BARON

RICHTHOFEN'S

LETTERS

1870-1872

李希霍芬

中國旅行報告書

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LETTER FROM BARON RICHTHOFEN

ON THE

PROVINCE OF HUNAN.

20th to 26th February, 1870.

In accordance with my programme as communicated to you in my letter from Canton of December 30th, 1869, I have completed my journey through the province of Hunan.

I left Canton on January 1st, went up the North river to Shau-chau-fu, and thence ascended its western branch, the Wu-shui, to I-chang-hien, which is just past the frontier of Hunan. By a two days overland journey I reached Chin-chau, where I embarked on a small affluent of the Lui-ho. I then descended slowly the Lui-ho and Siang-kiang rivers to Siang-tan. It was my intention to proceed from Siang-tan by way of the Tung-ting lake and the Tai-ping canal to Sha-si on the Yang-tze, and thence by land to Siang-yang-fu in Hu-pe. I was disappointed by learning that there was no water as yet in the canal. This circumstance left me no other choice, than to go to Siang-yang either by way of Yo-chau and Sha-si, or by way of Han-kow. I chose the latter route which will take less time to perform. It is a tedious journey through this level country, but unavoidable for reaching Honan and Shan-si, which are intended to be my next field of research.

I hope the complete change of the order in which I first intended to explore various provinces will have created no dissatisfaction. If this should however be the case, I trust that the amount of useful information which I hope I shall have collected, apart from geological observations, in the first four months of this year (the same time which it would have taken me on the previously contemplated southern route to reach Sze-chuen) will justify my present plan. As regards myself, I am extremely satisfied with the change, as it will give me an opportunity of seeing every province in a season well adapted for it. On the southern route, I would now be in the western portion of Kwang-se, with a good chance of being obliged to return to Canton.

My journey has been, on the whole, satisfactory and pleasant. People in Kwang-tung are civil to foreigners, and I have no reason to complain seriously of those of Hunan. It is true that travelling by land in this province requires more care and constant watchfulness than it does in those provinces I had previously visited. There is a good class of people largely represented in Hunan. The bad reception which foreigners have met is due, chiefly, to the existence of a class of rough characters which are met with everywhere in China, but probably in few provinces in equal number with Hunan. Though cowards when met singly, they wield power in exciting a crowd; and it is not difficult for them to succeed, as the inhabitants of Hunan are exceedingly superstitious (Fung-shui, for instance, which are little else but a farce in the north-eastern provinces, exert here their full sway.) Threats of beating and killing the foreign devils are frequently heard. There is a long interval between threats and acts with Chinese, if they fear resistance; but a traveller has to use unremitting care to keep down the excitement of the mob. I hardly have met in any province with a ruder set than the people in the coal-mining places of Hunan; foreign residents would have for a long time a dangerous position among them. On the other hand, the cleanliness, order, and industry of the people generally, and the great number of well educated and well behaved individuals cannot fail to impress a traveller favourably, and this circumstance makes up, in some measure, for any unpleasant experiences he may have previously made.

I am under obligations to the mandarins of this province, who have treated me invariably with civility and afforded me help where I needed it. This is the more to be appreciated as their power appears to be very limited in this province, and the people in many places seem to govern their mandarins. All the way down from Siang-tan, without the least solicitation on my part. I have been accompanied, for the sake of safety, by an Imperial gunboat. The reasons were, the supposed danger from robbers consequent on the poverty caused by the floods of last year in these lower regions, and the known animosity of the mob against foreigners. The rude treatment the officers of your expedition experienced at Yo-chau is still kept fresh in memory. It would probably be difficult to find in the Chinese army more amiable officers than those who were appointed at every gunboat station to accompany me. Far from restraining my steps, they even encouraged visits to the large cities, and procured me the great comfort of keeping my boat always clear of curious spectators.

In obedience to my instructions, I beg to lay now before you some preliminary notes regarding the country through which I passed.

THE NORTH RIVER.—The Canton North river (including its branch, the Wu-shui) does not show the province of Kwang-tung to advantage. It crosses in succession, three mountain ranges of from 2,000 to 3,500 feet elevation, which trend W.S.W., to E.N.E. The first is north of Tsing-yuen-hien, the third north of Lo-chang-hien. The river breaks through them in steep gorges with precipitous walls. They are separated by equally directed tracts of low hills and limestone cliffs, which enclose some fertile plains of small extent. Shau-chau-fu is situated between the second and third ranges. The existence of *coal-mines* in that region has been known for a long time. Little attention has been paid to them, on account of the inferior quality of coal brought for sale to Canton. But, as work appears to be confined to those places where the coal-beds were found cropping out on the hill sides, and is more superficial than in most other coal-mining districts that have come under my observation in China, and in view of the absence of any known coal-field of value in the neighbourhood of Canton, I think that that of Shau-chau-fu is well worthy a detailed examination. There are several workable coal-beds, their position is but little disturbed, and the quality of some of the coal is by no means bad. It is not improbable that the establishment of deep mining would be a means of supplying Canton and Hongkong with a tolerably fair fuel at a cheap price.

The city of *Shau-chau-fu* is situated at the place of confluence of two rivers, one of which descends from the Meiling-pass and Nan-hiung-chau, and carries the traffic to and from Kiangsi, while the other (to Wu-shui) has its sources in Hunan, and forms part of the ancient highroad for the trade of Hunan and a great portion of western and central China with Canton. Yet, Shau-chau-fu is an unimportant place as regards commerce, and nothing but a convenient customs station.

With the *Tung-lo-ling* the range north of Lo-chang, and still lying in the province of Kwang-tung, the last continuous mountain range is crossed between Canton and the Tung-ting lake. The headwaters of the Wu-shui, as well as those of some affluents of the Siang-kiang, are situated in a hilly region north of it. The pass between both, here known as *Chĕ-ling* (called the little or lesser Meiling in some European books,) has an altitude of probably less than one thousand feet above level of the sea. The great highroad which crosses it in a length of thirty miles, is slightly undulating.

The fact that the prominent range of the Tung-ho-ling (a portion of the Nan-ling ranges) does not form the watershed between Kwang-tung and Hunan, but is intersected by a navigable river having its sources north of it, is an important circumstance in the history of Chinese commerce, as it gave origin to one of the chief routes of commerce in the Empire. Hopes have been entertained, that this same route would be practicable for a future railroad to connect Canton with the coal-fields of Hunan. But the prospects for such an enterprise are dim. The precipitous gorges in which the north river breaks through the three ranges are a formidable obstacle, and unless another and better route is found, which is far from probable, the prospective profits of an easy connection with Hunan must be enormous, in

order to justify the great expense of laying a railroad track along the north river and the Wu-shui.*

The traffic over the Che-ling pass, though said to be a fraction of what it was before the establishing of steamers on the Yang-tse, is still surprisingly large. There is a crowding of pack animals and coolies going either way.

It is a well-known fact, that about 120 miles west of the Che-ling pass, Hunan is connected with Kwang-si by a continuous water communication kept up practically by means of gates. The existence of a low bridge is said to be the only obstacle preventing boats which stand high out of the water from passing from one province to the other; but small boats can proceed from the Tung-ting lake to Canton. Yet it seems, that that apparently convenient passage is not used to any notable extent, and not at all for the transportation of goods to Canton. The probable reason is, either local squeezes, or the dangers of navigation of the Kweilin river. The cost of the transportation alone, of goods from Hunan to Canton, must certainly be greater viâ the Che-ling pass than viâ Kweilin.

PROVINCE OF HUNAN.—I passed no important place in Hunan, until I reached Siang-tan; and as, in addition to my own observations, I attempted to gather general information in regard to the province, on my journey as well as in that great commercial emporium, I leave my itinerary with the Che-ling pass and will try to condense more systematically some notes regarding Hunan, selecting such as may be of general interest.

You will receive, together with this letter, a map of the province of Hunan, which I drew from the Chinese original, reducing it to a convenient scale (1 inch = 15 geographical miles,) and marking on it various items of information. I did not make any corrections on the Chinese original, though the route-maps, which I am marking as I go along would have given me an opportunity of doing so. If the Committee consider the map sufficiently interesting, I would respectfully request to have a copy of it taken, and to return me the original; as, together with such additions as I may be able to make hereafter, and with the maps I have made of other provinces, it may serve hereafter as a basis for publication. I think that a series of maps of the provinces of China, somewhat in the style of the one I send you, would be useful to the Chamber, because the information noted down on them in a conspicuous form may be from time to time enlarged by competent travellers.†

I begin with some geographical notes:—

Area of Hunan.—The area of the province of Hunan is, according to the Chinese map, 62,000 geographical, or nearly 84,000 statute square miles. Lobscheid gives 70,000

Rivers.—The basin of Hunan, the boundaries of which nearly coincide with those of the province, is drained by four rivers, which empty into Tung ting lake. They are, from east to west:

1st.—*The Siang River*, navigable high up in its course by boats loading 450 piculs, while all its numerous and extensive ramifications are accessible, partly to the same craft, and partly to smaller boats for considerable distances. Through these

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* I have read subsequently after my arrival at Hankow, the report of Dr. Dickson on his journey over the same route which I have taken (Journal North. China Bra. Rl. As. Soc. 1864), and I see that he speaks in emphatic terms of the facilities of building a railroad from Canton to Hunan. The difficulty of the Tsing-yuen gorge which he mentions does not exist, as it can be easily evaded by taking a more direct route than the river. But the difficulty of crossing the Lo-chang range or Tung-lo-ling is certainly much underrated by Dr. Dickson.

† You will find the spelling of the names on the map generally in accordance with that used in Lobscheid's "Topography of China." I have, however, substituted *t'sh* for the English *ch*. Geographical names on maps should be spelled so as to be easily read by every one. *T'sh* can only be read in one way, while the pronunciation of *ch* is different in nearly every language. In my letters I adhere of course to the *ch*, to which English readers are accustomed. I make no apologies on behalf of the rude technical execution of the map. You are aware that a Chinese boat does not offer much convenience for that sort of work.

affluents and by low mountain passes situated in the regions of their respective headwaters, it offers easy communication with Kiang-si to the east, Kwang-tung and Kwang si to the south, and the basin of the Tsz' river to the west. The area of its basin is 28,800 geographical or 39,000 statute square miles.

2nd.—*The Tsz' River*, navigable only by the smallest kind of boats, which must be pulled up frightful rapids. The term "T'an-ho" (stream of rapids) is especially applied to it as a name. Its basin covers an area of 7,500 geographical, or about 10,000 statute square miles, and offers easy connections by land, with that of the Siang-kiang to the east and south, upon which it is mainly dependent for supplies and the sale of its own productions; while more difficult, because longer, land routes connect it with the basin of the Yuen-kiang to the west.

3rd.—*The Yuen River*, a large river with extensive ramifications, some of which have their headwaters in Kweichau. Its navigation is throughout difficult and dangerous. Rapids commence 120 *li* above Chang-te-fu, and continue all along the course of the river and its affluents. Boats leaving Chang-te-fu do not carry more than sixty piculs. At the mart of Hong-kia, little more than midway between Chang-te-fu and Yuen-chau-fu, and about 600 *li* distant from the former place, goods are put on smaller boats, drawing no more than sixteen inches, and loading thirty piculs. These ascend the main river to Wang-ping-chau, situated near its source in Kwei-chau. All the larger affluents are navigated, but most of them by boats loading only ten piculs. Freight is consequently expensive, a cargo of 60 piculs costing 40,000 cash from Chang-te-fu to Yuen-chan-fu, a distance of 1,000 *li*, or more than Tls. 6 for a distance of less than 300 miles. The road overland is much shorter, but the expense of freight by it is double. On the Siang river, freight is about one-seventh of what it costs on the Yuen river. The basin of the Yuen river has an area of 26,100 geographical or 34,300 statute square miles, of which 16,650 geographical (22,500 statute) are situated in Hunan (including a small corner of Sze-chuen), and 9,450 geographical (12,500 statute) in Kwei-chau; this latter portion is partly inhabited by independent Miao-tse: From this basis there are inconvenient passages by land to the Tsz'kiang basin to the east, and the centre of Kwei-chau to the west, while to the northwest it is connected by the important, but inconvenient and expensive Yu-yang route with the province of Sze-chuen.

4th.—*The Ling-kiang*, navigable only in its lowest portion. Its area is 6,000 geographical or 8,000 statute square miles, and derives importance chiefly through the position on its head waters of the tea-district of Ho-fung-chau. But this belongs to the province of Hu-pe, and its produce is, as I see from your own report on the Upper Yang-tse, carried across the hills to I-tu-hien on the Yang-tse, not benefitting the trade of Hunan.

Relative Position of Chief Places of Commerce.

It will now be seen at a glance, what makes *Siang-tan* such an important centre of trade, notwithstanding its situation a good distance up one of the four rivers of the province. With reference to the Tung-ting lake and the Yang-tse, it offers only this slight advantage over Chang-te-fu, that in winter it can be reached from Yo-chau by somewhat larger vessels than Chang-te. But the chief advantage of its situation is, that it commands the basin of the Siang river, the easiest of approach, the largest, and by far the most important of the four basins of the province; besides, the passages to Kiang-si, and those to the neighbouring populous basin of the Tsz' river.

Siang-tan is from these reasons one of the chief commercial places in China. The number of its inhabitants is said to be one million. The city extends about three miles along the left bank of the Siang-kiang, and is lined on the river side with a forest of masts. Its depth from the river is said to be five *li*. It consists almost altogether of suburbs, which are the seat of the trade; the city walls enclose the yamêns, but no great commerce is done within them. It it a much larger city than *Chang-sha-fu*, and more populous, though the provincial capital boasts of a

larger space enclosed within its walls. Third in order among the cities of Hunan is *Chang-te-fu*. Although a considerable trading place, it is said to be far inferior to Siang-tan, as regard size, population, and commercial importance. Besides some districts on the Ling-kiang, it commands the trade of the Yuen-kiang, which rivals the Siang-kiang, as regards extent of ramifications and area of basin; but the importance of this river is by no means proportionate to the size of its basin, and it commands no passages to any largely consuming or producing regions, excepting that to Szechuen. Regarding this, however, the route from Fu-chau (Szechuen) to Chang-te-fu (Hunan) is only a portion of the transit route of nearly all goods passing over it; most of them must reach Siang-tan before they can be distributed to their places of final destination. Besides these various causes of the superior importance of Siang-tan, the list of products which I subjoin will show that nearly all valuable articles of export of Hunan are derived from the eastern half of the province.

I may mention in connection with this subject, that I was told the chief business of Siang-tan was that of banking. And if the position of Siang-tan is considered as connecting the commercial intercourse between the larger portion of western central China with the southern provinces, it is indeed evident that there is no place equally favourably situated for controlling financial matters also between distant portions of the empire. The business is here, too, chiefly in the hands of Shansi men, besides some from Shantung and Chili.

Formation of Surface.

Hunan is eminently a country of hills. It contains apparently some groups of mountains of a few thousand feet elevation, and trending in well defined directions, but it seems that they assume in no instance the form of continuous high mountain-ranges, in relation to the present general level of the country. The area of alluvial soil, too, is very limited. The only plain of any extent is around the Tung-ting lake, but even this extends little beyond the area covered by water in summer.

The surface of that portion of Hunan through which I travelled is composed from the southern boundary of the province to north of Hang-chau-fu, pre-eminently of soft red sand stone more recent in age than the coal-formation. It gives origin to exquisitely picturesque scenery, when cut up to the depth of a few hundred feet by a net of water-courses, which are so many narrow gorges bounded by vertical or over-hanging walls. The contrast of a luxuriant vegetation with the brick-red colour of the rocks contributes to create an endless variety of beautiful sights These regions are, however as a rule, thinly inhabited and little productive. The same formation constitutes, around Lai-yang and Hang-chau-fu, a low, rolling country, with patches of alluvial soil between numberless slight elevations. These attain, in places, an extent of a few square-miles, and are fertile, yielding rice and various kinds of grain, besides hemp and tobacco. The summits of mountain-ranges, that existed at the time of the deposition of these red sand stones, protrude from between the hills composed the more modern rocks. Besides some older rocks, the mountain-ranges are chiefly composed of the coal formations which besides constitute extensive hilly regions. These hills are well wooded, and covered with large plantations of the tea-oil shrub and tea. They leave little room for agriculture, but the fertile soil yielded by the rocks of the coal-measures renders the narrow bottoms of the valleys especially adapted for the cultivation of rice.

It appears, that the character of surface-formation which I have here described prevails over the greater portion of southern and western Hunan, though more ancient formations take probably the place of the coal-measures more and more as one approaches the south western corner of the province.

North of Hang-chau-fu, the country continues hilly, but detached groups of higher mountains are more frequent than south of that city. Among them is the celebrated *Hang-shan*, one of the five sacred mountains of China, and known as the place of the original tablet of Yu. Its elevation is about 3,000 feet. It appears to

form part of an ancient mountain-range, stretching from west-south-west to east-north-east, whose summits only are visible at present, but which was formerly of some importance, as it formed the northern rim of the basin in which the coal-measures before described and the overlying red sand stones were deposited. A series of cold bearing strata, differing in age and character from those first mentioned, take part in its structure, and by their hardness give origin to dangerous cliffs and rapids in the Siang river. The same formations of which these mountains are composed, continue to prevail from here all the way to the Yang-tse. Granite is one of them, but occurs only in a few places. It is hewn, at *Kin-tse-wan*, below Chang-sha, into slabs and rice-mortars which are largely exported to the lower countries. Sand stones and conglomerates are the predominating rocks. They form barren hills; while softer sand stone bears Tea-plantations, and strata of argillite have afforded means by the decomposition of the rock, for the establishment of large potteries those of *Tung-kwan-yin*, 19 miles below Chang-sha-fu, being the most celebrated. A great number of glazed tiles, of all colours, and of the most fantastic patterns, for adorning temples and private buildings, are made here.

The soil between these hills is, as a rule, sandy and not fertile. Lime, for the purpose of manuring it, is burnt in great quantity at various places along the river. The occurrence of limestone is quite subordinate, though its out-croppings along the river are numerous.

The only portions of Hunan which are probably more mountainous than those here described are the far northwest and southwest.

Products of Hunan.

Hunan exports chiefly raw produce. Manufactures of any kind are in a low stage, and the province has to import nearly all the manufactured goods it requires. But, as the country is hilly, and the Chinese make little use of sloping ground, excepting where they can either terrace in and cultivate rice, or where they plant the tea-shrub or tea-oil shrub, the quantity of raw vegetable produce exported is comparatively small, and that of animal production is nil.

It is noteworthy that, notwithstanding an exceedingly favourable climate, Hunan produces no *silk*, very little *sugar* and no *opium*, excepting a very small quantity grown near the frontier of Kwei-chau. It lacks therefore some of the chief sources of wealth which neighbouring provinces, though to all appearance no more advantageously situated, possess. It is difficult to understand the causes of this deficiency. It may be that the climate is unfavourable for the cultivation of the poppy, and the level ground may be too limited in extent to admit of planting much beyond what is needed for the daily food of the people. Chinese like to be safe in regard to this and will generally prefer to supply first their rice and other grain, before they seek to plant those crops which are not for their direct use, but by the sale of which they may acquire the funds for purchasing their food.

Tea has to make up for these deficiencies. It ranks first in value among the articles of export. That which is sent to Hankow is made east and west of Siang-tan, in *Li-lin-hien*, *Liu-yang-hien*, and *Ping-kiang-hien* to the east, *Siang-hiang-hien*, *Sin-hwa-hien*, and *Nang-hwa-hien* to the west. Ping-kiang produces most, and Ngan-hwa the best quality of Tea. The prepared leaf is brought in cotton bags containing from 70 to 100 catties to Siang-tan, where it is classified, put in boxes and made up into chops by the large dealers. Another tea-district is *Ki-yang-hien* in Hang-chau-fu. The tea from this place is exported both to Hankow and Canton, while that grown in a third district, the region adjoining the province of Kwang-tung goes all to Canton. Western Hunan produces no tea.

Hemp is among the chief articles of export of Hunan. The market for it is Fu-shan-hien near Canton. It is even carried as far as Fo-kien. The price of Tsing-ma is Tls. 5 to 6, that of Pe-ma Tls. 6 to 7 per picul. The best (Lao pe-ma) is grown in the district of Ping-kiang, and is said to be sold as high as Tls. 10 per picul.

Cotton.—An amount not sufficient for home consumption is grown in Hunan. Hu-pe supplies largely above the quantity required to make up the balance. In consequence, a good deal of cotton grown near Chang-te-fu is exported to Sze-chuen, and some Hu-pe cotton is re-exported to the same province. The price has varied from Tls. 15 to Tls. 30, and is now Tls. 16 to 19.

Rice is grown throughout the province in sufficient quantity for home consumption, and a great deal is exported to Hankau and the lower Yang-tse from the regions adjoining the Tung-ting lake. It is, besides medicine, the only article of export from the upper portion of the Yuen-kiang basin, though only in good years. Its present price on the Tung-ting lake is a little over 2,000 cash per picul, which is about double the usual standard, and more is exported this year. Its present price at Siang-tan is 2,700 cash per picul.

Paper is the only manufactured article exported from Hunan Most of it goes by way of the Han river (Fan-ching) to Honan and Shansi. Only the inferior kinds of yellow joss-paper, made of bamboo and rice-straw, are produced in Hunan. The profits to the province at large are probably small, as all writing paper is imported, chiefly from Fokien.

Tobacco is grown in Hunan, but it is of inferior flavour. It sells at Tls. 1.2.5 to Tls. 10 per picul and is exported both to Kwantung and Hankau. Better qualities are imported, chiefly from Fokien; the best from that province sells as high as 640 cash per catty.

Tea-oil is one of the staples of Hunan, and is manufactured in great quantity throughout the province, chiefly in the south. Its price at Siang-tan is Tls. 7.5.0 per picul. Most of it is exported to Canton. Groundnut oil (Hwa-sin-yu), though likewise produced in large quantity, is not an article of export. Tung oil is imported from Sze-chuen, though a small quantity of it is made in south-eastern Hunan.

Coal.—This is the most important of the mineral products of Hunan. The whole of south-eastern Hunan may not unjustly be called one great coal-field, although the coal formation is far from forming the surface-rocks uninterruptedly. It is, without exception, the greatest coal-field that has hitherto come under my observation in China. It extends, according to the information I gathered in addition to my own observations, from the northern slope of the Nan-ling to near Siang-tan, that is, through upwards of two degrees ofilatitude and about the same of longitude. The total area comprises about 16,200 geographical or 21,700 statute square miles. But, unfortunately, a great portion of this area, probably more than one half of it, is covered by those sediments of many thousand feet in thickness mentioned before as being more recent in age than the coal formation, while a small proportion of it only is occupied by the more ancient rocks. Yet, the coal measures themselves are visible in extensive regions. The stratification is ordinarily much disturbed, a fact which has in many localities influenced disadvantageously the position and quality of the coal-beds.

From a geological as well as from a practical point of view the coal-field must be divided into two nearly equal portions, which may be called the Lui river coal-field and the Siang river coal-field. The former yields anthracite, the latter bituminous coal. The coal measures are different in character and in age in the two regions.

1st—*The Lui River Coal-field.*—The southernmost mines of this coal-field are already met with on the headwaters of the Canton north river, near *I-chang-hien* and *Lin-wu-hien*. Next to the north follows a broad belt of mining districts, marked by the following places: *Chin-chau*, *Kwei-yang-chau*, *Kwei-yang-hien*, *Kwei-tung-hien* and *Hing-ning-hien*. A great deal of coal is mined here for local use, but scarcely any of it is exported, partly because some of those remote regions are not accessible by water, and partly because the coal is of an inferior quality. If once seen it can be immediately recognized, as it is alike in all these southern places, and unlike any other coal coming from the west of Hunan. Though all anthracite, it is exceedingly soft and friable; large pieces crumble into mere dust by a slight blow with the hammer. If left to itself, it parts into small shelly pieces caused by the

existence of rounded planes of attrition, which exhibit a remarkably bright lustre, resembling that of plumbago. These unfavourable properties of the coal are undoubtedly due to the crushing action to which it was exposed during the slow process of the folding of the strata in which it is enclosed. The disturbances are so great that there is little prospect of ever finding here a good kind of coal.

The most important region is situated on both sides of the Lui river (Lui-ho), between *Yung-hing-hien* and a few miles north of *Lui-yang-hien*. The coal formation rests here on the flanks of a north and south range made up of more ancient formations, its strata dipping, with great regularity, about 45 degrees off from that range, on either side of it. The coal beds are intercalated, in groups, and at various levels, between a series of sand stones and argillites which have an aggregate thickness of at least five thousand feet. The inclined position of the strata is favourable for disclosing the various coal-beds to view, and makes mining tolerably easy. The situation is no less advantageous; many mines are worked close to the river-side and at little distances from it. All the coal in this district is anthracite. In those mines situated farthest up the river, near Yung-hing-hien, it still resembles in character that described from the Chin-chau and other districts. Proceeding north, the coal gradually improves in quality. At the chief selling places: Lui-pa-kou, Tan-chau, Whang-i-kang, Tsing-sui-pu and Sz-mi-chau situated respectively 7, 12, 15, 17, 28, geogr. miles, by water, below Yung-hing; distance from Yung-hing to Lui-yang 38 geogr. miles by water, 25 miles direct, some good anthracite may be seen. But the best is raised from some new mines a few miles east and north-east of Lui-yang, just before the whole formation disappears under the overlying red sand stone. This last portion of the coal-field would well repay the trouble of a detailed examination, which I was prevented from making at the time by misrepresentations connected with the then approaching Chinese New-Year. The character of the coal formation is the same as farther south; the coal is better, yet the mines are smaller, probably because the difficulties in the way of Chinese mining are greater

The "Coal of Lui-yang," by which name the anthracite of the entire region described is known in the lower country, is mostly of great purity, black colour, and concoidal fracture. But it lacks solidity, and the proportion of lump coal to small is no more than one-fifth to one-tenth at most mines. The superiority of the northernmost mines of the district is chiefly due to the circumstance that most of the coal is raised from the mines in fine solid lumps. I think it will compare favourably with the best kinds of anthracite known.

The original price of Lui-yang coal is from 30 to 100 cash per picul (Tl. 0.8 to Tl. 1 per ton) for small, and 140 to 160 cash (Tls. 1.4 to Tls. 1.6 per ton) for lump, put on board boat. The distance from Yung-hing to Siang-tan, by water, is 196 miles (1,000 Hunan *li*) and from here to Hankau 237 miles. Freight is remarkably cheap. It is for a cargo of upwards of 400 piculs, from the mines to Siang-tan. 30.000 cash, and from there to Hankau 36,000, making a total of 66,000 cash for say 400 piculs, or 165 per picul, or Tls. 1.6.5 per ton of 16 piculs, for a distance of 433 geographical miles. Taking the original price of lumps 150 cash per picul, the best Lui-yang anthracite can therefore be laid down at Hankau for a trifle over Tls. 3.1.5. No transit dues have to be paid, excepting 16 cash per picul near Yo-chau. It is, of course, desirable that this price should be reduced to its lowest possible figure, and coal be procured of the best possible quality. Any prospect of a reduction of freight is entirely out of the question. No steamer and no railroad would carry coal for so low an amount as the boatmen of Hunan do, and in China there are few instances of so low a rate of freight. It is at the mines that an improvement must be looked for. They are at present imperfectly worked. The abundance of coal croppings and the ease of following a coal-bed down by an inclined shaft cause a great many mines to be opened in succession, and little trouble to be taken to continue work to great depth. Nowhere did I find it so difficult to ascertain the depth of the mines, one or two *li* being the figure usually given. I descended into some shafts, but no more than 60 or 80 feet, as it proved to be very unsafe to go to the bottom. It appears that few mines are worked to a greater depth than 180 to 200 feet on the

incline. It may be confidently expected, that deep mining would secure an improvement of the coal in that direction where it is most needed, namely as regards increase of solidity. The country is admirably adapted for draining the mines by tunnels to the depth of several hundred feet. The construction of such adits in the soft rocl of the country, and with cheap labour, would be inexpensive. The chief conditions required for extensive and cheap mining are therefore present, and the time will probably come when the best anthracite will be sold at Lui-yang for a cheaper price than is paid at present for the lowest kind of dust coal which is mixed with clay to render it fit for use. I forgot to mention the thickness of the coal-beds, which is moderate, varying from 3 to 6 feet. But this want is made up by the number of coal-beds that can be worked in most places by one single set of mining works.

The amount of Lui-yang extracted coal is already large. It is used in all the places down the Siang river. Most of it is carried to Hankau, where some, considered a trifling amount by the Siang-tan coal dealers, is sold to the foreign steamers. Some is carried as far as Kiukiang and Nanking. Great complaint is made of the heavy dues to which it is subjected at Kiukiang, Wuhu, and Nanking (100 cash per basket of 140 catties at each place). To get at an estimate of the present amount of Lui-yang coal extracted, I counted approximately the number of cargo-boats I met on the Lui-ho, from Yung-hing to the place of its confluence with the Siang-kiang, a distance of 96 miles. I counted upwards of two thousand boats averaging in capacity of 200 piculs of coal (the basket of coal, weighing from 140 to 160 catties, appears to be the standard measure of these cargo-boats). Going up the river, they carry merchandise for the upper country, and the bulky medicines destined for Kwangtung. Returning, they take, first, the imports from Kwangtung, which are not only less in value than the exports, but mostly very weighty, and require only a small proportion of the available boats. About two-thirds of them take therefore on their return trip a cargo of coal. Considering twenty days as the time required for the 2,000 boats to be replaced by an equal number of others, then at least 600,000 piculs of coaling capacity will represent the total of vessels entering and leaving the Lui-ho at its mouth every month, and 200,000 piculs will be at least the amount of coal leaving the river every month, or about 150,000 tons a year. This figure is, however, probably too low. From the few details which I have mentioned a great future may be confidently predicted for the Lui river coal field, provided a market can be found for its abundance of excellent anthracite. The establishment of deep mining, the abolition of transit and other dues on coal, and the provision for cheap freight on the Yang-tse, may co-operate to allow the coal to find its way to Shanghai as a permanent article of import. No other mines of good anthracite are known that are connected with Shanghai by a continuous water communication, and it is therefore not probable that the better kinds of Lui-yang anthracite would meet with a dangerous competition from any other anthracite.

2nd.—*The Siang River Coal-field.*—The lower course of the Lui river is enclosed between rolling hills of red sand-stone. A few miles north of its confluence with the Siang river, the coal-measures re-appear. But they are quite different in character from the formation in the Lui-yang coal-field and probably precede them in age. They bear altogether *bituminous coal. Cha-lin-chau, Lilin-hien, Siang-hiang-hien* (all of *Chang-sha-fu*), *Pau-king-fu* and *Ki-yang-hien* in Hang-chau-fu are the best known districts. I saw abandoned coal-mines at several places along the Siang river, but did not visit those other localities. The existence of coal-mines in Ki-yang-hien came to my knowledge a long time after I had passed Hang-chau-fu; besides the journey from there to the mines and back would have required a fortnight's time, which would probably have been ill spent. Li-lin-hien and Cha-ling-chau are of no importance, as they yield only a small quantity of an inferior dust coal. I intended visiting Siang-hiang, but as this trip must be made in winter in very small boats, and the season commenced to be exceedingly rough and cold, I gave it up; moreover the inferior quality of the Siang-hiang coal which I saw at Siang-tan was not in the least encouraging for a visit under unfavourable circumstances. Very little lump is produced, nearly all dust. Most of it is made into an

inferior kind of coke, which supplies some iron foundries on the Yang-tse. Ki-yang-hien furnishes a slightly better coal, a very small proportion of which is in lumps. That which is mined in Pau-king-fu is very impure, full of sulphuret of iron and clayey matter. It is, besides, nearly out of reach, as the Tsz' river is said to be all but unfit for navigation.

I collected samples of coal from all these localities. They justify the very low opinion which the coal-merchants of Siang-tan have of all Hunan coal other than that coming from the Lui river. Only the circumstance, that bituminous coal is applicable to purposes for which anthracite cannot be used, secures a market for some of it. It is, for instance, largely used on the Siangkiang for burning lime, and supplies the blacksmiths far down on the Yang-tse. Judging from the character of the enclosing strata at those mines which I visited, the Siang river coal-measures belong to the same formation in which a coal-bed of inferior quality is mined a few miles off the right bank of the Yang-tse, near a place called Whang-shi-kang, 60 miles below Hankau.

3rd.—*Other Coal-fields.*—The only other coal-field in Hunan of which I got information comprises portions of *Shin-chau-fu* and *Yuen-chau-fu*, in the western half of the province. The mines are said to be worked on a small scale, and to furnish only small coal. That from Yuen-chau-fu is used only on the Yuen river, while a small quantity of Shin-chau-fu coal is exported. I failed to get a sample of it. I did not mark these coal-fields on the map. because their exact situation is not known to me.

It is a matter of course, that none but the best coal from so remote a province as Hunan can find a market deserving the attention of foreigners, until the time when foreign enterprise in the interior of China shall be far advanced, and a large local consumption of coal be secured for industrial purposes. The better kinds of the Lui-yang anthracite answer this condition. But to judge from the imperfect knowledge I gathered, the same cannot be said of the bituminous coal of Hunan. All that I have seen (perhaps with the exception of some from Ki-yang) is inferior in quality to that of Lo-ping-hien on the Poyang lake, and incomparably worse situated. The original price and the cost of transportation of the bituminous coal from various places in Hunan are, on an average, a little less than of anthracite, but the difference is not so great as to make up for their inferior qualities. An amelioration may be expected by the establishment of deeper mining; but where the Chinese do not extract any better coal than that which they bring now to market to Siang-tan it would be vain to speculate on so great an improvement as would be required for bituminous coal to compete with that coming from other places, at so distant a market as Shanghai.

If steam navigation on the Yang-tse should be soon extended as far as I-chang, then the bituminous coal of Hunan will, of course, furnish a convenient and cheap fuel to those steamers whose boilers are not adapted for the use of anthracite. But this would be too limited a market to influence the working of the coal mines to any great extent.

Iron.—It appears that iron ore is of sparse distribution in Hunan, considering that the coal formation with which it is usually associated covers so large an area. Though argillaceous iron ore occurs more or less at nearly every coal mine, it is mostly not abundant enough to form an object of mining. One region only has come under my observation where there are superior and abundant deposits of iron ore. It is the country around *Chin-chau*. Great thickness of the strata of the coal formation are there impregnated with iron and manganese, and some fine deposits of excellent limonite (brown iron ore, here probably manganiferous) are exposed. The place offers a great opening for mining. Though situated near the southern boundary of the province, Chin-chau is adjacent to a navigable affluent of the Lui-ho, and the ore can be carried down stream at the same low rate of freight as the coal. The Chinese smelt the ore at a place between Yung-hing-hien and Lui-yang-hien, and make from it a tolerably good wrought iron which is sold, according to quality at 2,000 and 2,400 cash per picul. This is the only instance where I have seen Chinese smelt other than magnetic iron ore.

Another deposit of iron ore mined by the Chinese is reported to be in *Pau-king-fu*, probably too, in connection with the coal formation. This ore is exported to places on the Yang-tse, where it is smelted with coke from Siang-hiang. It is to be expected that a more detailed exploration of the coal districts of Hunan will disclose the existence of other deposits of iron ore. But it is questionable whether the commercial value of the iron made from it will extend far beyond the supply of the local consumption, as there are other deposits of iron ore known in the vicinity of some of the seaports.

Other Metals.—There is only one place in the whole province of Hunan reputed for its wealth in metals generally. It is Pe-sha-sze in Sing-ning-hien, Pau-king-fu. Besides *copper*, which takes the first place, *silver*, *quicksilver*, *tin*, *lead*, *iron*, and *gold* are said to be produced there. The place is well-known to all Hunan men. Copper and tin from Pe-sha-sze are sold and used for manufacturing purposes at Siang-tan; gold is only washed in the sand of a river. I could not learn of any other place producing any of those metals, excepting iron. Quicksilver is reported to be produced in one or two other localities, but information in regard to this metal must be received with caution.

Articles of Import.

Salt, though of no commercial interest, on account of its being a government monopoly, must be mentioned as probably the most weighty article which is imported into Hunan for consumption. The northern portion of the province receives its supplies from Hankau, the south-eastern departments from Canton. During the Taiping rebellion it was imported into Siang-tan both from Szechuen and Canton. The sale of salt offers some noteworthy features, inasmuch as no article of commerce ncreases so rapidly in price with the growing distance from the centres of supply as s the case with salt. The arbitrary price put upon it by the govenment amounts n fact to the same as if this commodity were encumbered by transit dues and squeezes tenfold as heavy as those which are levied on articles of luxury. The price of salt at Canton is $1 per picul. With the addition of freight alone it could be delivered at Siang-tan for less than $2. But going up the North river, its price increases with every Customs' Station that is passed. After having gone through six of these in a distance of 650 *li*, it is sold at Lo-chang-hien, the last city in Kwang-tung, at Tls. 2 per picul; 150 *li* farther on it reaches I-chang-hien, the first city in Hunan; and, after a transportation 90 *li* by land, the city of Chin-chau, where the price is 5,000 cash per picul. At Yung-hing-hien, 37 miles down the Lui river, it is sold at 6,500 cash. If the price increased steadily at this rate, it would reach at Siang-tan a figure above the actual selling price at that place, which is 7,000 cash per picul. Salt must be imported into Siang-tan via Hankau in order to enable the Government to sell it at this comparatively cheap price.

Foreign goods are almost altogether imported from Hankow, a small quantity taking still as of old the longer route from Canton to Siang-tan. This place appears to provide nearly the whole province. If transit dues and local squeezes were abolished, there is no doubt that southern Hunan would be supplied with foreign goods from Canton. Transit passes are a complete protection on the journey from Hankow to Siang-tan, but none at all, as I was told, on the route from Canton to Hunan.

Opium is chiefly imported from Hankau. That from Szechuen is not liked and little used, while Kweichau opium is preferred, and said to figure a little more largely in the trade. I saw less of opium smoking in Hunan than I did in the northern provinces. I was told that all retainers of mandarins who were in the habit of smoking opium have been dismissed throughout the province. None is said to be used by the Imperial soldiers.

Silk is a considerable article of importation. It is supplied both from Szechuen and Su-chau.

Sugar.—The main supply is from Canton, chiefly white and brown. A small proportion is imported from Szechuen and Fokien.

I have already mentioned the importation of the finer kinds of *Tobacco* and *Paper* from Fokien, and of *Cotton* from Hu-pe. *Tung-oil* and *White Wax* both from Szechuen are also to be mentioned, and no inconsiderable item appears to be the importation of "Kwang-ho or Canton goods, comprising all kinds of manufactured and fancy articles and including even foreign goods. Fans, candies, fruit, marriage presents, embroidery, carving, etc., figure under this head.

Roads of Commerce.

A review of the trade of Hunan shows, that it takes chiefly six directions: 1st, *to Hankow and the lower Yang-tse.* Exports: tea, coal, rice, hemp, tobacco, etc. Imports: foreign goods, salt, cotton, silk, opium. Freight to Hankow is from 80 to 90 cash per picul. There is a great deal of direct trade to Kiukiang, Wuhu, Nanking, Shanghai and chiefly Chinkiang.

2nd.—*To Fan-ching on the Han River*, a centre of the commerce with northern Hu-pe, Honan, Shansi and Shensi. I did not collect particulars regarding the trade by that route. A great deal of paper is exported by it.

3rd.—*To Fokien.* Export: hemp. Imports: tobacco, sugar, writing-paper. The route is direct, viâ Kiangsi, by navigable affluents of the Siang, Kia and Min rivers.

4th.—*To Canton.* Exports: tea, hemp, tea-oil, paper. Imports: salt for the southern departments, sugar, and a variety of manufactured goods. The road is up the Siang and Lui rivers, to a small place Whang-yan-ping, 215 miles from Siang-tan, thence up a small affluent of the Lui-ho (18 miles) to Chin-chau. Boats are changed at Whang-yan-ping, those going to Chin-chau loading only 30 or 40 piculs. After having crossed the Che-ing pass, very small boats are taken from I-chang-hien to Ping-shi (descending a small affluent of the Wu-shui river) larger ones from there to Lo-chang-hien, and good size cargo-boats, loading at least 300 piculs, from there to Canton, The entire distance on this route from Siang-tan to Canton is, according to my route surveys, 549 geographical miles.

The cost of freight per picul is as follows: from Siang-tan to Chin-chau, 233 miles (1,200 Hunan *li*), 90 cash; from Chin-chau to I-chang-hien 30 miles by land, the standard rate is 600 cash per picul; the price varies according to the ratio of the quantity of goods ready for transport to the available number of coolies. From I-chang to Canton, finally, a distance of 286 miles, freight is about 120 cash per picul. The total amount, from Siang-tan to Canton, is therefore about 870 cash per picul, or Tls. 8.1.0 per ton. I have already mentioned, in connection with the salt trade, the great number of customs stations passed on this route; some twenty, more or less.

5th.—*To Kwei-ling-fu and Kwangsi.* I am not informed about this trade, which is small.

6th.—*To Szechuen.* The two roads to Szechuen, the first going either by way of the Tai-ping canal and the Yang-tse (summer route), or by way of Yo-chau and the Yang-tse (winter rout); the second, by way of Chang-te-fu, Shin-chau-fu, Yu-yang-chau and Fu-chau, are said to be in use in about equal proportion. Exports: none of the produce of Hunan, excepting some Chang-te-fu cotton. Imports: silk, sugar, tung-oil, white-wax, opium. I have marked on the map a road leading entirely by land, through Tsz'-li-hien, Yung-ting-hien, Lung-shan-hien, Lai-fung-hien, Kien-kiang-hien to Pang-shui-hien, whence boats are taken, down the Kien-kiang to Fu-chau in Szechuen. It is taken by travellers, and those merchants who carry valuable goods in a small compass.

Another ancient and interesting trade road must be mentioned, which has, however, fallen into disuse of late years. It is that *to Kwei-chau and Yünnan.* It went up the Yuen river to Yuen-chau-fu and Wang-ping-tshau, which is the head of navigation, thence across several mountain passes to Kwei-yang-chau, and on to Yünnan. Copper, quicksilver, tin and lead from Yünnan and Kwei-chau were carried by the road through Hunan to the lower Yang-tse and Canton, while silk and

"Canton goods" (including foreign manufactures) were taken back in return. I learned also of an embassy, consisting of upwards of one hundred men, from the country of the "Mang-tse," reported to be situated 2,000 *li* "beyond Yünnan," which went twenty years ago, with tribute to Peking, and took this road in coming and returning. The trade with Kwei-chau came to a stand still seven or eight years ago when the Miau-tse took possession of some Fu and Hien cities in the region of the upper Yuen-kiang, which they still occupy. Since then, the trade of Kwei-chau and Yünnan is diverted to Szechuen.

Trade in Medicine.—I have omitted to mention the chief article of the trade of Siang-tan, in the first place, because it is in the main a transit trade, and because I wonld have had to mention it on every trade route both with the exports and imports. It is *Medicine*. I was told by the merchants of Siang-tan, that this city is the centre of trade in medicines for nearly the whole Empire. The drugs are imported from all quarters, and redistributed on the various commercial routes. The largest contributor, surpassing all others by far, is Szechuen. Kwei-chau, Yünnan, Kwang-si, Kwang-tung, Hunan are next in order, and large shipments arrive from the northern provinces. When I met on the Che-ling pass train after train of coolies and pack animals carrying big boxes carefully rendered water-proof, and I enquired what they contained, the answer was almost invariably, *Yau-tsai (medicine herbs)* from Szechuen. Large boats going south from Siang-tan were loaded with nothing but these drugs. It may have been just the season for that trade, but undoubtedly the latter is of vast dimensions. And yet I heard at Siang-tan, that the export of medicine to Hupeh, Honan, Shansi, Shensi, Chihli, and Shantung is much larger in quantity than that going south.

The question natura ly arises: what articles the Szechuen merchants purchase in return for their large imports? I learned that they buy at Siang-tan a portion of the imported cotton and foreign goods. This circumstance will partly account for the great exports of foreign goods from Hankau to Siang-tan, as compared with the amount of direct sales to Chungking. But making all due allowance for re-exports, there still remains a large quantity of foreign manufactures for consumption in Hunan. One of the causes of the demand for them is the considerable amount of money earned by the Hunan people; another may be found in the fact, that they were earlier acquainted with foreign goods than the inhabitants of most other provinces. The term "Canton goods," in which they are still included, though imported at present from Hankau, points to the customary receipts from there in former times. A third cause is, the scarcity of native grown cotton. Where people cannot supply their wants from the produce grown on their own fields, imported fabrics must find a more ready market, even among the agricultural population, than in those regions which are more favoured.

Prosperous Condition of the Inhabitants.—People in Eastern Hunan are, on an average, better dressed than the inhabitants of any other province I have visited. This is owing, in a great measure, to their cleanlier habits, and the desire evidently prevailing, to dress well and neatly, but no less to their general welfare. A considerable amount of money flows into the country, in return for tea, tea-oil, hemp, and coal. The large sums paid to the boatmen of Hunan, by the consumers of medicine and other transit goods in the other provinces, are another source of wealth, which is perhaps not secondary to the former as regards its influence upon the general well being, as it offers this advantage, that the money earned for freight is rapidly put in circulation.

I do not know whether the number of so-called "rich men" is greater in Hunan than it is in the north-eastern provinces, but it is certainly more conspicuous. This is the first province in which I have seen a considerable number of fine country seats owned by "rich men" who have retired from business. They invest their money in real estate and let this to farmers for rent. In an isolated and conspicuous position, usually on the slope of a hill, and surrounded by a cluster of trees, stands the showy mansion of the owner. The existence of this kind of landed aristocracy may be the cause of the fact that Hunan furnishes a great number of mandarins in proportion to

the number of its inhabitants. The young aspirants for office are instructed by private teachers, until they have passed the first examinations, when they enter the Yolo college (one of the Hanlin colleges), opposite Chang-sha-fu, to prepare for the examinations in the provincial capital. It contains more than one thousand pupils, mostly of the age of from 22 to 25. They study privately in their cells, and have but one professor, a high mandarin. He is, however, not a teacher, but is merely consulted by the pupils when they meet with difficulties in their studies. I visited the college. It is a large compound enclosed by a wall, and containing many fine buildings, which are kept clean and in excellent repair. On the Yolo-shan, a hill at the back of the college, has stood since time immemorial a copy of the Yu Tablet. I went up to it, but failed to get a complete copy of it, as it was getting dark when I reached it. I could not repeat my visit on the following day, as my first walk to the much dreaded and very independent crowd in the Yolo college, among which there are many who have a mandarin button, had alarmed the mandarins of Chang-sha-fu. When it became known several escorts of soldiers were sent out to protect me. I met them one by one, when I was quietly walking back. I do not consider the visit to the college by foreigners a safe enterprise, although I took my leave quite pleasantly, the students having at the time evidently not got quite over their surprise both at my visit and my polite behaviour to them. But one minute more, and the gates would have been shut upon me. Some small incidents made it quite evident how this literate class fears and hates the foreigners.

Tung-ting Lake.

I conclude this letter, which, in the leisure hours afforded by a stormy and slow passage, has grown to greater length than I anticipated, with some notes on the natural outlet of the basin of Hunan.

There was no lake to be seen when I travelled from Siang-tan to Yo-chau, the channel of the Siang river being now as well defined between banks here as it is higher up, with a width varying from 200 to 1,000 yards. It is joined, about eight miles above Yo-chau, by the Yuen river, which likewise continues its course as a river throughout the whole basin of the lake. The Tsi river empties into the Siang below Siang-yin-hien. Both the Siang and the Yuen have their rapids and shallows within the area of the lake itself. Boats navigating the Siang in this lowest portion of its course should draw no more then two feet of water, though thirty inches is still risked, while those going up the Yuen draw only sixteen inches. The lake bottom consists of a fine micaceous sand, which forms quicksands in the bed of the Siang. Boats getting badly aground at this season are lost, because the sand accumulates rapidly around them. These alluvial deposits slope down gradually from south te north. The banks of the Siang, which are more than thirty-five feet above the present water level near Siang-yin, get lower and lower as one descends the stream, and are only five or six feet high, near Yo-chau.

The formation of the lake, in the summer season, is not caused by the swelling of the rivers of Hunan. If the sea extended to Yo-chau and was at a level with the present state of water in the Yang-tse, then no lake would be formed. It is the rising of the Yang-tse, "the water coming from the sacred lakes of Szechuen," as Hunan people say, which gives origin to the formation of the lake, and would fill its basin without any contribution from the rivers of Hunan. When at its highest, the lake extends up the Siang river as high as Siang-yin-hien. Still water continues usually beyond. At Chang-sha-fu it lasted for thirty days in 1869, and for sixty days some seven or eight years ago, but in ordinary years the river continues flowing throughout the whole summer. There is never still water at Siang-tan.

As regards the Siang river at the latter place, and beyond, I read in your report on the Upper Yang-tse a statement of Dr. Dickson, that he found never less than ten feet for a distance of 300 miles above the lake, which would be equal to more than 100 miles beyond Hang-chau-fu. Circumstances were very different when I descended the river in January and February. It has at this season numerous rapids and shallows, the most dangerous of which are a short distance above Siang-tan.