shocked when they found that conditions in the west were much like those that their mothers had described to them. The Szechwanese were also apt to be shocked. As one nice old lady said to me: "These modern young women will try to ape the men. Instead of wearing trousers as a decent woman should, and smoking a water pipe, they wear long-skirted gowns like a man, and smoke cigarettes."

But the shock did not last for long. The Szechwanese ladies looked, gasped, and then copied. Instead of the everlasting blue trousers and little black jackets, with hair done into a tight bun behind, they began to wear bright-printed cotton gowns, and the most exotic hair dressings. They heard with envy of the conveniences of life in Nanking and Shanghai, and they began to wish for more modern homes that would be easier to keep clean.

The Chinese like to live in the "joint family" system. When a man marries, he does not leave home, but brings his wife to it. Here they live with the husband's parents, with brothers' wives and families, with uncles and cousins and grandparents and aunts, sometimes to the number of a hundred persons and more. Very large households are only possible among the rich, so that they have become almost a symbol of wealth, much more so than a motor car or an expensive gown.

The old style house is built around courtyards, and is easily added to as the family increases in size. A new wing is thrown out, a new courtyard enclosed, and room is found for several more newly married members. The construction is very simple: windows are of lattice covered with paper; there are seldom any ceilings, and overhead the under sides of the roofing tiles can be seen. The floors are of pounded earth or, in wealthy households, of rough, unscrubbed, boards. Dust and flies are thick, unless many servants are employed, and the chimneyless kitchens are always reeking of smoke and soot. It is not that the people are dirty from choice, but simply that their ancient method of house construction involves the most appalling amount of labour in being otherwise.

Chengtu has a University built in excellent taste, with a charming compromise that includes the curling roofs of Chinese architecture, and the stout brick walls with many windows that come from abroad. With this good example before them, the new houses being built there seem to be avoiding the standardized ugliness of so much of the new housing in the west.

Housekeeping and child-welfare will probably always be the chief interest of the women. But individual women will often have other interests, just as men do. So one meets women in China succeeding at all sorts of unexpected jobs. One woman, whose husband was away at the war, was carrying on his business as a tinsmith. Others are more interested in science. Among my women friends were a professor or two and several research workers, and they were doing good work. Women who are capable of running a big joint-family household, with perhaps a hundred members, and half as many again as servants, must of necessity be good organizers. It is not surprising to find them now, running a factory for a cooperative society, or organizing welfare work, or directing an orphanage.

As in western countries, teaching seems naturally to be a woman's profession; any plans for educating a population of four hundred million must naturally require an enormous number of teachers, and China will have to draw very heavily on her women to staff the ever-increasing number of schools. Indeed it is probably true to say that until enough women are educated to staff them, it will be quite impossible to open enough schools to touch more than the fringe of the problem. The services of every educated Chinese will still be far from enough to carry out the great new plans foreshadowed for the future.

The PRESIDENT: We are fortunate to have with us to-night Dr. George Yeh of the Chinese Ministry of Information; perhaps he would make a few comments.

Dr. GEORGE K. C. YEH: I should like to express my personal appreciation of the very instructive lecture we have just heard and the intimate picture Mrs. Richardson has presented of the people in Szechwan. If I had anything to contribute it would be to support and substantiate everything which Dr. Richardson has said. I have lived for a good many years of my life in Treaty ports such as Shanghai, Tientsin, and Nanking, where the Chinese enjoyed and became accustomed to the ready-made comforts provided by the Europeans. They were in fact enjoying these comforts so much that they almost mistook the coast of China for China itself. It was not until the war had driven all of us into the interior, to Szechwan, Yunnan, and other inland provinces, that we realized that there was another China, a China much more indigenous than the one in which we had been brought up. The war brought about not only a national resistance but also a rediscovery of China by the coastal Chinese themselves.

I think the effect of this will probably be greater than any political changes which may take place after the war in China. Perhaps I should not have said this in my official capacity, but as an academic man I believe that in the long run it is the changes in institutions that really matter to us.

I am very pleased to have been invited by the President to come to this meeting and to have heard such an excellent exposition of the life in Szechwan. Szechwan was once more or less to us—and I am referring here to the small number of sophisticated coastal Chinese who really do not matter as much as the Chinese in the interior who form the backbone of China's resistance—like a colonial part of the Chinese Republic. I remember when I first visited Chengtu and Chungking in 1931 I was struck only by the backward conditions of life in Szechwan. I found that there was a difference of twenty-five to forty years in material conveniences between the coastal cities and the interior, but I did notice then that the province was, indeed, unique in many ways, in its agriculture, in the native intelligence of the people, in its old irrigation systems, and in its retention of many features of Chinese life already lost on the coast. The Szechwan people are known for their craftiness in business and for their assertiveness in public. But they are never small-minded. That perhaps is due

to their local geography. As one of our very early geographers put it, it is the character of the hills and lakes of a province that produce its famous people. The ancient Chinese believed that geography produced the man. A famous story is told of two state councillors who were at loggerheads for many years, and when they both retired they advised each other to go to a province where they would view higher mountains and broader rivers than they had been accustomed to, inferring that they had both been small-minded.

I hope that this society will provide more lectures of the type we have just had the pleasure of hearing, which I am sure can do more to bring the people in this country closer to people of other lands than any propaganda.

Mr. W. V. BLEWETT: I am horrified at the idea of my putting a finishing touch to the excellent lecture we have heard because I am not capable of any such thing. I was in Szechwan during part of the time when Dr. and Mrs. Richardson were there. I met them there and I can certainly corroborate what Dr. Richardson said, though as I did not see much of the Chinese ladies I cannot corroborate what Mrs. Richardson has said. I speak very little Chinese and unless one does speak the language it is difficult to know China; but I saw a good deal of Szechwan and was struck by its great beauty as an agricultural area.

When I went to Chungking in 1942 after some years of absence from China I found it rather grim. I had travelled widely in China before, north, south, east, and west, but not Szechwan, and Chungking seemed decidedly drab. I lived in the two foreign style hotels and there was little difficulty over food. Some things were rare, such as butter and milk, and I remember if I wanted to give a lady a treat I took her to the only dairy in the town and gave her a glass of milk which cost, with mine, fifteen shillings.

I would like to pay my tribute to the Chinese farmer. It has been my job to meet the farmer in many countries, and I met a large number in China, and would like to express my appreciation of the simple, homely, intelligent and friendly attitude of the farmers. The Chinese farmer is very largely China.

The PRESIDENT: We have had a very delightful and instructive evening. I wonder if something that occurred to me occurred to anybody in the audience about the situation of Szechwan faced with the cataclysm of its normal life. Substitute for the mountains round Szechwan the narrow seas and the Atlantic round our country and look upon the rest of China as Europe, and you will see that it is very like the position of this country when it was menaced by the hordes of Hitler, and in the same way the same simple virtues of life based on the tradition of the country have helped them to hold out and to carry on and will help them to carry on through the trials which still await them.

That however is by the way. What I do want to do on your behalf is to thank Dr. and Mrs. Richardson for giving us this very excellent lecture and to thank Dr. Yeh and Mr. Blewett for their interesting comments upon it.