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"POSSIBILITIES AND THE MEANS OF DEVELOPMENT OF COAL-MINING IN SHISHA WALANG, DDARE SOUF AND SURROUNDING REGIONS".

Introduction.

According to the programme of my geological and exploration works in Afghanistan, elaborated by His Excellency Rahimullah Khan, Minister of Mines, after completing the investigations of the coal occurrences in Ghorband Valley, Ishpushta and Barfak, I should begin the geological exploration of Shisha Walang, Darre Souf and sourrounding regions.

Becase of the vastness of this area and because of the shortness of the time /about two month/ I have at my disposal this year, I proposed to His Excellency Rahimullah Khan, Minister of Mines, that the most rational way of beginning the geological exploration of this area will be to make at first the aerial reconnaisance flights over that area in order to get the general idea of the geological structure of that part of the country and subsequently to execute the field geological mapping of Shisha Walang region. When His Excellency Rahimullah Khan accepted my proposal then thanks to the propitious attitude to that plan of His Royal Highness Sardar Muhammad Hashim Khan, the Prime Minister of Afghanistan - His Royal Highness Sardar Shah Mahmud Khan, Minister of War and His Excellency Muhammad Ihsan Khan, Chief Commander of the Afghan Royal Air Force, I could leave Kabul in the military airplane on the August 29th, 1946, for Dehdadi near Mazar-i Sherif, which was my base landing place from which I executed the reconnaisance flights.

During my stay in Dehdadi I was a guest of the Commander General of Mazar-i-Sherif H.E. Allahdad Khan, to whom I owe my sincere thankfullness for his kind care and for all facilities he made for me. It is also my pleasant duty to thank His Excellency Gul Ahmad Khan, Governor of Mazar-i-Sherif for the interest he has shown to my work

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and for hism promise of help and protection during my geological field work in the regions xxlxxgkxx under his governorship. My last but not least thanks are due to the officers of the Royal Afghan Air-Force - with whom I had pleasure to make the flights.

The purpose of my reconnaissance flights was to examine whether the area limited by the localities Chehil Dukhteran, Kotal-i-Kabr-i-Afghan Chail, Katal-i-Sabz and Saribum, Sadmarda, Komach, Burj-i-Hasani is really a plateau covered only by thick Cretaceous limestones without any outcrops of the older formations - or on the contrary there are in this area streams and deep valleys in which might be found outcrops of Saighan Series with coal seams. Topographical maps published by the Government of India /scale 1 : 1.000.000/ which I had at my disposal were too inaccurate to depend upon. Confirmation of the existence or non-existence of the outcrops of Saighan Series on this plateau was very important for me, because in the first case it would be necessary not only to make a geological map of the deep valleys limiting the above mentionned area from west and east, but also of this areas on the plateau in which streams and deep valleys exist.

The secon aim of my flight was to make general geological observatio along the valleys especially in the points of outcrops of Saighan Seri and to find if possible new points of larger accumulations of coal sea

The third point of my program wass to take the aerial photographs o more important areas observed during my reconnaissance flights.

As the result of my aerial geological observations I could ascertai that the above mentionned area of my future geological work forms real a plateau, the upper portion of which is xxxxx built of comparatively flat lying strata of Cretaceous limestones. On this plateau I could no notice any outcrops of Saighan Series.

My efforts to find the new points with larger accumulations of coal seams in this area did not succeed. Since above the valleys /in which

only the outcrops of Saighan Series exist/ were strong air current
which did not allow to fly low enough to accomplish those observati
because of danger of damaging the plane, according to the opinion o
my pilot colonel Muhammad Khan. It is therefore necessary to carry
in thtese regions geological investigations in the field. But I did
succeed in making gxxkxgixxixixxxxikgxxk very important general geo
logical ixxxxxigxxxxxx observations concerning the geological struc
ture of this area. Namely I could not only ascertain, that ikxxx
this entire regionx was formed of the comparatively flat lying lime
stone beds, but also that in some places on that surface there are
clearly visible rather narrow and short zones of folding /brahy-ant
clinal type/ of those limestone beds, having in Southern part of th
investigated area the general trend parallel to the belt of Hindu-
Kush /WSW - ENE/, and than in the direction to Darre Souf changing
its trend in a fan-like manner through W - E /in Ab Khorak/ to
WNW - ESE /in Shisha Walang/. Initially those folds protruded above
the normal level of flatly lying limestones and were object of deep
xx erosion, which took away firstly the cover of Cretaceous limesto
and than disclosed the underlying beds of Saighan Series /shales,
sandstones and coal beds/. In those parts in which the Saighan Seri
was disclosed the erosion progressed much more rapidly, than in the
surrounding regions of limestones, which being very hard and compact
resisted to the erosion far more, tan the soft Saighan Series Strata
Now visible state of geological and morphological conditions in that
area is the result of the above described geological processes: on
the area of flatly lying limestones there are only in some places,
along the generally narrow stream valleys, the enlarged and deepened portions
in which several hundreds meters x thick strata of Saighan Series
were uncovered. Those enlarged and deepened portions correspond
exactly to the above mentionned zones of folding of limestone beds.
It is evident that the folding of limestones was accompanied by the

folding of the underlying strata of Saighan Series - but to the single, large, gentle fold of hard limestones, correspond several small, comparatively steep folds of shales sandstones and coal beds of Saighan Series.

From those observations it is possible to draw the following practical conclusions concerning the geological exploration of this region for coal:

1/ the most convenient areas for rapid geological exploration and exploitation of coal are the zones of folding of Cretaceous limestones and the underlying Saighan Series strata. The detection of those zones should be the aim of geological mapping of that area and can be done more rapidly with the help of aerial surveying of this region.

2/ those zones of folding posses unfortunately rather unpleasant not favorable characteristic features for the mining exploatation, namely the coal bearing formation in those places is rather intensively folded and the rapidly progressing erosion of Saighan Series strata generally took away the greatest portion of the coal bearing formation, the remains of which form generally rather steep, narrow and small mountain ranges, with very steppxly inclined coal beds .

3/ large areas of flatly lying limestones may posses underneath a well developed coal bearing formation . Generally coal beds in those places will lie almost horizontally, or at the most willbe rather gen gently folded, and therefore better suited for the mining exploitatio on large scale than theareas of narrow folded zones. But it is also evident that not all areas of flatly lying limestones will posses underneath the Saighan Seriesx, and even when the Saighan Series wil be present, it may or may not contain enough coal beds to justify the mining exploitation. To find those areas with sufficient amount of coal beds it will be necessary to execute a very lxxklong, troublesome and costly exploration exclusively by means of boreholes, which must be located on the comparatively high plateaus devoid of water and therefore the expensive transport of water for boreholes will be necessary. To execute this exploration we do not have at present time enogh knoledge of the coal bearing formation itself as well as Saighan Series on the whole and also the knoledge of the general ~~xx~~ geology of the region. Therefore we do not possess now enogh criteriums by means of which we could, from the vast areas of the flat lying limestones, select the portions under which there is the probability of finding a well developped coal bearing formation. It should be also pointed out that even in the case of finding a portion with good coal reserve, the problem of the shaft sinking in this region will be a difficult one not only because of the comparatively great depth to the coal bearing formation, but also because of the large amount of water which will be encountered on the boundary between the limestone and the Saighan Series strata, and it might be necessary in order to pass trough these water bearing strata, to ~~xxxxx~~ employ a very costly freezing procedure.

Since the problem of supply of coal for Afghanistan is a very urgent one and must be solved as soon as possible it seems neccessary to limit now the geològical exploration to the regions in which this exploration may be rapidly executed by means of trenches and in exceptional cases by means of deep borings. In those regions, that is in places where the coal bearing formation outcrops on the surface of the earth /zones of narrow folds/ - not only the geològical exploration is easier, but also the exploitation of coal may be executed in a cheap way by means of adits, which is less expensive than by the means of shafts.

Now refaring to the third and last pxoint of my reconnaissance flying programme, that is to the aerial photographs - I was informed, that according to the military aerial regulations, I am not allowed to take those photographs personally, and major Muhammad Arif Khan was very kind to take them by means of large, aerial military camera. Unfortunately all points I indicated could not be taken, because in some of them it was necessary to take several times the picture, and I had only a limited amount of plates at my disposal. It is true that those aerial photographs /which I annex to this paper/ were not succeded, but it seems to me xxx , that now not only the question of good aerial photographs, but also the much more important question of aerial maps of Chisha Salang, Darre Souf and surrounding regions may be easily solved - becauce now all necessary outfit for aerial surveying is in Kabul and also mr. Schildknecht, specialist for aerial surveying, engaged by the Afghan Government,had already began the preliminary work necessary for aerial surveying of Afghanistan.

For the quick geological exploration of the country situated between Chahil Dukhtaran, Chail, Ab Khorak and Doshi, Pul-i-Khomri, GHaibak aerial map would be of greatest value because by the means of it will be possible to select rapidly the narrow zones of folding in the flatly lying limestone areas, which will form the main object of detailed geological exploration for coal in next future.

If the problem of finding the best area for coal exploatation in that part of Afghanistan should really be solved in the next three or two years, it seems necessary to begin the aerial survey of that region next spring. Aerial maps are indispensable not only for geological exploration but also they will form the main basis for the rational solution of road problem from the point of view of coal transport in that part of the country.

after my return from reconnaissance flights to Kabul I was occupie(with the preparationx of materials necessary for geological explorati(

in ~~xx~~ Shisha Walang region and I left Kabul on the September 10th, 1939. According to the instructions I got from His Excellency Rahimullah Khan, Minister of Mines, I went at first to Ishpushta in order to fix the direction of adit for the exploration of the coal bearing strata encountered there. On my way from Ishpushta to Shisha Walang His Excellency Minister of Mines informed me by telephone that I ~~xx~~ should stop at Chail, where in the valley of Khoja Kushta Ghulam Ali Khan discovered the new occurence of the coal bearing formation. ~~xxxxxxx~~ After I arrived to that place on the September the 18th, 1939 I found there an outcrop of a coal seam of 0,8 thickness on a length of about 100 meters. This coal was of rather good quality, hard and rather solid ~~xxx~~ without any larger intercalations of shale. Coal bed was lying rather flatly, about 2 meters under the surface of the earth on the gently inclined slope of the valley of the small stream. In a distance of about 100 meters below almost in the stream bed, there was also a coal seam of 0,8 thickness outcroping on a distance of few meters but the inclination of the bed was almost vertical.

No other outcrops of coal could be seen in that valley becauae Ghulam Ali Khan had just begun the exploration work in the day I came, therefore after few hours stay I went on my farther way to Shisha Walang. ~~xxxxxxxx~~ The occurence of the above mentionned coal bed /or coal bed has not for the time being of great value, because of the rather smal area on which the coal bed occurs, and due to the existing tectonic disturbances.. There is the possibility of the existence of the prolongation of the coal bed on the opposite side of the stream valley and the possibility of existence of the other coal beds in this regio but to say anything positively it is necessary to execute some exploration trenches. From both of the above mentioned points of the coal occurences one may probably exploit several hundreds tons of coal, but the underground exploitation of flat lying bed as well as that of vertical bed will not be easy. It is possible to exploit the flat lying coal bed by the open pitmethod, that is to remove at first the earth from above the coal bed on the whole area of its occurence, and then dig out the coal. But in this case it is necessary to take into account that the soil will be devastated, and the costs of removing of the overburden /[illegible] or more meters/ will be comparatively high.

I came to Chaubashak /Kotal-i-Kabre Afghan/ in Chisha Qalang region on the September 19-th 1939. I finished my fieldwork there on the October the 25-th 1939, after the snow had fallen for the second time and the frost did not allow for the continuation of geological exploration. As this exploration was the main aim of my travel to Chisha Qalang region I will describe it and the results of it fully in the next paragraphs of this paper.

In my way back to Kabul I was obliged according to the written instruction of His Excellency Fahimullah Khan, Minister of Mines, to see the new coal occurrences discovered by Gulam Ali Khan in the vicinity of Chail, in Sabz Kao valley. When I came to that place I fond that near the end of the above mentioned valley, there is a coal bed of [illegible],7 m thickness, but crushed and folded to such a degreex, that it is not suitable for expoitation. A little higher /up the valley/ there xxx ought to be , according to the opinion of my guide from Chail, a m coal seam of 1 m thickness, but I could not see it because the outcrop was covered by a thick coat of snow. Still higher there was a 3 m thick coal bed of rather good quality, hard, and only few cm of hanging wall and of foot wall were mixed with shale. This coal seam had the strike of almost [illegible] - [illegible], and the dip of [illegible]5° to the West; it was cutting obliq quely the x valley axis, but I could not see the outcrops of it on the opposite /southern/ slope of the valley, which was almost free of xxx snow. From the outcrops of that 3 m coal bed I went along the Narkxx about 200 m

Northern ridge of that valley, across the coal bearing strata, but only in one place I have seen a 0,7 m thick coal bed in the midst of black shales. Beside this coal bed in the intervals of a few tens of meters I have seen outcrops of black shales having sometimes several meters in thickness, but only with few layers of clean coal. In the end of the valley, under the thick cover of sandstones there was about twenty metrers thick layer of black shales, with several thin intercalations of clean coal, thicker beds were to such a degree intermixed with shales, that they will not be suitable for exploitation.

I could not perform moredetailed investigation in that area, because it was covered by snow, it is therefore necessary to execute the exploration works in Sabz Kao valley next spring on the basis of which the value of that coal occurence may be estimated.

After visiting Sabz Kao valley I continued my way back to Kabul. I have made only one stop for two days in Ishpushta in order to see the progress in driving the adit, and I came to Kabul on the November the 3-rd 1 3 .

1. Organization of the geological exploration works in Chaubashak, Chisha Kalang region.

The geological exploration in Chisha Kalang region, in the two months time I had at my disposal this year, could be executed in the two-fold way:

a/ to examine the general geological conditions of the region, and to select the areas of importance for the future detailed geological exploration. In this case it was not possible, becuase of of lack of time, to compute the coal reserves in each selected area.

b/ to examine thoroughly the best of the known up to that time coal bearing areas in that region, to compute the coal resources of that area and on that basis draw some conclusions concerning the entire

Shisha Walang region.

Just in that time I intended to begin the geological investigation in Shisha Walang, Gulam Ali Khan dicovered in that region,, South of Shaubashak village, near Kotal-i-Kabre Afghan, an area in which there were, according to his opinion, enormous coal reserves. I was therefore obliged to take the second of the above mentioned ways of performing the geological exploration, that is to make the detailed investigation of Shaubashak area in order to estimate the coal resources there.

Since the Shisha Walang and Darre Suf region was considered already by the former investigators /C.L.Griesbach, HH.Hayden, C.S.Fox/ as possessing a coal bearing formation with several thick exploitable seams - and the Saighan Series in which this coal beds occur have a thickness of about 1.000 meters - it was therefore necessary to establish also in which part of Saighan Series the coal bearing formation occurs, what is the thickness of that formation, how many coal seams it contains, what is the succession of those seams and whether there are any caracteristic petrografic horizons /key horizons/ which could be used as the basis of comparison in the future explorations of that region. To fulfil such a requirements it was necessary to disclose the section through the coal bearing formation in a fresh unweathered state - by means of the exploration trenches 1 to 2 meter deep perpendicularly to the strike of that formation. It was then necessary to perform a very detailed geological and petrographical analysis of the encountered beds, not so much to get the succession of these beds, as to find the key horizons and the tectonic disturbances /folds and faults/, which play a very important role in the estimation of the real thickness of the coal bearing zone.

Ghulam Ali Khan discovered in Shaubashak the coal bearing zone composed of 5 exploitable coal seams /0,5 - 2,9 meters thick/ having summarily 8,35 m. of coal, and found that the coal bearing zone in Shaubashak forms a syncline. It was therefore possible that the coal beds discovered by him in the southern wing of that syncline might be found also on the northern wing.

During the field investigations after my arrival in Shaubashak I could establish that on the mountain slope where Ghulam Ali discovered the coal beds, a few tens of meters higher above the highest seam discovered by him, there was also one coal seam of 0,58 m. thick, having in the hanging wall a layer of tuffite which forms a very important key horizon of that coal bearing zone. I found also on the mountain slope about 400 meters to the East of the above mentionned point, a new coal bearing zone with 14 coal beds /0,52 to 2,57 m. thick/ having sumarily 15,32 m coal.

This results of my investigation caused the necessity of executing two exploration trenches: trench No.1 / see figure 1/ intersecting the first mentionned coal bearing zone, and the trench No.2 /see figure 1/ intersecting the new rich coal bearing zone. Both trenches were situated on the Southern wing of the Shaubashak syncline.

After the trench No.1 was done I found that in its geological cross-section several folds and faults exist.

Detailed profiling of this strata encountered in the trench No.2 /which because of the morphology of the terrain was divided in three parts: 2a - 2b - 2c /has shown that in the lower part of that trench the Eastern prolongation of the coal bearing zone occurs overlin by the new coal bearing zone. The necessity of detailed profiling of the lower and the upper part of the trench No.2 was due to the fact that I wanted to establich whether on the distance of about 400 m between the trench No.1 and No.2 the coal beds undergo some changes /as far as the thickness and the caracter of these beds is concerned/, and also whether the key horizons and tectonic disturbances established by me in the geological cross-section of the trench No.1 may be also found in the trench No.II.

The upper part of the trench No.II /that is the trench No.II a/ intersectedthe Southern and the Northern wings of the Shaubashak syncline and in the middle part of that syncline I found a fault parallel to the axis of the syncline. On account of the existence of that fault it was necessary to state which of two possibilities occurs:

1/ whether in the Northern wing there are the same coal beds as in the Southern wing, but only shifted somewhat along the fault plane;

2/ or the Northern wing is composed of new strata,/not encountered in the Southern/ which may or may not contain coal beds.

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Since the solution of that problem was very important for the estimation of coal resources I decided to execute the trenches also on the Northern wing of Shaubashak syncline. These trenches were made in five sections: trench No. III, IV, V, VI, and VII. Snow falls and frosts in the end of October did not allow to finish the trench No.VII. Nevertheless the profiling of executed trenches has shown that generally the same coal beds exist on the both wings of Shaubashak syncline, and along the fold plane going trough the middle of syncline there is only a small shifting.

As the result of exploration work performed in Shaubashak 1.650 m of trenches were made from which Mr. Abdullah Khan profiled 320 m., I - 1.380 m.,and the 150 m. could not be profiled due to the snow falls. In this initial phase of the geological exploration it was necessary to carry the profiling as accurately as possible not as much as for the reason of establishing of very exact petrographic profile of the coal bearing formation, - as for the detection of the tectonic disturbances and key horizons. I was therefore obliged to execute the profiling myself, besides I must trace in the terrain the lines of trenches and watch that the workers executed properly the trenches

/ right breadth and depth/. The digging of trenches proceeded at first rather slowly, but when as the result of my proposal, the digging was paid not by hours of work but by current meters of performed trenches - then the work advanced more rapidly. But in the same time the workers had the tendecy to make narrow and not as deep trenches as it was necessary for the profiling - and I was obliged to watch personally the proper execution of the trenches. It was rather a troublesome task because on the whole seven trenches were made in different places - each three trenches at the same time, in the mountainous region and the distance between some of them was a few kilometers. Often I was obliged to climb many times in one day the steep mountain slopes having up to thousand meters in length. My conversation with workers was mostly by signs because I had no interpretor.

In the last period of exploration work another function was to be ~~xxx~~ performed, namely: the sampling of coal seams and spherosiderites. It was necessary to plane the surface of the coal bed in trench, then to cut out in each bed a channel of 20 cm in breadth and 10 cm ~~x~~ deep along the whole thickness of the bed, and to take out very thoroughly the entire material obtained. Because the trench had a depth of 1 - 2,5 m and in the lowest part the bredth was only 30 cm, this task was not very easy because one must pay great attention not to mix the coal sample with the shales falling during the sampling from the upper part of the trench. Due to the fact that the workers did not understand the importance of the very accurate execution of all functions of the sampling - I was obliged to perform all the about described functions myself.

I must apologise for describing in such a length my exploration work in Chaubashak, but I wanted to point out that it could not be as efficient as I wanted because I wasted my time doing all the secondary functions without any auxiliary staff to help me.

2. Geological description of Chaubashak syncline.

Before I begin a detailed description of the tectonic conditions of Chaubashak syncline and of the coal bearing formation encountered there, it is necessary to pay some attention to the general tectonic structure of Chishma Walang region and to describe briefly /mainly from the point of view of economic geology/ the strata taking part in that structure.

Chishma Walang region, as I have mentionned already before, belongs to the rather narrow zones of folding occuring in a plateau formed by a comparatively flatly lying Cretaceous limestones. This zone is composed in Chishma Walang region of several parallel folds, and is unsymmetrical, because aproaching to that zone from the SW direction we find at first a very broad /about 4 km/ flat anticline of Cretaceous limestone and immediately behind it about four very narrow and steep folds, which are clearly visible in Tang-i-Bazirgan /Chahil Dukhteran/. There is also another unsymmetry, namely a under the very broad, flat main anticline of Cretaceous limestone occurs about ten comparatively narrow folds of Saighan Series strata /Chaubashak syncline described later is one of them The last mentionned unsymmetry is due to the fact, that hard compact Cretaceous limestone yielded with difficulty to the folding, in contrast to the shales and sandstones of Saighan Series which might be more easily folded. Since in the time of forming of that zone of folding in Chishma Walang acted the same forces as well on Cretaceous limestones, as on Saighan Series strata - it is conceavable that the same force which could form only a broad, gentle anticline of limestones, pressed together the shales and sandstones in several narrow steep folds.

This comparatively simple tectonic conditions are somewhat complicated by the fact, that between Cretaceous limestones and the Saighan Series strata there is an unconformity, that is, that already before the Cretaceous limestones were laid down, the Saighan Series was to some degree folded and faulted. Since the post-Cretaceous folding in the limits of Saighan Series was put upon the pre-Cretaceous folding and faulting, then the more complicated tectonic structure resulted. The fact that th coal bearing Saighan Series in Shisha Talang xxx does not form a simple system of folds, but a complicated, beeing the result of the interferen of at least two tectonic movements /pre-Cretaceous and post-Cretaceous/ - is very important for the rational execution of geological exploratio and for evaluation of probable coal resources of that region.

Rocks occuring in Shisha Talang region may be subdivided according t their stratigraphical appurtenance into a/ Cretaceous formation, b/ Jurassic formation.

The rocks belonging to the Cretaceous formation are the following /in descending order/:

1/ limestones, hard, compact, consisting of almost pure calcium carbonate with a very small admixture of clayey and seditious substances. The thickness of this limestones may amount to 100 meters, but usual is less, what is due to partial erosion,

2/ marls, having a variable content of clayey substances and the thickness of 10 - 15 m,

3/ sandstones, in upper horizons rather hard, compact and yellow; in the middle part they become loose and have light grey colour; in the lower part they are redish. The thickness of sandstones is about 20 m.

Limestones because of their purity form a very good material for lime burning.

Marls may be used immediately for the xxxxfxxxxx production of cement, if they have the appropriate proportion of clayey substances. If not, they must be mixed with shales of the underlying Saighan Series strata, or with limestones. It is also possible to use for the productio of cement the mixture of limestones and shales without the marls. The resources of limestones in the nearest vicinity of Shaubashak are enormous, practically inexhaustible, so as the resources of shales. Therefore Shaubashak coal deposit /as well as any other coal deposit in that region/may form the basis for the establishing the cement industry.

Loose sandstones /almost sands/ occuring in the middle part of sandstone horizon may be used as the material for "sandfilling" which probably will be used in the future exploatation of coal seams. These loose sandstones may be also used for the production of glass if their purity is sufficient.

The rocks belonging to the Jurassic formation, or so-called Saighan Series of H.H.Hayden, consist in the first place of shales and in the second place of sandstones. Coal seams and spherosiderites, which form the minor constituence of these Series, occur almost entirely in shales. Saighan Series in Shisha Malang region has the thickness of about 1.000 meters, and the coal bearing formation forms only a part of its total thickness. It is therefore evident that the problem of division of Saighan Series and of distinguishing in it some caracteristic horizons has a great practical importance. There was only one investigator, namely C.L.Griesbach, who found in the Saighan Series of Shisha Malang region the following caracteristic horizons,in descending order :

1/ Sandstone and shale with Schizoneura,

2/ sandstone and shale with Equisetites columnaris,

3/ calcareous sandstone with Monotis salinaria and Halobia lommeli,

According to his opinion coal seams occur between 1/ and 2/, and also between 2/ and 3/. The importance and validity of that division was greatly shakened by H.H.Hayden, who proved, that the determination of fossils by C.L.Griesbach was either doubtful /Equisetites columnaris/ or inaccurate /Monotis salinaria, Halobia lommeli/. Therefore I could not take the division of Saighan Series made by C.L.Griesbach as the basis of my investigation. I had also no time during my field work to carry the paleontological research, and probably I will not have the time for it in future. Consequently I was obliged tox distinguish in the Saighan Series not the paleontological but the petrographical horizons, which can be more easily recognised in the field. Since sandston as well as shales, or coal seams and spherosiderites do not persist ove the wide areas, it was then necessary to find another caracteristic hor zone. Profiling of the trenches made by me has shown, that among the coal bearing formation there are tuffites, which form a very good carac teristic horizons. The determination of tuffites made by me megascopic ly should be confirmed by the means of thin sections under the microsco

According to my observation in Shisha Galang region the Saighan Seri may be subdivided in three parts:

1/ upper barren zone consisting of shales and sandstones /thickness 30 to 100 m/,

2/ coal bearing zone consisting of shales and sandstones with coal seam and lens-like accumulations of spherosiderites /thickness 500 to 600 m/

3/ lower barren zone /shales and sandstones/ having a thickness of abou 200 m.

Since my geological exploration in Shaubashak was limited to the detail investigation of the above mentioned coal bearing zone, only this zone will be described in the following pages.

Coal bearing zone forms in Shaubashak an unsymmetrical syncline the southern wing of which has an average strike of NW - SE and the dip /inclination/ of 51° to the north, but northern wing has xxxxxx an average strike of W - E and the dip 62° to the south. The direction of the axis of the syncline is WNW - ESE, and it dips slowly to ENE. In the southern wing I have observed some minor folds and faults. Northern win seems to be free from these tectonic disturbances.

Chaubashak syncline /as well as the whole area of Chisha Salang region/ has undergone a very deep erosion. The streams flowing along the strike of the strata, formed a small mountain range, elongated in the direction of the axis of the syncline. Smaller streams flowing obliquely to the strike of the strata have cut the range into several parts in which, due to erosion, the coal bearing zone has various thicknesses. Mountain range of Chaubashak syncline may be subdivided into the easter portion, where the coal bearing zone is almost completely developped, and the western portion having only the lower part of the above mentioned coal beäring zone.

Cross-section through the complete coal bearing zone of the eastern part of Chaubashak syncline /southern wing/ is shown in the geological cross-section of the trench No.11 /apendix No.1/, and figure No.1/. This coal bearing zone is caracterised by the existence of great number of coal seams : there are together 37 coal seams having a thickness from 0,2 - 2,22 m. Besides the coal seams there are also spherosiderite which may be of value as an object of mining exploitation. It is true, that the thickness of this spherosiderites is not very large /seldom above 0,3/, but their quality is usually very good. They could be used for the iron production if in Chisha Salang region exploitable coal seams of ~~smakt~~ coking coal could be found /That is very probable because C.L.Griesbach and C.S.Fox found in Chisha Salang region coking coal/, and if the creation of iron industry in that region would be intended. The nearest iron ore deposit occur south of Hindukush, and the transport of that ore to Chisha Salang region would be rather costly. It is therefore probable, that in such conditions could be possible to exploit and use the spherosiderites ~~xxxxxxxx~~ on the spot, notwithstanding comparatively high costs of their exploitation, which would be counterbalanced

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by very low cost of transport. It is interesting to note that in valleys of streams in Shisha Walang region very often occur large lumps of slag formed during iron smelting, for which these siderites were undoubtedly used. High cost of the exploitation of spherosiderites could be greatly reduced, if the shales underlying and overlying the siderites could be used for ceramic and cement industry and exploited together with the siderites.

Apendix No.2 shows the strata encoutered in the exploration trench No.I /western part of the south wing of the Shaubashak syncline - see figure 1/, forming the western prolongation of the lower part of the ~~xxx~~ above described coal bearing zone of the trench No.II. Compering the developpment of the lower part of the coal bearing zone in the exploration trench No.II and in the trench No.I it is evident that on the distance of 375 m, which separate those trenches, rather small differences are to be noted. The number of coal seams having the thickness of more than 0,5 m /which is the lower limit of workable thickness of coal seams/ is in both trenches the same, with the exception of the seam XV/I in the trench No.I, which has no counterpart in the trench No.II. Also the thickness of the barren strata between the coal seams is practically the same in both trenches. Somewhat greater differences exist in the thicknesses of coal seams. The folding of the coal bearing zone and the fault which were observed below the coal seams in the trench No.II are also observed ~~xxxxx~~ almost in the same place in the trench No.I.

Far greater differences in the developpment of the coal bearing zone ~~xxxxx~~ take place between the southern and the northern wing of the Shaubashak syncline, as is may be seen from the apendix No.3 showing the geological cross-section of the exploration trench No.III. This trench is situated on the northern wing of syncline /see figure 1/, just opposite the trench No.II. In both wings not only the thicknesses of coal seams varies in large limits but also the thicknesses of barren strata between them, what makes very difficult the identification and parallelization of coal seams. Comparing the coal seems encountered in the trench No.II and No.III, it may be stated, that in the trench No. III, the first three coal seams of the trench No.II are missing. Coal seam 3 was encountered in the trench No.II in a depth of 49,24 and in the trench No.III in the depth 13,9 m. This upward shifting of coal seams of the northern wing as compared with the southern is caused not only by the steeper angle of the deep of coal seams on the northern wing, but probably also is connected with the existence of the fold going through the center of the syncline /as I have mentionned it above/ in the trench No.III on the distance of 110 m below the coal seam III only six coal seams were encountered having the total thickness of 4,19 m , but on the other hand in the trench No.II on the same distance below the coal seam III nine coal seams were found having the total thickness of 5,91 m.

Exploration trench No.IV is situated about 420 m to the west from the trench No.III /northern wing of Shaubashak syncline - see figure 1/. This trench was dug out in the last days of my stay in Shaubashak and was prfiled by Dr.Abdallah Khan. Being occupied with the sampling of coal seams I could not prove whether the strata encountered in the ~~xxxx~~ trench No.IV forms immediate succession of the strata of the trench No.III. But comparing now the thicknesses of the strata encountered in the trench No.III, IV, and V - with the thicknesses of corresponding strata on the southern wing of Shaubashak syncline I came to the conclusion, that probably the strata of the trench No.IV forms immediate succession of the strata of the trench No.III.

Trench No.V is situated 50 m to the West of the trench No.IV /see figure 1/, and corresponds to the upper part of the trench No.I, containing no coal seams.

Similarily to the conditions found in the cross-section of the trench No.III, also in the trench No.IV /see apendix No.3/ the number of the coal seams, as well as the total thickness of the coal seams is less than in the corresponding part of the southern wing.

The most uniform developpment of the coal seams in the northern and southern wing shows the lower part of the coal bearing zone, encountered in the exploration trenches No.VI and VII /see apendix No.5 and figure 1/, forming almost immediate northern prolongation of the trench No.I. The coal seams B, C, and D, found in the trench No.I were not observed in the trench No.VII, because the folding and faulting observed in southern wing below the coal seem XIX does not seem to occur in the northern wing. It is therefore probable that the strata encountered in the trench No.VII form the normal sequence, since in that trench below the coal seem XIX no other seam occurs and the coal seem A, B, C, D, of the trench No.I and No.II may correspond to some of the upper coal seems / I - XIX /.

The quality of coal in the Shaubashak syncline varies in large limits: generally the coal seams are rather clean, hard, but also the coal beds occur which are mixed with the shale and sometimes also are powdery and crushed. The moisture content of most coal beds is rather high, so that when the fresh coal is exposed to the air it dries up, exsication fissure are formed and cause that it falls to small pieces. It may be forseen even now that the crude coal obtained during the exploitation of the coal deposit of that region will contain at least 30% of coal powder /fines/, which has comparatively low value and therefore cannot be transported for long distances.

The possibilities of the rational use of that coal powder -/fines/ are twofold:

1/ briquetting,

2/ creation in the vicinity of coal mines such factories, which may use coal powder in such a state as it is delivered from the mine.

Briquetting is an expensive operation, because besides the rather costly machinery it demands also the admixture to the coal powder /fines/ certain ammount of binding medium /asphalt, pitch, glue/. It is also possible to make briquette without any binding medium, but in this case the briquetting machinery must be heavier, the temperature to which te coal powder must be heated is higher, and therefore the consumption of energy is greater. Briquetting without the binding medium may cost even more than the briquetting with asphalt, pitch or glue, what of course depends on the local ~~maxx~~ prices of machinery, binding medium and energy.

The conditions for the creation of factories using up immediately the coal powder are in Shicha Balang region exceptionally favorable, because all rough material necessary for the factories producing electricity, lime, cement, probably iron, and even for ceramic factories are available on the spot.

3. Evaluation of the coal resources of Shambashak syncline.

Before the estimation of the coal ressources is made it is necessary to name the coal seams encountered in the coal bearing formation in Shambashak and to perform the parallelisation of coal seams found in different geological sections through the Shambashak syncline.

In the estimate of coal ressources it is generally accepted that the coal seams having a thickness less than 0,5 m , are not taken in to account because the exploitation cost of such thin coal seams is too high. Therefore I have made for the purpose of calculation of coal reserves the generalized geological cross-sections, in which only the thicknesses of coal beds and of barren strata between them were given disregarding, the coal seams of thicknesses less than 0,5 m.

As the basis of parallelisation I took the ~~mxxxxx~~ complete cross-section of the coal bearing zone, as shown in the trench No.II, and I have marked all coal seams encountered there with the successive Roman numerals , beginning from the upmost coal seam /No.I/to the seam No.XIX. Below the coal seam No.XIX /about 17 m/ there is a fold and fa therefore the coal seams lying underneath that fold do not belong to th continuous coal bearing formation /coal seams No.I to No.XIX/ and recei ved as the names the successive capitals A, B, C, D. All the above xxxx mentionned coal seams have the thicknesses greater than 0,5 mk with the exception of the coal seamx XV which has only 0,42 m, but I proved in the other points along the strike of that coal bed, that its thickness is generally greater than 0,5 m and in the profile of the trench No.II there is only a local diminution of the thickness.

Parallelization of the coal seams encountered in the trench No.I with the lower portion of the above mentionned coal seams /XV - XIX/ was comparatively easy /see apendix No.7/. In the trench No.I between the coal seam XV and XVI there is the coal seam XV/I and also below the seam XIX - the coal seam XIX/I, which have no counter part in the coal seams of the trench No.II. The coal seam XIX/I and the coal seam A cannot correspond each other, because in the trench No.I the coal seam XIX/I is above the faix fault and in the trench No.II the coal seam A is below that fault, and the distance between the fault and the coal seam XIX in the trench No.I is 33,11 m , that is nearly twice as much as in the trench No.II.

As it may be seen from the apendix No.8,9,and 10, showing the genera lised geological cross-sections of the trenches No.III, IV, V, VI, and VII, - only the coal seams III, XV, XVI, and XVII could be identified on the northern wing of Shambashak syncline. The identification of the coal seams IV, VII, X, XII, XIII, XVIII, and XIX, is doubtful, and the coal seams I, II, V, VI, VIII, IX, XI, XIV, are probably missing in the northern wing of Shambashak syncline.

To calculate the coal resources of Shaubashak syncline I divided it into four segments /see figure 1/:

1/ estern segment of the southern wing ,

2/ western segment of the southern wing,

3/ estern segment of the northern wing,

4/ western segment of the northern wing.

The boundary between the eastern and western segments goes in the half a distance between the trench No.I and II to the northern wing /perpendicularly to the strike/. The boundary between the northern and southern wing is form by the axis of the syncline.

The length of the single segments /along the strike/ is given on the figure 1.

To compute the breadth of each coal seam /along the dip/ in those segments, the generalized cross-sections through the eastern /figure 2/ and the western part /figure 3/ of the Shaubashak syncline were designe ~~xhaxkxahxkxxxxxelixx~~ In order to get the ~~xixx~~ mean breadth of all coal beds in each segment not only the length of each coal seam /along the dip/ from figure 2 and figure 3 was taken into acccount, but also the thickness of each coal seam.

Total thicknesses of the exploitable coal seams is given in the above mentionned generalized geological cross-section /apendix 6 to 10/

As the range of Shaubashak syncline had a rather irregular form, it is necessary to diminish the computed tonnage of each segment by 20 - 40%, according to the smaller or greater morphological irregularity of each segment.

__Eastern segment of the southern wing.__

a. Length /along the strike/..............500 m

b. Breadth/along the dip/.................211,6 m

c. Thickness of the coal seams.............9,38 m

a x b x c = 500 x 211,6 x 9,38 = 992.600 t

Subtracting 35% for morphological irregularities....645.000 t

<u>Easterns segment of the southern wing.</u>

a. Length /along the strike/...............600 m

b. Breadth /along the dip/..................276,4 m

c. Thickness of the coal seams..............21,97 m

a x b x c = 600 x 276,4 x 21,97 = 3.645.900 t

Subtracting 20% for morphological irregularities....2.916.000 t

<u>Western segment of the northern wing.</u>

a. Length /along the strike/................440 m

b. Breadth /along the dip/..................171 m

c. Thickness of coal seams...................5,88 m

a x b x c = 440 x 171 x 5,88 = 496.892 t

Subtracting 40% for morphological irregularities.....298.000 t.

<u>Eastern segment of the northern wing.</u>

a. Length /along the strike/................600 m

b. Breadth /along the dip/..................126,2 m

c. Thickness of the coal seams...............7,76 m

a x b x c = 600 x 126,2 x 7, 76 = 587.700 t

Subtracting 35% for morphological irregularities......382.000 t

~~xxx~~ <u>Total amount of the gross coal reserves of Shoubashak syncline</u>

Western segment of the ~~northern~~ southern wing........ 645.000 t

Eastern segment of the southern wing.......2.916.000 t

Western segment of the northern wing..........298.000 t

Eastern segment of the northern wing..........382.000 t

<u>Total.......4.241.000 t</u>

The total amount of the gross coal reserves of Shoubashak syncline is therefore four millions two hundred forty one thousands tons.

In order to get the coal reserves which may be exploited out of Shaubashak syncline it is necessary to subtract from the above given gross coal resources a certain percentage for the losses of coal during exploitation, depending on the system of exploitation used.

It is generally accepted in the mining or applied geology to distinguish three categories of reserves of coal, or other useful minerals:
1/ proven /or blocked out/ reserves, to get those reserves all three dimensions necessary for calculation of cubature /that is breadth, length and thickness/ must be exactly determined in sufficient number of points. This is the highest category of reserves.
2/ possible reserves: the cubature necessary for the estimate of those reserves is computed on the basis of two dimensions sufficiently accurately determined, while the third one could not be fixed with satisfactory exactitude and therefore possible reserves possess a certain dgree of uncertainty.
3/ probable reserves: computation of cubature in this case is done by multiplying only one exactly determined dimension while the remaining two could not be fixed in sufficient number of points, but were taken on the basis of geological premises. Probable reserves have still higher degree of uncertainty, as compared with possible reserves.

Coal reserves calculated by me in Shaubashak belong to the category of possible coal reserves, because one dimension /the breadth along the dip/ could not be determined by me with adequate accuracy in the field, and I was obliged to assume that the thicknesses of the coal seams observed by me in the exploration trenches persist to the fault going through the central part of the syncline. In order to change the category of coal reserves from possible to proven it would be necessary to establish the breadth along the dip by means of boreholes which should be situated in the central part of the syncline.

it is possible to evaluate the coal reserves of that region not in tens of millions of tons, but in hundreds of millions. But such an estimate of coal reserves is inadmissible. It is true that on the line connecting the Shaubashak syncline with that of Jhari Sokhta there exist a syncline in a distance of about 2 km of Shaubashak, but even if this syncline would belong to the same fold as Jhari Sokhta and Shaubashak, it is impossible to calculate the coal reserves on that basis.

1. General conclusions.

It is difficult for me at present to estimate the coal reserves in the whole Chisha Talang region because my principal task being the evaluation of coal reserves of Shaubashak, I had no time to perform the more detailed investigation of that region - but I do have some field observations, permitting to discuss generally the possibilities of that region.

Tectonic conditions in Chisha Talang region are not very simple. Although as I had mentionned already above, this region was folded /the folds occur not only to the south of Shaubashak syncline but also to the north/ nevertheless this folding do not possess the regular trend of ENE - WSW, as one might think, but it is more complicated being the result of the interference of at least two folding periods - pre-Cretaceous and post-Cretaceous.

Considering simplified tectonic conditions /with only one folding period/ one may greatly over estimate the importance of the possible prolongation of Shaubashak syncline in eastern and western directions. Taking into account that in that syncline a coal bearing zone was found having a thickness of about 600 meters and more than 20 coal seams /with 24 m of coal/, and assuming that this syncline has a continuous course of about four kilometers ~~ta~~/from Shaubashak to Jhari Sokhta/ it is possible to evaluate the coal reserves of that region not in tens of millions of tons, but in hundreds of millions. But such an estimate of coal reserves is inadmissible. It is true that on the line connecting the Shaubashak syncline with that of Jhari Sokhta there exist a syncline in a distance of about 2 km of Shaubashak, but even if this syncline would belong to the same fold as Jhari Sokhta and Shaubashak, it is impossible to calculate the coal reserves on that ~~basi~~ basis. Since for the calculation of coal reserves it is necessary to prove the existence of that syncline on the whole length of 4 km and not only in three points, in a distance of 2 km between them. Secondly demonstration should be made of the existencez of coal formation, of number and of thicknesses of coal seams on that whole distance.

In order to answer the qestion of the existence of such continuous coal seams af on that whole area it is indispensable to discuss at first some general prblems concerning the coal deposits. There are namely two types of coal bearing bassins:

1/ So called paralic coal bassins formed near the sea shore and containing marine sediments with the exception of coal seams which belong to the terrestrial sediments,

2/ So called limnic coal bassins, formed far from sea cost and devoid entirely of marine sediments.

n Paralic coal bassins to which all the greatest coal bassins of Europe and America belong, occupy large areas and are characterized by the constancy of coal seams /for instance Pittsburgh coal seam in the Alleghany bassin in United States of North America occupies an area of 10.000 square km/.

Limnic coal bassins such as that of central France, Saar in Germany etc. occupy comparatively small areas , coal seams are rather irregular they change their thicknesses and qualities on small distances, and have more lens-like than bed shape.

Coal bassins of Northern Afghanistan were formed in the mid-continental area, far from the sea coast and sediments filling those bassins are of terrestrial, not of marine origin. Therefore those bassins must be considered as limnic. In accordance withk that the coal bassins of Northern Afghanistan have the characteristic features of coal bassins: they occupy comparatively small areas, as it may be seen in Ishpushta, Barfak, Narin, Ishkamish, Shisha Salang, Chail, etc. They possess also the second characteristic feature of the limnic coal bassins, namely coal occurs in the cross-sectios of those basins not as regular seams or beds, but as lenses /Ishpushta, Barfak and to certain degree also Harin and Ishkamish/.

It ought to be noted, that in Ishpushta and Barfak in the whole xkxx thickness of the Saighan Series there is only one horizon of exploitabl coal lenses. The length of those lenses is about 100 m and they are separated by rather large, practically barren areas. On the cotrary in Shaubashak the coal bearing formation consists of more than twenty explàitable coal sems. The horizontal extension of some of coal seams there in the direction of strike is about 1000 m, and in the direction of dip probably up to 600 m or even more; the other coal seams thin out much more rapidly. Without any doubt the economic importance ofthe whole Shisha Walang region is far greater than that of Ishpushta and Barfak. Resuming the above mentioned observations it may be stated, that in the nothern direction from Ishpushta and Barfak to Shisha Walang in the coal bearing formation of Saighan Series increases the number xxx of exploitable coal seamxs and also the horizontal extension of single coal seam.

In order to prove whether the continous belt of the coal bearing formation exists between Jhari Sokhta and Shaubashak it is necessary to execute the exploration trenches in several points between those localities. Not having performed tese investigations, it is better fxx for the time being not to assume the existence of continuous coal bearing formation between Shaubashak and Jhari Sokhta, because the Jrassic coal deposits of Northern Afghanistan belong to the limnic coal basins which are characterized by lense-like coal seams and rather small area of their occurrence.

If however the coal bearing zone extended continmously between Shaubashak and Jhari Sokhta, even ten the coal reseves of that coal bearin belt will probably be not very high, due to several reasons. I stated namely in the Shaubashak syncline, that the Saighan Series consists of

1/ upper barren zone /thickness up to 100 m/,

2/ coal bearing zone /thickness up to 600 m/,

3/ lower barren zone /thickness up to 200 m/,

Entire coal bearing zone occurs only in a comparatively small area of the eastern /highest/ part of Shaubashak syncline, and the western /lower/ part of that syncline is deprived of upper part of the coal bearing zone, which on the last mentioned area was eroded. Between Jhari Sokhta and Shaubashak there are only small hills considerably lower than Shaubashak range, thxxxxxix it is therefore probable that between those localities is developed only the lower part of the coal bearing zone txxxxxxxxxxx, and in some parts the whole coal bearing zone might be eroded. In the vicinity of Jhari Sokhta the coal bearing formation was not so much destroyed by erosion, the coal bearing zone is here more complete and contains thick coál seams, but I cannot evaluate the coal reserves of that locality without the detailed in=vestigation.

It remains still to discuss the question of the possible prolongation of the coal bearing zone to the east of Shaubashak. Calculating the coal reserves of that syncline I prolonged the coal seams encountered in the trench xxxxxxx no.III about 430 m to the east. But already in that part one may observe that the coal seams change somewhat the strike and the dip. Still farther to the east, up to the outcrop of Cretaceous lime=stones, the morphology of the terrain changes entirely: instead of steep, small mountain ranges, as in Shaubashak, here is the terrain rather flat and almost entirely devoid of outcrops of Saighan Series. From this change of morphology one may deduce, that probably also the tectonic conditions in that area are different than in Shaubashak? It is possible, that in xxxx this area occur the same strata as in Shau=bashak, but lying more flatly; on the other hand it is also possible that there are heresome other strata belonging to the Saighan Series, which may even not contain at all the coal beds. To resolve the doubts which of those eventualities occurs , it is necessary to perform the detailed investigation of that area by means of deep boreholes.

Obviously here as well as in Jhari Sokhta exist possibilities of encountering larger coal deposits, but these possibilities must be proved by farther exploration.

After my arrival from Shambashak to Kabul, aswering the question of His Excellency Rahimullah Khan, Minister of Mines, I said that coal reserves of that part of the country may amount to 60 milions tons. Of course giving these reserves I have in mind not only Shisha Kalang region, but also other areas seen by me /Ab-Khorak, Cheil, Kotal-i-Sabz etc./. In all these areas the Saighan Series has rather great thickness, in some of them there are thick coal seams, in the other there is possibility of existence of exploitable seams, but in none of those localities a detailed exploration was made, on the basis of which it would be possible to calculate the coal reserves, or to judge the conditions of future mining exploitation.

It seems very probable, taht among those areas such may be found, which with regard to their geological structure /small inclination, lack of folding and faulting/, to their morphological features /comparatively flat area, not dissected by valleys of streams/, and with regard to their geographical situation /small distance from Kabul, or from the convenient lines of communication/ will permit the easier and therefore cheaper explotacion of coal, or diminution of transport costms - and consequently will allow for tha considerable reduction of net costs of 1 t of exploited coal.

One may forsee even now, that net costs of 1 t of coal from Shaubashak or surrounding regions will be comparatively high, due to the high cost of exploitation, timber and x transport. But just in the first period of the introduction of the coal on the Afghan market, the price

/which depends on the net costs/ of that coal should be as low as possible, since xx on the low price depends the possibility of wide use of coal for industrial and other purposes. Therefore the first coal mine of Afghanistan ought to be situated in the most convenient area from geographical point of vue, and to have the best geological x and morphological conditions, because only in this case the net costs and consequently the price of coal willbe the lowest. Shaubashak do not correspond to those requirements, because it is only the first coal deposit, which can be exploited on a larger scale, but its geo= logical and morphological conditions are not especially favorable.

According to my opinion it is necessary to perform at first the geological exploration of all areas where the coal bearing formation x with exploitable coal seams may occur, xxx then to select the best area for coal mine and to connect it with the nearest transport line. Building already now the road to Shaubashak, a certain line of xxxxxxx development of the coal industry inxxxx that whole region will be fixed. When after building the road , another area better suited for coal exploitation xxxxxxxxxxxx then Shaubashak will be found /not situated in the vicinity of that road/ - it would be probably necessary to stop the exploitation of Shabashak coal deposit, and to build a new road to that second area of mining exploitation.

Solving the problem of the transport of coal from the mine to Kabul by means of lories, it is necessary to take into consideration that the coal transport by motor cars on the distances of several xxxx hundreds of kilometers will never be profitable, and must be replaced in future by railway transport. In regard to the comparatively small tonnage, which will be transported by means of that railway, rather small cost of the construction of the narrow gauge railway track, and of narrow gauge x rolling stock, as compared with the broad gauge railway - the best solution will be to accept the narrow gauge railway. There=

fore designing connecting the coal mine with next line of transport it should be taken into account, that alongside of the road the railway track /narrow gauge/ will be laid in future. Obviously the best solution would be , if this railway track built for coal transport purposes , could be at the same time a part of future main transit railway road connecting Termez with Chaman.

Dr. Ing.Adam Brath

Kabul 31.XII.1939.