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REPORT

REHABILITATION COAL MINES

ITALY

VOLUME III

Istrian Peninsula

Central and Southern Italy

Compiled by:

Solid Fuels Branch
Fuels and Lubricants Division
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Note: It will be very helpful to the Solid Fuels Branch, OQMG, if officers charged with rehabilitation of coal mines will communicate directly on conditions found in order to assist in expediting materials and in future planning.

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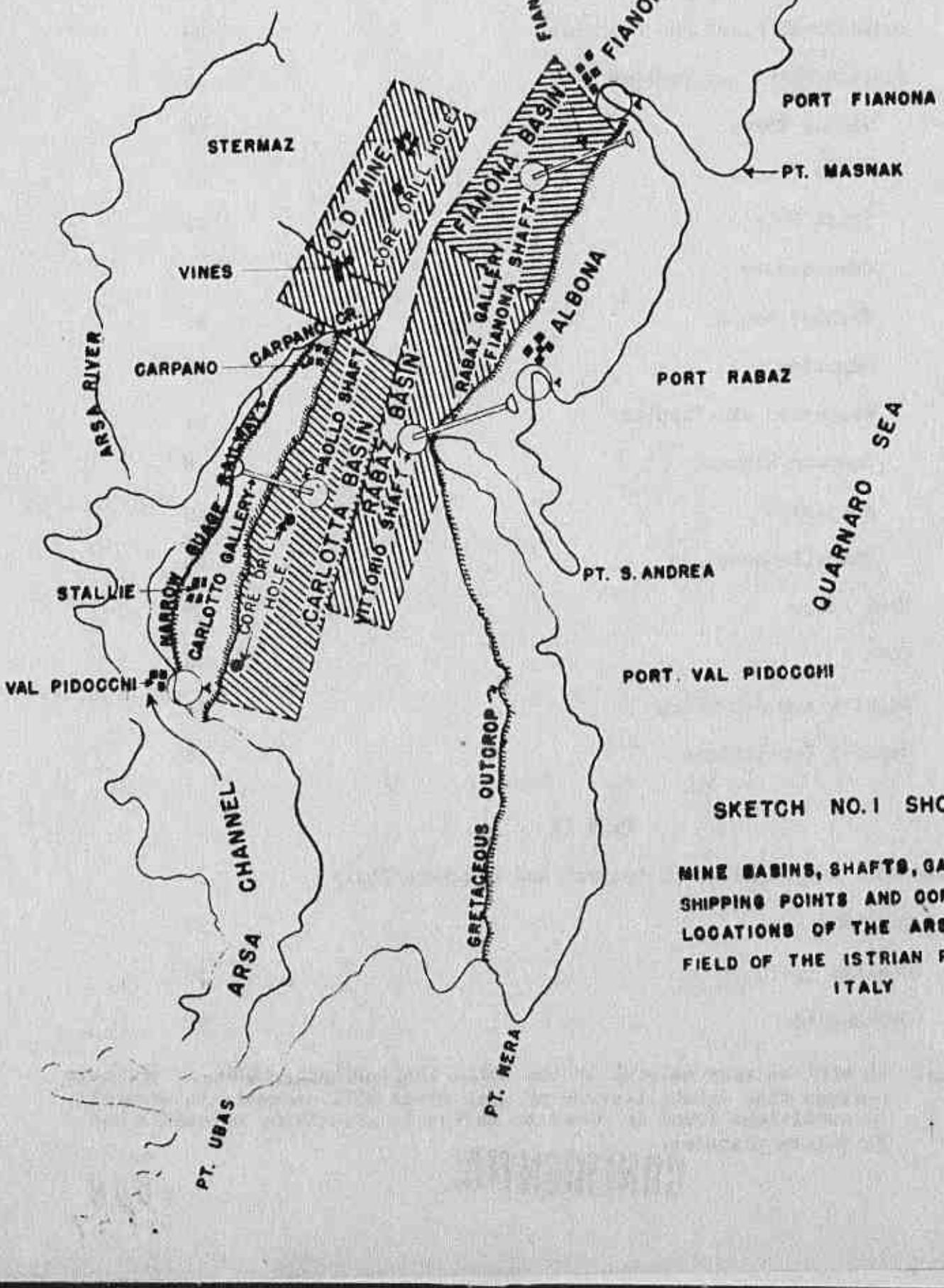

SKETCH NO. 1 SHOWING

MINE BASINS, SHAFTS, GALLERIES, SHIPPING POINTS AND CORE DRILL LOCATIONS OF THE ARSA COAL FIELD OF THE ISTRIAN PENINSULA, ITALY

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SUMMARY AND CONCLUSIONS

ARSA COAL FIELD

PART I

LOCATION AND EXTENT

The Arsa coal field is located on the extreme southeastern tip of the Istrian Peninsula. Istra, previously an Austrian province, was ceded to Italy following World War I. The coal area includes 5,062 acres of actually proven territory. Other adjacent areas may hereafter be proven to contain workable coal.

HISTORY

These mines have been productive for over 150 years. On account of the low melting point of the coal which occurs at about 500° F., Venetian boat builders first began mining it as a substitute for pitch. No substantial development of the area occurred under Austrian control. The Fascist Government of Italy, however, in pursuance of their plan for Italian autarchy, adopted and have executed a very substantial program of research and development. A large reserve of six thick beds of bituminous coal was found by the core drills, and three new, large modern shaft mines have been installed, the active development of which began with the adoption of sanctions against Italy in 1935.

QUANTITY

As of 1938, the coal reserves of the area are estimated to be 247,000,000 metric tons in six workable coal beds each of which is contained in its own rather limited area. These areas are not co-extensive. They are

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found in a bastard formation designated by geologists as The Liburnian Formation which is not known to occur elsewhere in Europe. The Liburnian is a limestone formation lying between the Cretaceous and The Lower Eocene. The coal beds vary from 24 inches up to 15 feet in thickness. They lie on pitches ranging from 20° to 35°. Present production is believed to be in excess of 1,000,000 tons per annum.

QUALITY

The Arsa coals are bituminous in quality. A fair assumption as to chemical analysis is:

Moisture	4.00%
Volatile Combustible Materials	38.00%
Fixed Carbon	38.00%
Ash	12.50%
Sulphur	7.50%
Btu.	11000.

They are non-coking. They are reasonably hard physically, are black and shiny and, on account of the method of mining, produce less than 20% of lump. On account of difficulty in firing, due to low melting point of the coal itself, and a disagreeable odor given off by the ash when wet, they are unpopular with firemen. The Arsa and Sardinian coals are the only bituminous coals so far produced in Italy. Owing to the extremely low grade of the brown coals and lignites of central and southern Italy, the Arsa and Sardinian coals are of great economic value to Italy. The fact that the top and bottom and all partings are of limestone produces an unusual appearance of this coal.

ACCESSIBILITY

The Arsa district is without rail connection but is very conveniently located for ocean carriage. Three large modern vessel loading terminals designed for a combined capacity of 3,000,000 metric tons per annum are

immediately adjacent to the three large shaft mines which are in the process of development. These terminals afford ready access by vessels to ports located on both the East and West Coasts of the Adriatic Sea.

MINING PLANT AND EQUIPMENT

The mining area on Carpano Creek has been practically abandoned save for a series of old shafts and galleries which are maintained to provide access to the new mining areas. The field is naturally divided by Cretaceous dorsals, extending up through the entire Liburnian formation, into three basins, designated Fianona, Rabas and Carlotta. A large new shaft development is being prosecuted in each of these basins. Owing to greater thickness and number of workable coal beds, the Rabaz basin is expected to be the greatest tonnage producer. The Vittorio shaft serving the Rabas basin is over 1,600 feet deep, and was not finished until 1939, for which reason the expected tonnage has not yet been produced. Its projected production is over 1,500,000 tons per annum. The other two shafts, Fianona and Paola are farther along.

SURFACE PLANT

The surface plants include seven mining villages intended to accommodate 10,000 workers. Part of the buildings are very old while the new houses are modern and up to date with running hot and cold water, steam heat, bathrooms, gardens, etc. A special effort has been made to attract Italian labor as against the Slovene and Croate native labor. Three combined washeries and tipples are provided. Each of the washeries for Fianona and Carlotta has a capacity of 3,000 metric tons per 24-hour day; that of Rabas has a capacity of 6,000 tons per 24-hour day. An abundance of power is available from the Government hydro-electric plants in Northern Italy. This is supplemented by local steam "stand by" plants designed to carry the full pumping and lighting

load in case of power interruptions. A large machine shop is maintained at Carpano intended to afford repair services of every kind. It is essential that these mines be self-contained on repair items because of their isolated location. Owing to the extensive use of compressed air, a large central compressor station is maintained at Stallie. The large tipples and washeries combined for these three plants are maintained at Fianona, Albona (or Rabaz) and Stallie on Carpano Creek. Coal is delivered to the terminals from the Stallie tipple by narrow guage (40"), electrified tramway in 6 to 7 ton steel cars. At the dock, cars are elevated by travelling cranes and either unloaded directly into the holds of vessels or on storage piles.

UNDERGROUND PLANT

Because of the location of some of the shafts underground, the maintenance of many miles of galleries and slopes, enormous underground pumping facilities and extensive machine shop facilities, the underground plant is very extensive. The pumping capacity at Paolo shaft totals 242,500 gallons per minute. The pumping layout for the other shafts is not known. A rough inventory of mining equipment as of 1938 is:

15	mine motors
25	mining machines
100	compressed air punching and drilling machines
20,000	feet of shaker conveyors
55	conveyor drives
5,000	steel mine cars of one cubic meter capacity
100	small hoists
20	miles of 40# rail trackage
30	miles of 25# rail trackage
10	miles of 15# rail trackage
8	miles of 8" air line, carrying 90# per square inch
4	miles of 6" air line
7	miles of 4" air line
20	miles of 2" air line
15	miles of water line for sprinkling system.

Many details are, of course, not included in an estimate of this kind. Some of these items are of American or English make, others are German. It is

presumed that inability to secure repair parts has probably put most of the American and English machines out of use and the great bulk of the equipment is now of German make.

VENTILATION

The mines are generally non-gaseous and there are no legal provisions governing ventilation. For this reason natural ventilation plus the compressed air released in mining is very largely relied upon. It is estimated that the men receive substantially 65 cubic feet of air per minute. The coal dust produced is extremely explosive. Owing to the large amount of "shooting from the solid" practised in these mines, an excessive amount of dust is produced. A very extensive and thorough system of sprinkling at the working face is required by law and carefully complied with. The dust from the fourth or Upper Cretaceous seam is believed to be the most explosive.

DRAINAGE

Drainage is, perhaps, the most serious hazard to be overcome in the mining of these coals. The Cretaceous formation is very permeable to moisture and there are many large caverns and subterranean streams of water. These caverns, when pierced discharge vast quantities of water, flooding some areas at times and jeopardizing the lives of the entire work shift. The subterranean passages remain open and after every rain discharge excessive quantities of water. To provide an adequate outlet for all such hazard, the old Clemens Gallery was driven for 4½ miles along the strike of the coal at elevation of 50 meters above tide. As mining advanced, this gallery becomes inadequate and a second connecting gallery, the Alfonso Gallery, was driven at elevation of 45 meters for an additional 2½ miles along the strike to an outlet at the Alfonso portal 7½ miles lower down Carpano Creek than the Clemens portal. These

galleries became inadequate during periods of excessive rainfall and an enormous storage area was worked out with a 36" discharge line into Alfonso Gallery. The capacity of this storage is computed to be 250,000,000 gallons. A discharge of 750,000 gallons per minute has been measured at the Alfonso portal. The Clemens and Alfonso Galleries with the storage reservoir are presumed to afford an effective interceptor drainway for all water originating above elevation 45 meters. It is believed that the same conditions do not exist below sea level as have been encountered above sea level. Attention has already been called to the enormous pumping capacity installed at the Paolo shaft, estimated to be 242,500 gallons per minute. The pumping facilities at the Fianona and Vittorio shafts are not known. Small pilot core drill holes are driven for 50 feet out ahead of all development work, hoping thereby to avoid breaking unexpectedly into water filled caverns. Drainage will continue to be a grave hazard in these mines. Should subterranean passages into the ocean exist and such passages be pierced, there is grave danger that the entire lower areas of the mines will be lost.

PLAN OF MINING

The entire series of six seams is inclined at angles of from 20° to 35°. Each seam has an area of maximum thickness not concentric with the other seams. The four lower seams, the Cretaceous seams, are separated by limestone intervals of only 6 to 10 feet. There is then an interval of from 60 to 200 feet of limestone between the Upper Cretaceous and the Main Seam after which the interval is 20 to 30 feet to the Upper or Top Seam. The plan of mining contemplates working simultaneously all of these seams which are workable in any given area on a modified longwall system. This contemplates backfilling in each seam as the working face advances. This backfilling, of course, in-

volves terrific expense, and, if feasible, a plan should be worked out to avoid this expense. Such a plan will have to be evolved on the ground with all of the many factors to be considered, readily to hand. Long range planning on items of this kind cannot be effective. To an American engineer, considering the very low scale of wages paid, the cost of producing this coal is excessive.

The vertical shafts are sunk, as near as may be, to the center of each basin. Horizontal galleries are driven off the shafts at vertical intervals intended to divide the coal into a series of working areas known as levels. At the intersection of these horizontal galleries with each seam, development entries are driven along the strike from which slopes are driven up the dip to connect with the next higher level. The coal is all gathered at the lower level for hoisting. On the system employed in these mines, the slope distances are 600 feet and the development entries and slope divide the coal into blocks 600 feet square.

In all except the Lower Cretaceous seam, the 600 foot faces are undercut by machines and the coal loaded out in shaker conveyors operating down the dip into mine cars spotted along the entry. These conveyors have a capacity of 25 to 30 tons per hour and do a good job. The backfilling is done from the entry in the upper level with stone delivered to place in conveyors. The stone is carried to place in cars which are dumped by hand from cradles or dumpers. In the thicker coal areas not enough stone is produced to take care of the backfilling and this residue is brought in from old dumps on the outside. Where the seams reach a thickness of from 12 to 15 feet they are mined in two lifts. The Lower Cretaceous, because of its undulating base and great variations in thickness, constitutes an individual and ever changing problem.

It is almost universally "shot from the solid".

LABOR

It is estimated that there are 1,500 families among the old line Istrian miners available to these mines. These people are reported to be rugged, hard working, experienced miners and very satisfactory. At the estimated production of 2,000 pounds or one net ton per day per man, an output of 3,000,000 net tons per year will require approximately 10,000 workers. The difference between this 10,000 and the 1,500 original Istrian miners or 8,500 workers would have to be imported. Competent outside help, including mechanics, clerks, etc., can probably be found, but the coal loaders, about 2,500 of whom will be required, will have to be trained which will be a difficult problem.

The workers are required by law to be unionized into one union, and office workers or salary group into a second union. Strikes are not permitted. Loading per man at the face is estimated to be 5,400 pounds per day. Loading per inside employee is estimated at 2,500 pounds per day and loading per man for all men employed 2,000 pounds per day. Wages range from $0.35 to $1.10 for an 8-hour, portal to portal day. Cost averages $3.00 to $3.50 per metric ton. The mine contract and wage scales are very complicated and based on an entirely different principle than is common practice in U.S.A. It is believed that substantial increases over the above figures, which are based on 1938, have occurred during the war.

BROWN COAL AND LIGNITES

PART II

LOCATION AND EXTENT

The brown coals and lignites of Italy are widely distributed in central and southern Italy. The principal areas occur in Tuscany, Umbria, Campania and Calabria. The deposits do not extend over wide areas.

HISTORY

Owing to their inferior quality and lack of local markets, these coals have never been extensively developed. Under the impetus of World War I, production was increased from about 300,000 tons per annum to 2,000,000 tons per annum. The most attractive sites were selected in order to get this result.

QUANTITY

The total reserves of brown coal, lignite, peaty lignite and peat have been estimated at 415,000,000 metric tons. The number of mines in 1937 is estimated at 43. Production for 1942 has been estimated at 4,000,000 tons. In view of other estimates eminating from Italy, it is thought that this figure may be an exaggeration. Only a very substantial development of processing plants, not justified by the known quality of these coals, could account for such an output.

Typical analysis of the brown coals and lignite of Italy show the following range:

Moisture	12 to 53%
Volatile	20 to 42%
Fixed Carbon	15 to 46%
Ash	6 to 12%
Sulphur	0.7 to 2%
Btu.	9000 to 9900 (Dry Basis)

During the last war it was found that the transportation of these coals to the northern industrial districts consumed more energy units than the coal produced. When dried, it is reduced to a fine dust which if made into briquettes yield a fairly satisfactory domestic and engine fuel coal. Yields of coke, tar, gas and mineral oils under processing are not known. Some development along these lines has undoubtedly taken place.

ACCESSIBILITY

These coals unlike the anthracite and bituminous coals occur in disconnected lenticular shaped masses. The inclination of the deposits range from horizontal to 90 degrees. There are many small drift and slope mines corresponding to our American truck mines. The notable exceptions are the mines at Valdarno and Spoleto in Tuscany and in the vicinity of Tufo, Mercure and Briatico in Southern Italy.

GENERAL CONCLUSION

It is not believed these coals located as they are, remote from important consumers, are of any substantial present economic value to Italy.

THE ARSA COAL FIELD

PART I

INTRODUCTION

The Arsa Coal Field plus the Sardinian Coal Field constitute the only sources of bituminous coal so far developed in Italy. The coals produced in the two districts are somewhat similar in quality. Under the administration of the Azienda Carboneri Italiani, the development of both of these areas was pushed vigorously under the autarchic plan of the Fascist government adopted in 1935. The Arsa, located as it is, at the southern tip of the Istrian Peninsula, is a logical source of supply for the Adriatic Coast and Northern Italy.

Sardinia is likewise, a logical source of supply for the western coast. Italy consumes substantially more coal of this type than the combined projected output of these mines. The coals of Central Italy being low grade lignite and brown coal, the higher grade coals of Arsa and Sardinia are a welcome factor in the Italian economy, and their continued development is of vital importance to Italy.

HISTORY

The development of the Arsa field under Austrian control dates back for approximately 150 years. The seams are exposed on Carpano Creek where mining began. They were small and impoverished, being on the edge of the productive coal area. Austria had an abundance of equally good or better coal elsewhere and only a very small output from the Arsa was developed. After World War I, the Istrian Peninsula was ceded to Italy. When sanctions against Italy were declared in 1935, and the plan for autarchy was adopted, a comprehensive program of research had already been completed by Azienda Carboneri

Italiani including an extensive plan of core drilling which proved an extension of the productive Arsa area. It was discovered that the impoverished seams of the old mine area had increased radically in thickness to the South and East. A very comprehensive plan for development on a major scale was adopted and had reached an advanced stage by 1938. If reports by the Italian government and others on production for later years can be relied on, these mines are now producing in excess of 1,000,000 metric tons per annum as against 150,000 tons in 1929. This in turn indicates that the original plan has continued to be carried out since the production reported could not have been reached in any other way. *

GEOLOGY

The Arsa veins occur in the Liburnian formation. This is a vagrant formation extending for 200 miles across the Istrian Peninsula from the Southeast to the Northwest and is not known to be present anywhere else in Europe. It lies between the Cretaceous and lower Eocene in an elongated lens shaped formation consisting of layers of brown limestone and is known to contain extensive workable coal layers only in the extreme Southeast portion which constitutes the Arsa coal field.

Sketch No. 1 shows the general location of the Arsa field, together with its division into the four working areas shown as the Old Mine area, the Fianona Basin, the Rabaz Basin and the Carlotta Basin.

The approximate location of a main shaft designed to develop each of these areas is shown together with the connecting galleries and shipping points.

* Data from the report of Emanuel Herzog, Director of Research and Development for The Aziendi Carboneri Italiani until the fall of 1938, is used as the basis of this report.

Each will be discussed in more detail later in this report.

The six generally recognized, workable coal seams each develop from a feather edge into an area of workable thickness and then fades out at the other extremity. They are generally thickest at the center but are not superimposed on one another. Each has its own area of thickest development. (See Fig. 1) This, of course, complicates the problem of recovery very greatly.

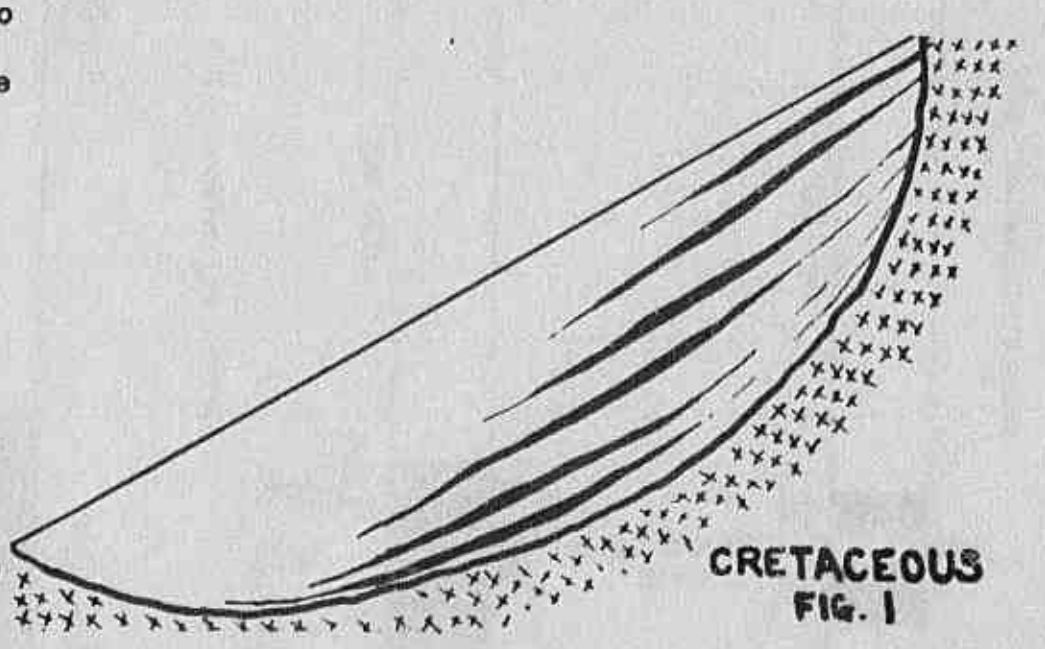


FIG. 1

Fig. 2 shows the typical relative position and detailed thickness of each of the six seams at the core drill locations indicated. It will be noted that each of these seams reach attractive operating propositions.

The field is naturally divided into the basins indicated on Sketch No. 1, by dorsals extending up from the Cretaceous and cutting entirely across the Liburnian formation. Galleries have been driven through and cross connected with slopes thus providing physical, underground connection between all of the areas.

It is estimated there are a total of over one hundred miles of galleries extending through these mines, mostly in the Old Mine area, now practically abandoned. Because of the excellent limestone roof existing

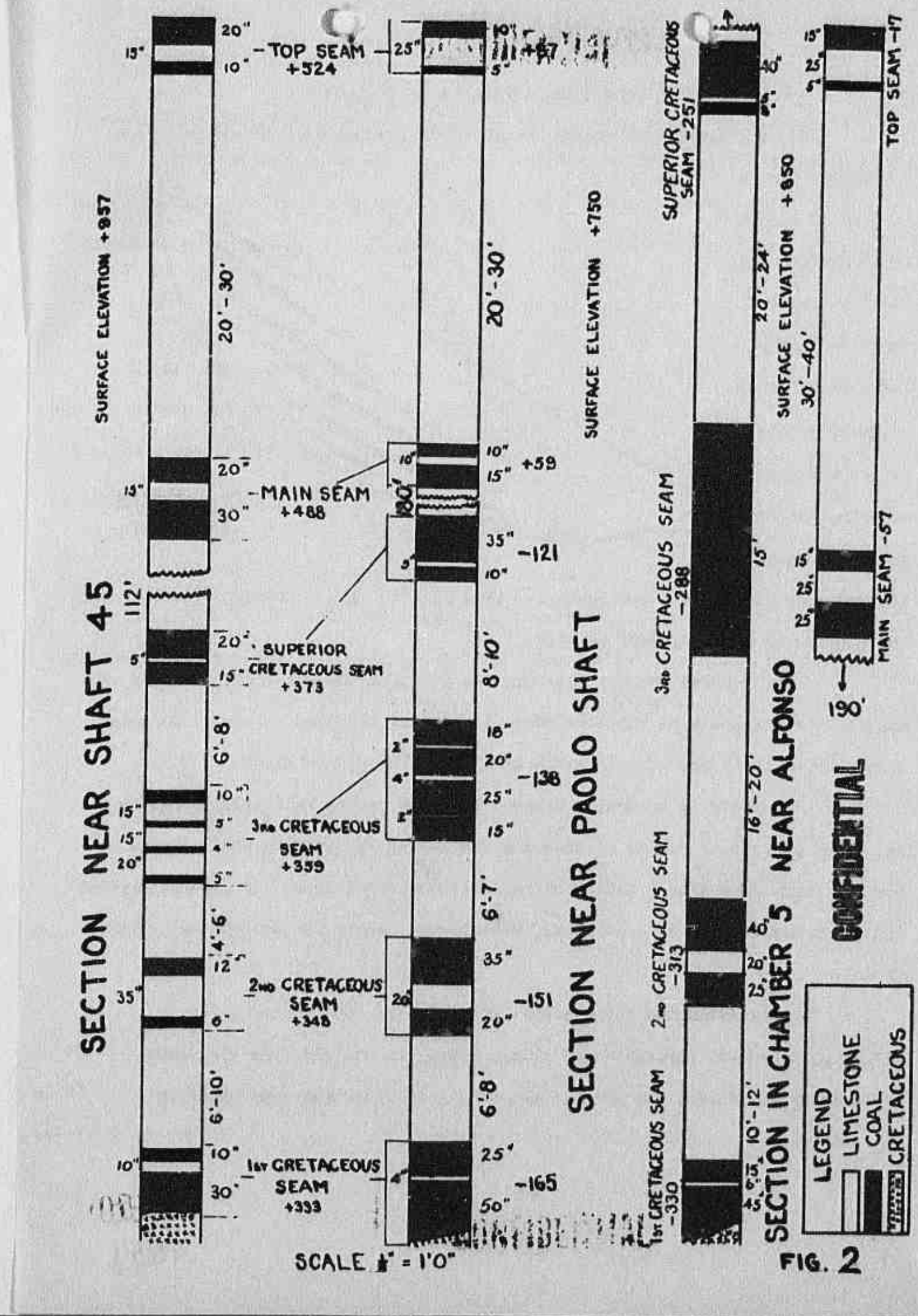


FIG. 2

throughout this entire area, these galleries remain open indefinitely. The old Clemens Gallery was driven over 150 years ago and is still in use.

In order to illustrate the complicated nature of the mining in this field, each of these six seams will be discussed briefly, beginning with the First Cretaceous seam at the base of the formation.

FIRST CRETACEOUS SEAM

This seam is always present in direct contact with the underlying Cretaceous formation, which constitutes an undulating base. The seam thickness varies with these undulations, sometimes reaching excessive thickness while at other points it tapers down to an unminable size. Under these circumstances a consistent plan of mining cannot be followed and great irregularity is therefore characteristic in the mining of the seam. Fig. 3 shows various sections of the seam at scattered locations. Section d is in the vicinity of one of the dorsals where the entire series is cut off. The coal produced from this seam is the highest quality coal coming from this section.

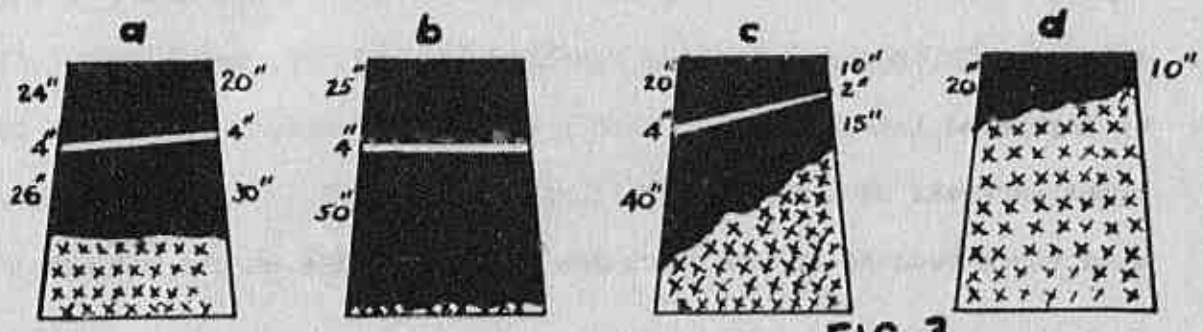


FIG. 3

SECOND CRETACEOUS SEAM

This seam occurs at an interval of from 6 to 9 feet above the First Cretaceous. The interval is limestone. This seam was not a substantial tonnage producer in the old mines where it was virtually abandoned. In the newer areas,

however, it reaches a workable condition and will be a substantial tonnage producer. Figure 4 shows representative sections in inches. Section a is from the old mines where it is not mined. Sections b and c are from the new mine areas now being worked. Section d shows a characteristic section from the Rabat Basin. The coal from this seam resembles that of the First Cretaceous in quality.

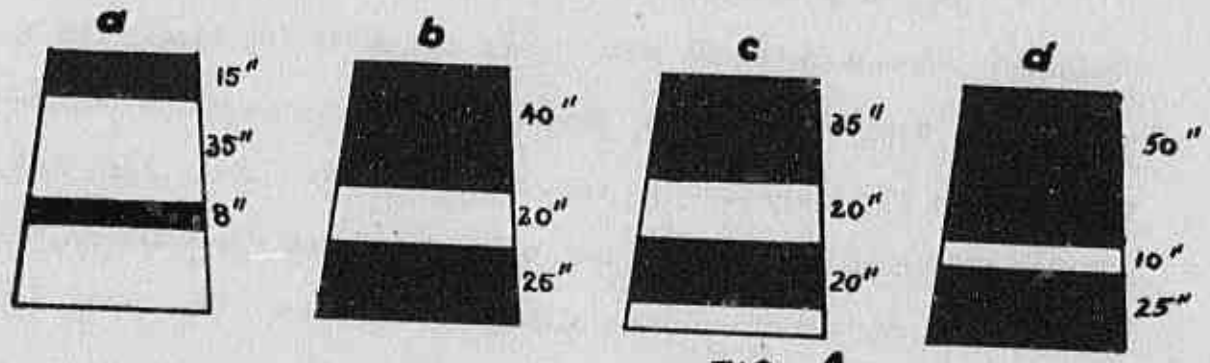


FIG. 4

THIRD CRETACEOUS SEAM

The interval between the Second and Third Cretaceous seams is from 6 to 10 feet of limestone. Like the Second Cretaceous seam, it was too impoverished in the old mines to justify mining. In the new mines, however, it attains a thickness, sometimes reaching 15 feet. Figure 5 shows detail sections at scattered localities. Section a shows its unminable condition in the Old Mines, whereas Section d shows it with 15 feet of thickness in the Carlotta mine where because of its thickness it constitutes an unusual problem in mining.

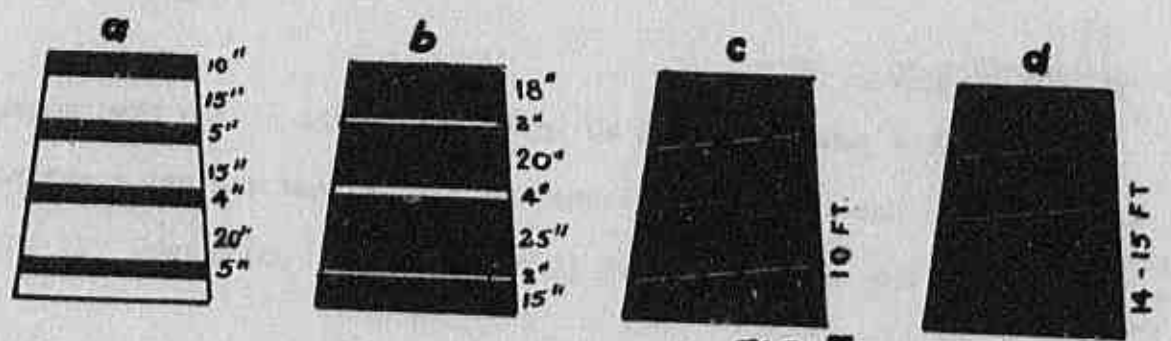


FIG 5

FOURTH (OR SUPERIOR) CRETACEOUS SEAM

This seam is continuous throughout both the old and new zones. In some areas the bottom section of the seam has become too thin for mining and is abandoned. (See Fig. 6)

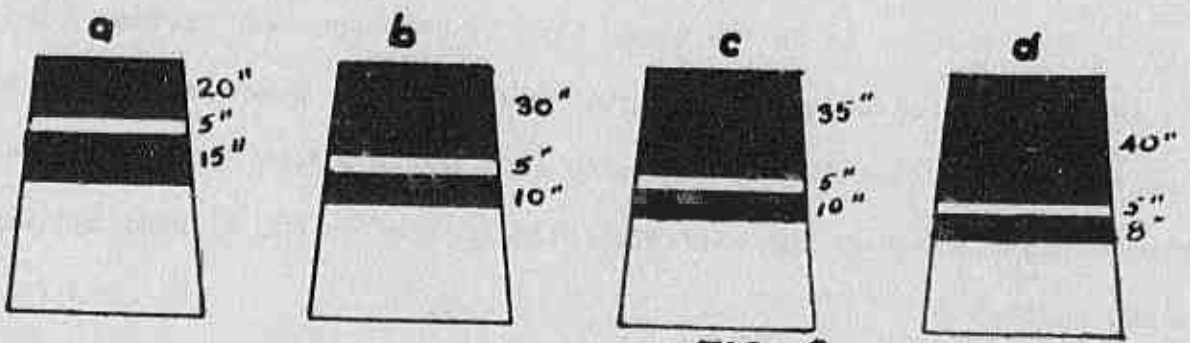


FIG. 6

The interval between it and the underlying Third Cretaceous varies from 6 to 8 feet of limestone. It is characteristic of the Liburnian that limestone constitutes all intervals between seams and that all of the partings in the seams are of limestone.

MAIN SEAM

Between the Main Seam and the Superior Cretaceous, there is an interval of from 60 to 200 feet of limestone. This seam is quite regular over large areas and often reaches a thickness of 5 to 6 feet. Figure 7 shows representative sections. Sections a and b are from the Old Mines where the entire seam is taken. Section c shows it as in the Carlotta basin where

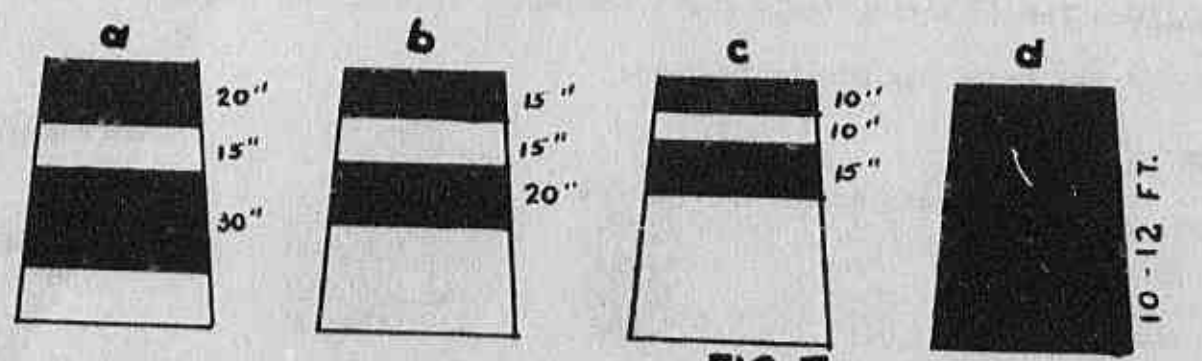


FIG. 7

it is unminable. Section d shows it in the Rabaz basin where it reaches its greatest development.

TOP SEAM

The Top Seam is separated from the Main Seam by a limestone interval, 20 to 30 feet thick. It is the upper seam of the Liburnian series. (See Fig. 8) This seam is only minable in restricted areas and has never been a substantial tonnage producer. Sections a and b are from the Old Mine, c is from the Carlotta basin and d is the characteristic section in the Fianona and Rabaz basins.

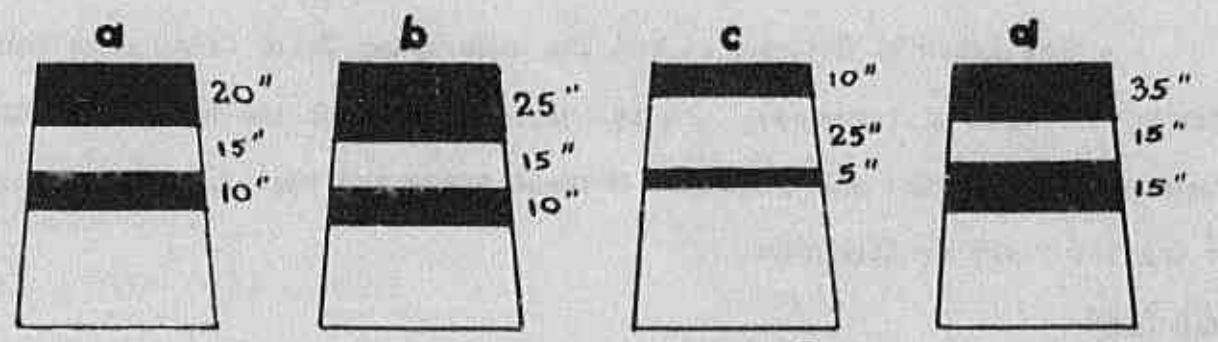


FIG. 8

COAL CONTENT

For the purpose of estimating the "remaining coal reserves", the Old Mine basin is disregarded. The estimated thickness and extent of each seam in the new areas is based upon the core drilling data and other reliable information available. The specific gravity of the Arsa coal is very low being 1.15 to 1.20. The following table shows estimated acreage and tonnage in 1938 for each of the three new mining basins:

Name of Basin	Area		Tons **	Began Mining
	Hectares*	Acres		
Carlotta	675	1,687	76,000,000	1930
Rabaz	650	1,625	130,000,000	Developing in 1938
Fianona	700	1,750	41,000,000	1936
Total	2,025	5,062	247,000,000	

* 1 Hectare = 2 1/2 Acres.

** 1 Metric Ton = 2,205 Pounds.

It is believed that the area lying to the south of these basins is underlain with coal but because of its proximity to the sea and the liability to caverns in the Cretaceous limestone, (see later comment), no attempt has been made to exploit this area.

At Pirano, 20 miles from Trieste, a small basin estimated to contain several million tons of coal was opened by outside capital in 1937 and is presumed to be producing about 100,000 tons per annum. No further data is available regarding this mine.

PRODUCTION

The program of development adopted by the Asienda Carboneri Italiani contemplated an annual output of 3,000,000 metric tons per annum.

The American Consulate General, Genoa, Italy on October 25, 1938, reported from the fifth meeting of the "Commissions Suprema per La Autarchia" held at the Ministry of Corporations in Rome on October 25, 1938, at which meeting Premier Mussolini presided, as follows:

> "In this connection a letter addressed to the Commission by the President of Azienda Carboneri Italiani was read to the assembly which outlined achievements attained in production of the company's mines. It is stated that production in the Arsa mines for the past nine months reached a total of 650,000 tons and will certainly reach 900,000 tons by the end of the year, that is to say an average rate of 80,000 tons per month will have been achieved. At the end of 1939, a further increase is forseen when the "Vittorio Shaft" located on the heights at Albona will have been completed."

Mr. Herzog* considers this statement to be an exaggeration. More recent statements as to production, notably that of Mr. Bruno Luzzatto of the Office of Economic Warfare estimates the 1942 production of the Istrian mines at 1,300,000 metric tons.

It should be noted, however, that the estimates for Sardinian pro-

* Consultant to Solid Fuels Branch on Italian coal mining.

duction were not verified by Lt. Col. Koenig when he reached the Sardinian mines. His initial report placed the maximum production in any one year in Sardinia at 1,041,000 metric tons as against previous estimates of from 1,700,000 to 1,800,000 metric tons. A similar discrepancy in the Arsa production would reduce the above figure to less than 1,000,000 metric tons. Verifying data is not available at the present time.

ANALYTICAL CHARACTERISTICS

The coals of the Arsa district are of distinctive quality in a number of respects. They are very light in weight, specific gravity being from 1.15 to 1.20, as against 1.32 to 1.35 for representative American coals. The coal melts into a tar like mass at 500 degrees F. This creates a problem in combustion and requires light firing to prevent quenching the fire. The stoker feed designed for the Sardinian coal is also effective for this coal. All impurities encountered are limestone, which mixed into the slack, gives it a light grey color. The high sulphur in the coal (7% to 9%) combines with this limestone to form gypsum which drops through the grate bars in the form of fine flaky ash. This chemical reaction prevents ordinary sulphur gas corrosion. If, however, the ashes are sprinkled with water while hot, sulphuretted hydrogen is given off with its disagreeable odor. These characteristics make the coal very unpopular with firemen. Another problem encountered is the high combustion temperature developed which is about 3,300 degrees Fahrenheit.

The fly ash is extremely alkaline and combines with the silicon in ordinary fire bricks to form an easily fusable mass. A fire brick of special composition, therefore, has been developed to overcome this difficulty and is available to consumers.

The average chemical analyses of the various sizes produced are shown

in the following table:

	Selected Lumps	Mine Run	Slack
Moisture	2 to 3%	3 to 5%	5 to 10%
Volatiles	38 to 42%	35 to 40%	30 to 35%
Fixed Carbon	35 to 45%	35 to 40%	30 to 35%
Sulphur	8 to 9%	7 to 8%	6 to 7%
Asn	5 to 10%	8 to 15%	15 to 20%

Heat Value: Btu. 10-12,000 per pound
Fusion Temperature of ash 3,200 degrees F.

Laboratory experiments on processing have yielded negative results. Experimentation on the briquetting of the slack yielded a negative result, with substantial financial losses.

PHYSICAL CHARACTERISTICS

The Arsa coal is black, shiny, comparatively soft and friable and degrades seriously with handling. It does not discolor nor disintergrate with age. The coal from the Cretaceous seams has a conchoidal fracture and is harder than that of the Main and Top seams which cleave rectangularly. Both coals cut and shoot easily, but yield an excessive percentage of highly explosive dust. Shooting from the solid, which is largely practised especially in the lower Cretaceous increases the percentage of slack very materially. Rock dusting as an explosion deterrant has not been successful and sprinkling at the face is required by law.

Screening produces the following size percentages:

Lump (Pezzatura)	over 3"	15 to 25%
Egg (Arancio)	1 to 3"	5 to 10%
Chestnut (Granitello)	1/2 to 1"	10 to 12%
Pea (Noce)	1/3 to 1/2"	5 to 10%
Slack (Polvere)	below 1/4"	35 to 45%

Washeries of the following capacities have been installed:

Stallie	3,000 tons per 24-hour day
Fianona	3,000 tons per 24-hour day
Rabaz	6,000 tons per 24-hour day

These washeries are installed according to the same standard as the washeries at Bacu Abis and Serbariu in Sardinia. The difference between the specific gravity of the coal and the limestone should insure a good separation. Washery residues which are in the form of fine dust yield 9,000 Btu. and are utilized in the steam stand by units in the same manner as in Sardinia.

ACCESSIBILITY TO MARKETS

The mines of the Arsa district are unique in that they have no railway connection to neighboring markets. They do have splendid sea outlets however and the coal can be loaded direct into the holds of ocean going vessels. There is a general market at Adriatic ports and along the east coast of Italy for more of this character of coal than these mines can produce.

The percentage previously shipped to various ports with the ocean mileage involved, is shown in the following table:

Destination	Mileage	Percentage
Fiume	45	5
Pola	30	5 to 10 (Mainly for Navy)
Trieste	120	5 to 10
Venice (Chioggia)	130	40 to 50 (Inland trade)
Bari	380	5 to 10
Ancona	130	10 to 20

Three modern well equipped loading ports are provided (See Sketch No. 1) which are as follows:

(1) Val Pedocchia located in the Arsa channel 6 miles from the Adriatic Sea. This harbor is land locked and permits cargo loading in all types of weather. The channels are deep and will accommodate

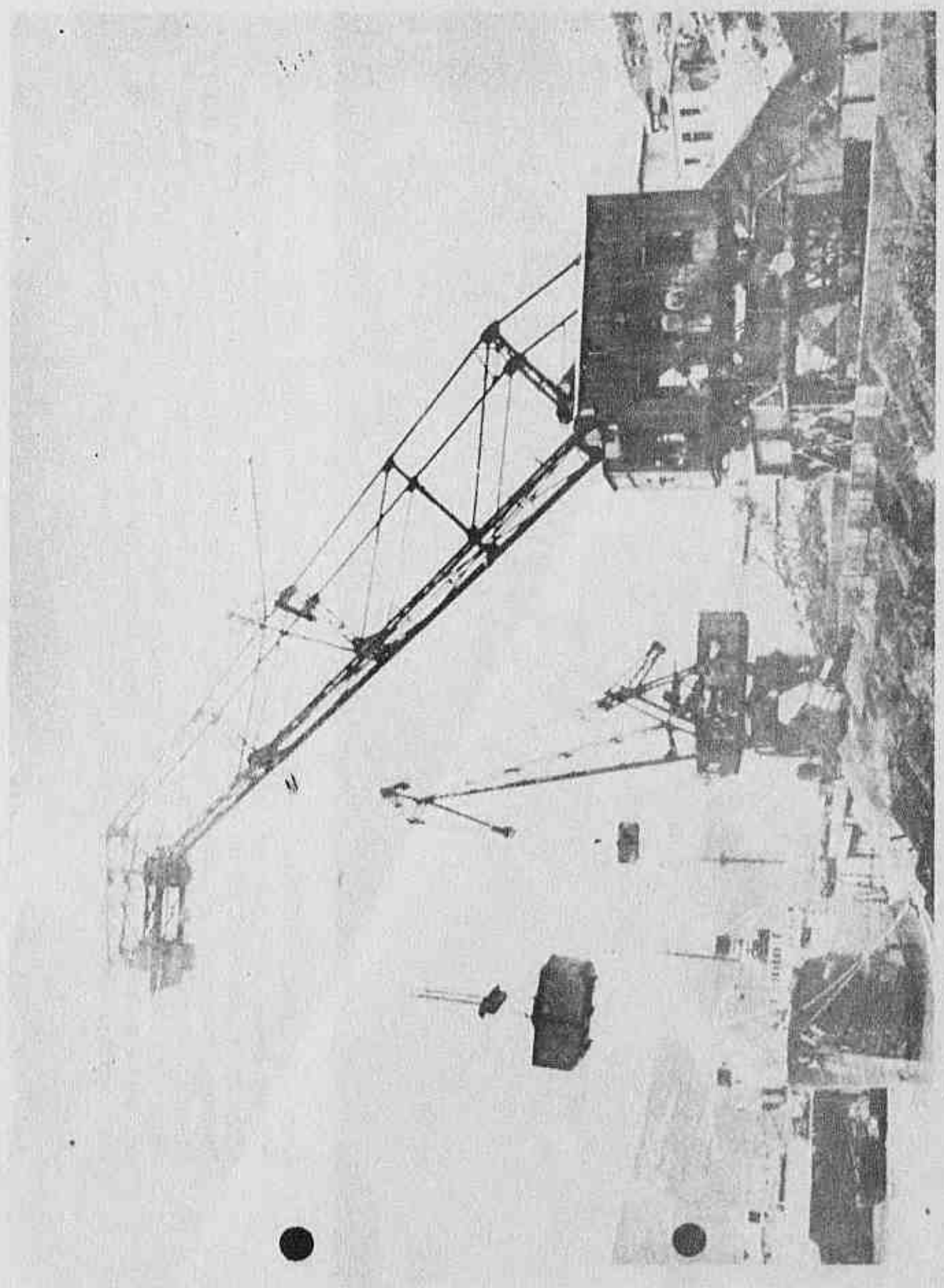
any type of ocean going vessels. Coal is delivered to the terminal over a 40" gauge, electrified tramway 1/2 mile long, extending from the tipple and washery at Stallie. The coal comes into this terminal in 6 to 7 ton cars which are picked up bodily by travelling cranes and dumped either directly into the hold of vessels standing alongside or onto storage piles. The storage capacity at the docks is 10,000 tons but is supplemented by additional storage space at the washery, giving a total capacity of 1,000,000 tons per annum. The accompanying pictures of this installation are furnished by Photographic Intelligence. Full aerial photographic coverage has been secured, is being processed and will be available at an early date. The Carlotta mine delivering to this terminal is designed for a capacity of 3,000 tons per day or 900,000 tons per year.

(2) The harbor of Rabaz is located in a small cove on the Quarnaro Sea near the town of Albona. It is not a good natural harbor but is presumed to have been greatly improved by the government in order to utilize it as the loading port for the Rabaz Basin mine which is expected to be the greatest tonnage producer of any of the three new mines. The coal is intended to be delivered via Rabaz Gallery direct to the tipple and washery from the Vittorio shaft. This washery is designed for 6,000 metric tons per 24-hour day and coal will be delivered direct to the vessels or storage piles from the Washery without an intervening haul. This mine is designed for a capacity of 6,000 metric tons per day or 1,800,000 metric tons per year.

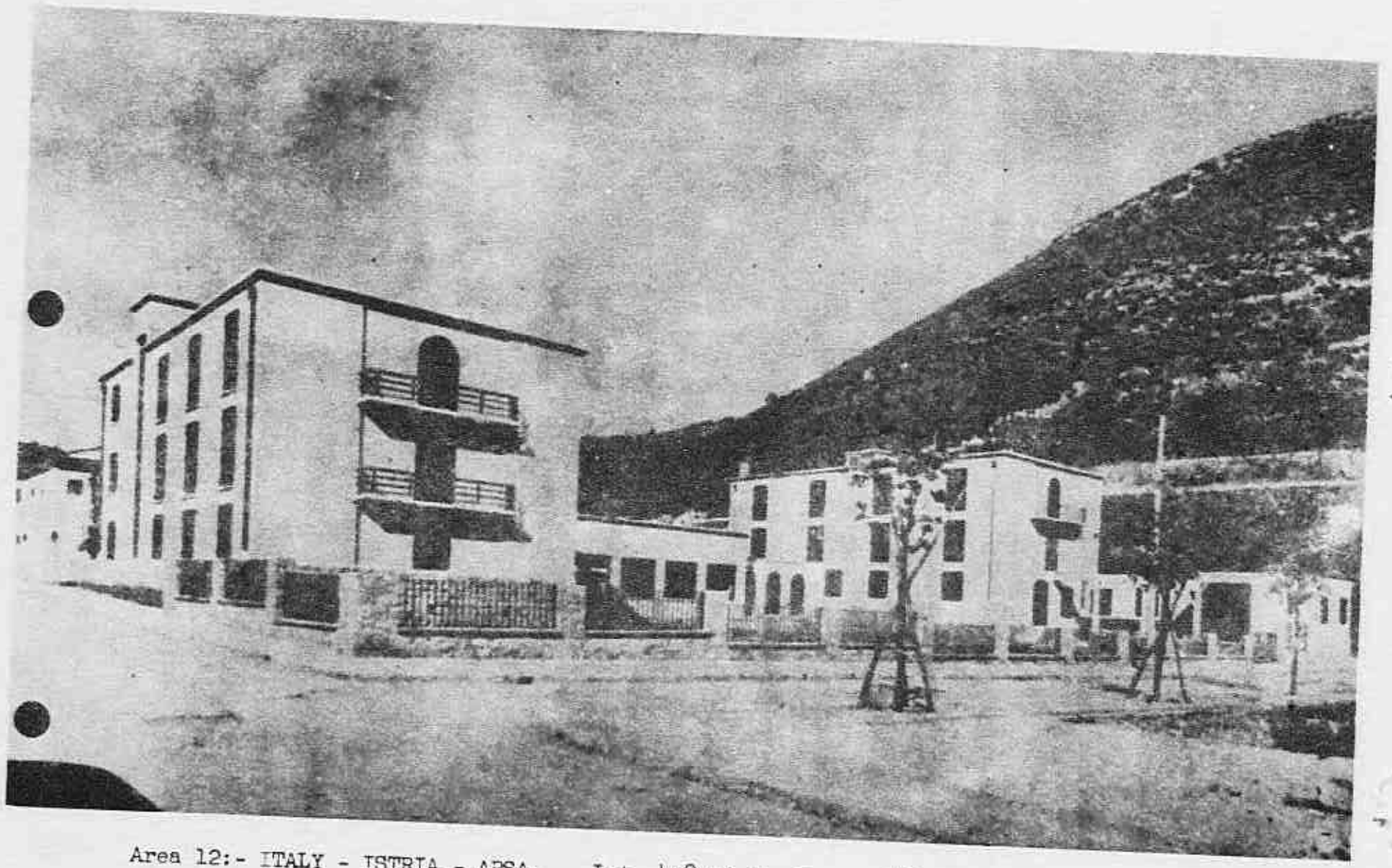
(3) The harbor at Fianona is located at the end of a long, deep,

well protected bay. It is located in the immediate vicinity of the Fianona Shaft. The Washery has a capacity of 3,000 metric tons per 24-hour day and the loading capacity of the terminal is 1,000,000 metric tons per annum. (The new Rabac, Fianona, and San Antiocco terminal, in Sardinia, are all of the same standard design.)

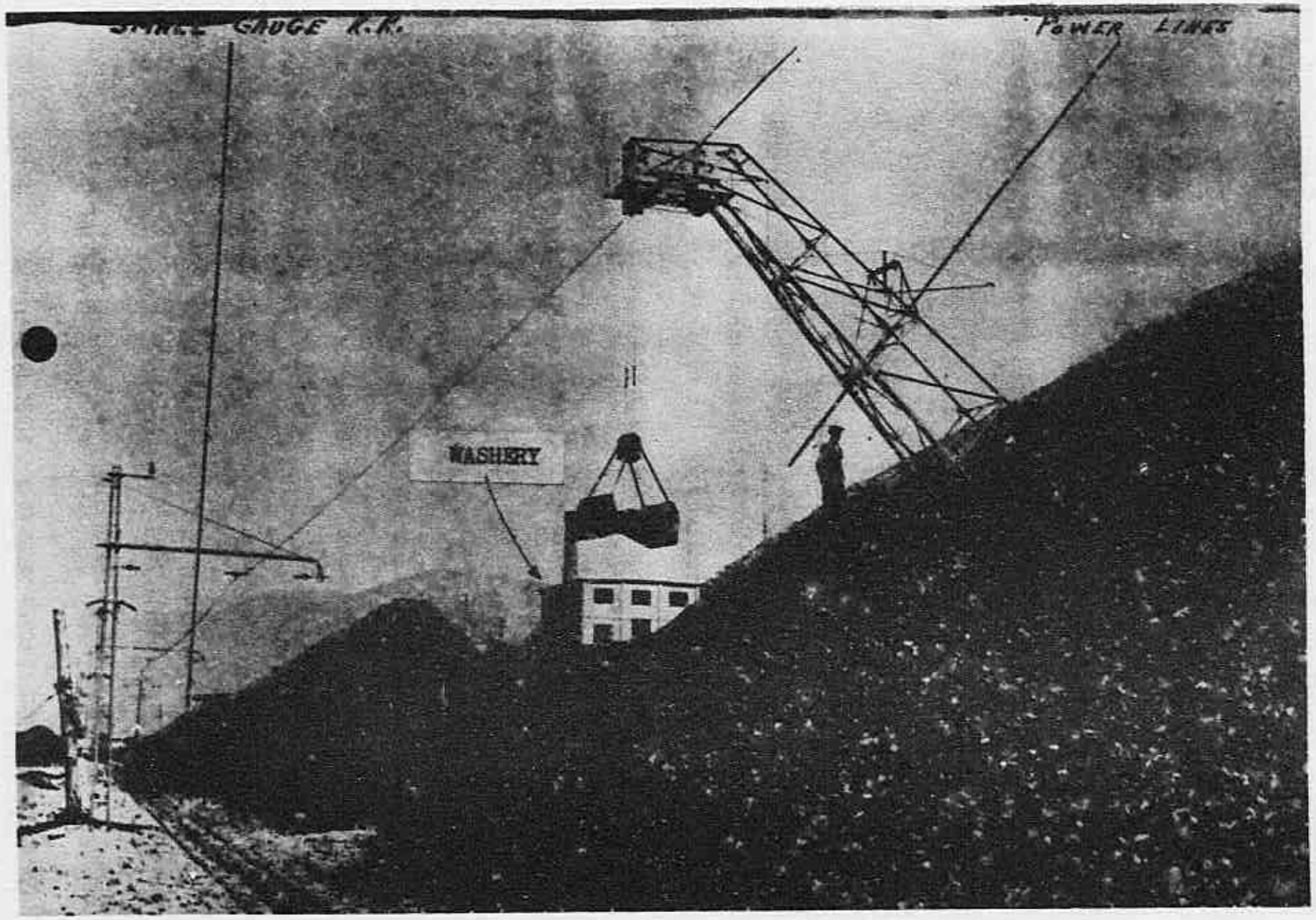
These three harbors serving the Arsa mines are intended to provide a comfortable loading capacity in excess of 3,000,000 metric tons per annum.



AREA 12: ITALY - ISTRIA - ARSA CANAL: Lat. 45°0' N., Long. 14°5' E.G.
View N.N.W. of coal loading point on Arsa Channel near Bergodaz (Rupa Cove). Channel 6 miles long, ½ mile wide, navigable to Bergodaz. Small gauge RR carries coal mined in Carpano Valley to Bergodaz. L'Azienda Carboni Italiani (A. Ca. I.) organized 1935 by Fascista to develop these mines and mines at Bacu Abis (Carbonia), Sardinia. Big problem in Arsa area is rough terrain and depth at which coal is found. Total production of all A. Ca. I. mines about 1,000,000 tons annually. About 300,000 tons mined at Arsa, balance in Sardinia. Workers' homes, phone and rail lines built at Arsa in 1936.



Area 12:- ITALY - ISTRIA - ARSA. Lat. 45° 0' N., Long. 14° 5' E.G.
View of homes for unmarried coal mine workers. Fascists organized Azienda Carboni d'Italia (A.Ca.I.) 1935 to develope coal mines of Carpano Valley, north of Arsa Channel, and mines of Bacu Abis (Carbonia), Sardinia. Workers' homes, phone and rail lines built at Arsa 1936. Coal mined here is carried by small guage RR to Bergodaz (Rupa Cove) on Arsa Channel for shipment. Big problem in Arsa area is rough terrain and depth at which coal is found. Total production all A.Ca.I. mines about 1,000,000 tons yearly. 300,000 tons (approx.) produced at Arsa, balance in Sardinia.



ARKA 12: ITALY - ISTRIA - ARSA CANAL: Lat. 45°0' N., Long. 14°5' E.G.
View N.E. of coal dump. Power lines in background. Coal loading takes place at Bergodaz (Rupa Cove) on north bank of Arsa Channel, which is navigable to that point. Small gauge RR carries coal mined in Carpano Valley to shipping point. L'Azienda Carboni Italiani (A. Ca. I.) organized 1935 to develop these mines and the mines of Bacu Abis (Carbonia), Sardinia. Big problem in Arsa area is rough terrain and depth at which coal is found. Total production all A. Ca. I. mines about 1,000,000 tons annually. Approximately 300,000 tons produced at Arsa, balance in Sardinia. Workers homes, phone and rail lines built at Arsa in 1936.

MINES AND MINING

The underground layout of these mines is very much complicated by the old mining which has progressed for 150 years in this area. This old work has been abandoned and is now believed to be standing idle, although mining can be resumed at any time. In order to take full advantage of the old mines, much of the old work is being maintained. Owing to the hard, durable limestone measures in which these mines occur, little or no maintainance difficulty is encountered.

The most notable of these old items are the old shafts, Nos. 68, No. 45, Joseph, Franz and Clemens (or Good Luck) and the Clemens, Carlotta and Alfonso galleries. These shafts and galleries are not used for hoisting and haulage but assist in ventilation, drainage and for handling men and supplies. Figure 9, drawn from memory by Mr. Herzog*, indicates rather crudely and not to scale the relative position of these and various other items. Until accurate mine maps are available, a clearer picture of this situation cannot be presented.

Of very great importance is the old Clemens gallery which has been in use for 150 years and is still in perfect condition as haulage and drainage entry. It is 4½ miles long, driven on the strike at about elevation +50 meters and connects by means of slopes with all of the old and new mining areas and shafts as well as with the old Alphonso drainage gallery at elevation +10 meters which gallery is 2½ miles long. These two galleries extend along the strike for a total distance of 7 miles and are of tremendous value as interceptor drainage galleries between the upper and lower levels in mining. Combined, they constitute a continuous, underground connection between all of the new

* Temporary consultant, Solid Fuels Branch.

CONFIDENTIAL

SCALE:- 1 - 50,000

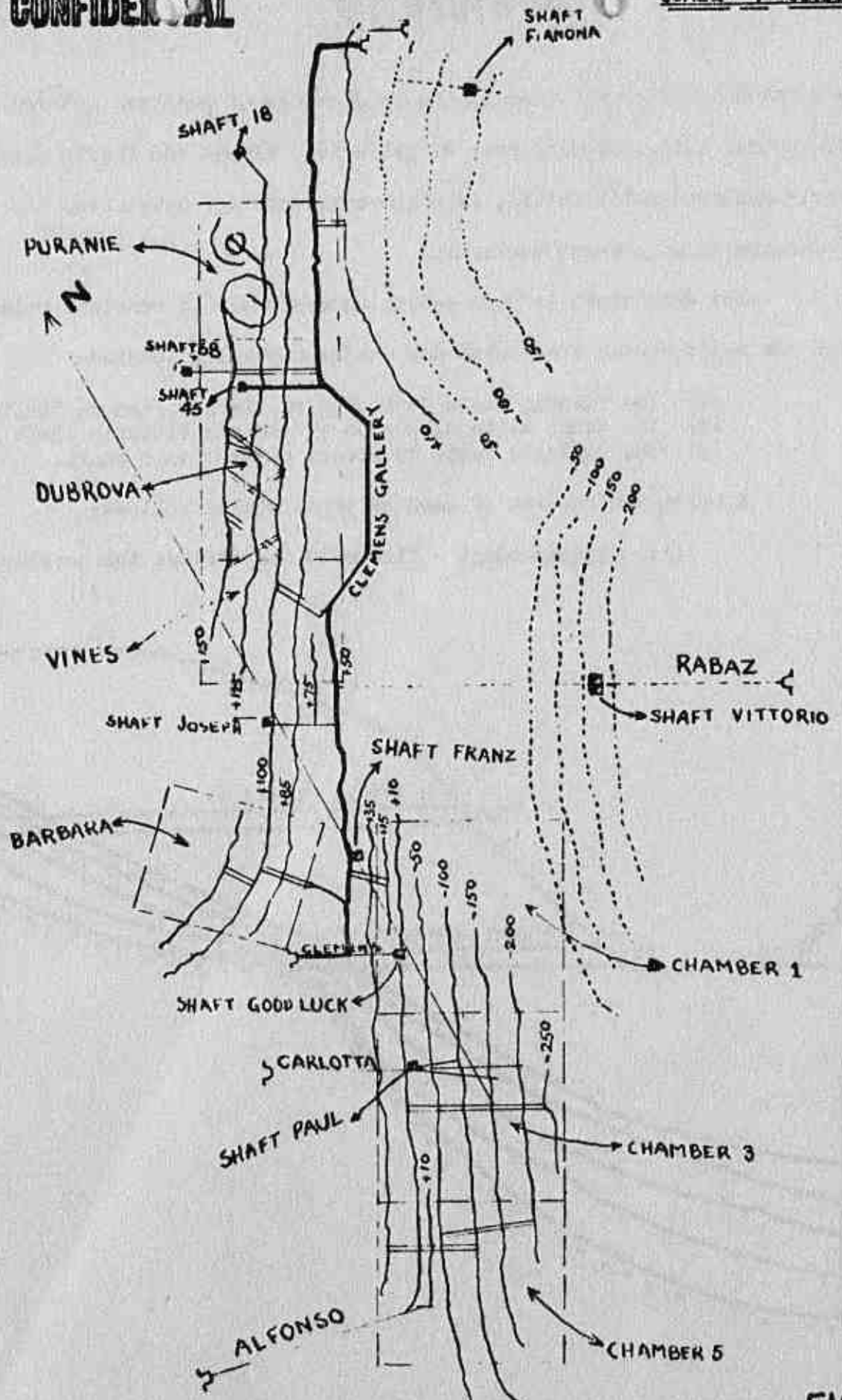


FIG. 9

GENERAL MINE MAP - ARSA VALLEY

THIS SKETCH MADE FROM MEMORY BY EMANUEL HERZOG

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mines which is of great value in the interchange of supplies and men. As noted above, this confusing maze of galleries, slopes and shafts cannot be clearly analysed until actual, accurate mine maps are available. No other information is at present available.

The new layout is more easily understood. It consists primarily of three new major mining areas with new shafts centrally located:

(1) The Fianona Basin developed by the new Fianona Shaft,
(2) The Rabaz Basin developed by the new Vittorio Shaft and
(3) The Carlotta Basin developed by the Paolo Shaft.

A brief description of each of these shafts follows:

(1) Fianona Shaft - Figure 10 illustrates the location of the

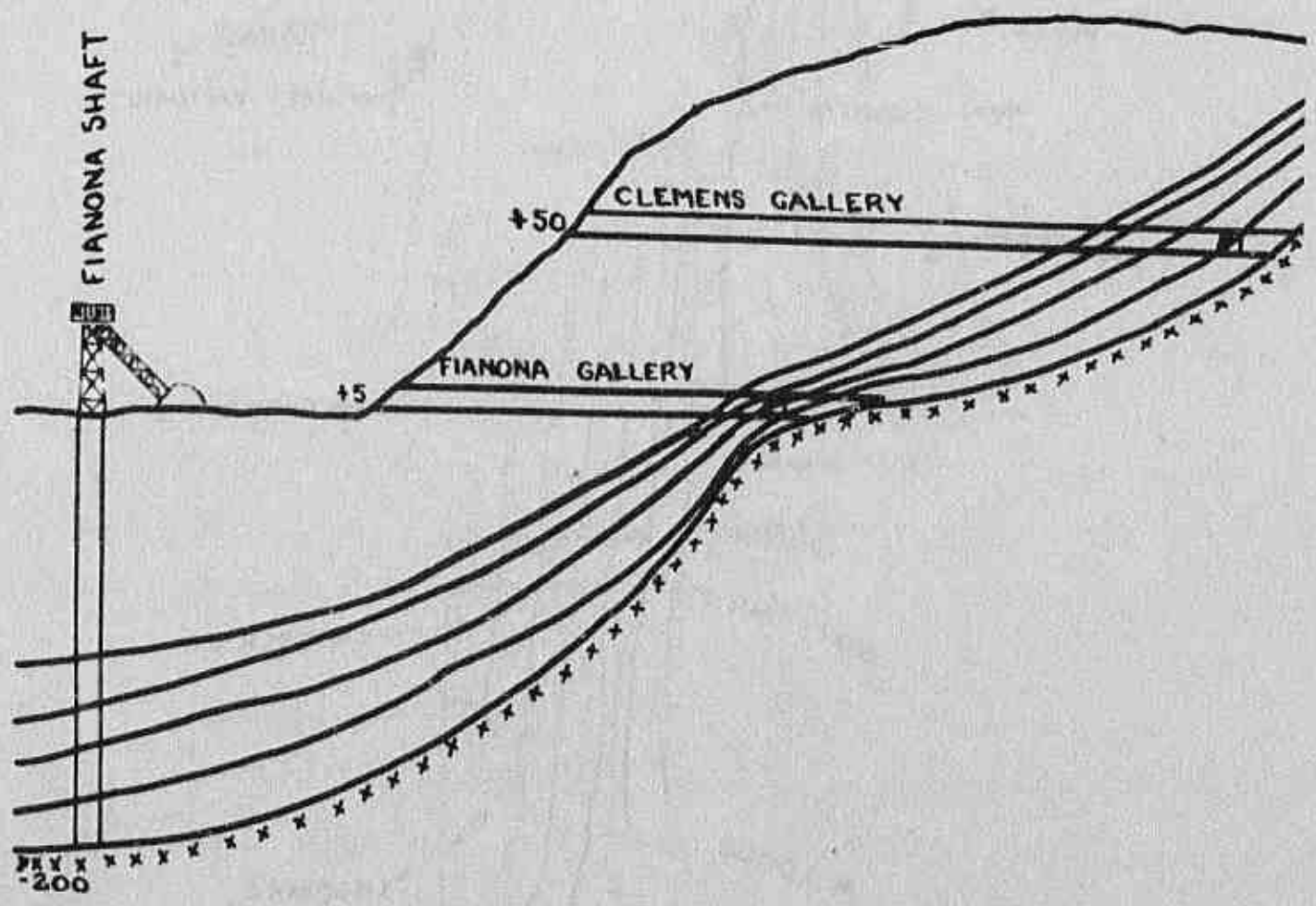
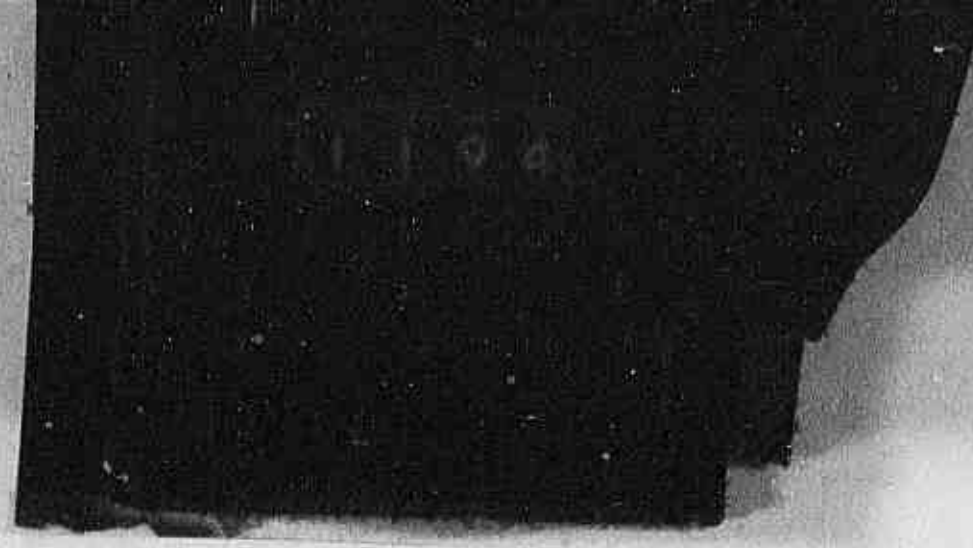


FIG. 10



Fianona shaft with reference to the Clemens and Fianona galleries. This is a standard shaft 8' x 12', 200 meters (656.2') deep. Horizontal traverse galleries, called "galleries in stone" will be driven off from this shaft at projected intervals to intersect the series of coal seams as indicated in the sketch. Strike entries called "development entries" will then be driven from the intersection of these traverse galleries with each of the seams and mining developed in each seam from these development entries. The different levels are connected by slopes and all coal is collected in the traverse gallery for hoisting in the shaft. Fianona shaft is designed for a capacity of 1,000 tons per day. Fianona gallery starts at an elevation of +5 meters and extends for ½ mile to intersection with the coal seams. The portal to this gallery is ½ mile from the shaft. Clemens gallery at +50 meters connects with the old mine workings as well as other mines.

(2) Vittorio Shaft - Figure 11 shows the Vittorio shaft in relation to Rabac gallery, Clemens gallery and the surface. The upper part of the shaft serves for handling men in and out of the mine from Albona. Hoisting of the coal is completed at the Rabac gallery through which it is delivered to the outside at the port of Rabac. This shaft extends from the surface at elevation +200 meters in order to provide for lowering men from Albona and extends down 450 meters (1,466.5 ft.). It is of the same standard dimensions as the Serbariu shafts in Sardinia, that is, 5 meters (16.4 ft) in diameter and is equipped to hoist 3,000 metric tons per day on a two-shift basis. This shaft is connected on the inside with the Rabac

terminal by means of the Rabaz gallery from one to one and a half

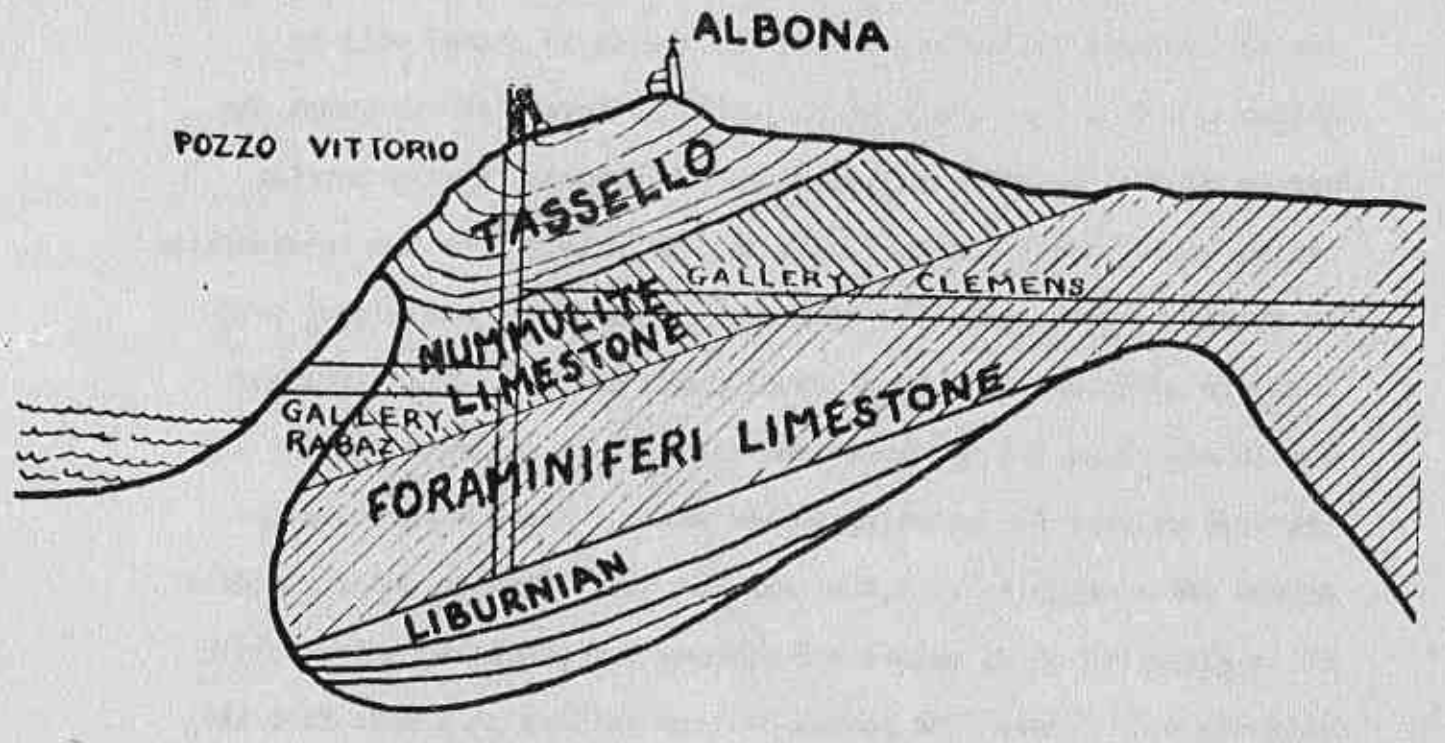


FIG. 11

miles long. It is believed that this gallery will be extended inland beyond the shaft to intersect with the coal seams at the higher levels although a comparatively small tonnage of coal remains in these higher levels. The coal seams reach their maximum thickness in the Rabaz basin and the Vittorio shaft is, therefore, expected to become the greatest tonnage producer in the Arsa field. The shaft was approaching completion in October 1938 as stated in the meeting of the "Commissions Suprema per La Autarchia". Further data as to the subsequent development in this basin are not available.

(3) Paolo Shaft - Figure 12 shows the Paolo shaft located on Carlotta gallery at the approximate center of the Carlotta basin. This shaft sunk inside the mines is typical of others throughout this

district. It is standard 8' x 12' size and is equipped to hoist 1,000 tons per 8-hour shift. It extends from elevation -38 meters to a depth of 288 meters (944.9 ft.). Men and material are not to be handled through this shaft since neighboring slopes and shafts are available to and from the -38 level. The hoist room and galleries to carry the ropes and drums are all excavated from solid rock. Carlotta gallery extends for one mile from this shaft to the outside and thence for another 3½ miles by 24" gauge, electrified outside tram to the tipple and washery at Stallie.

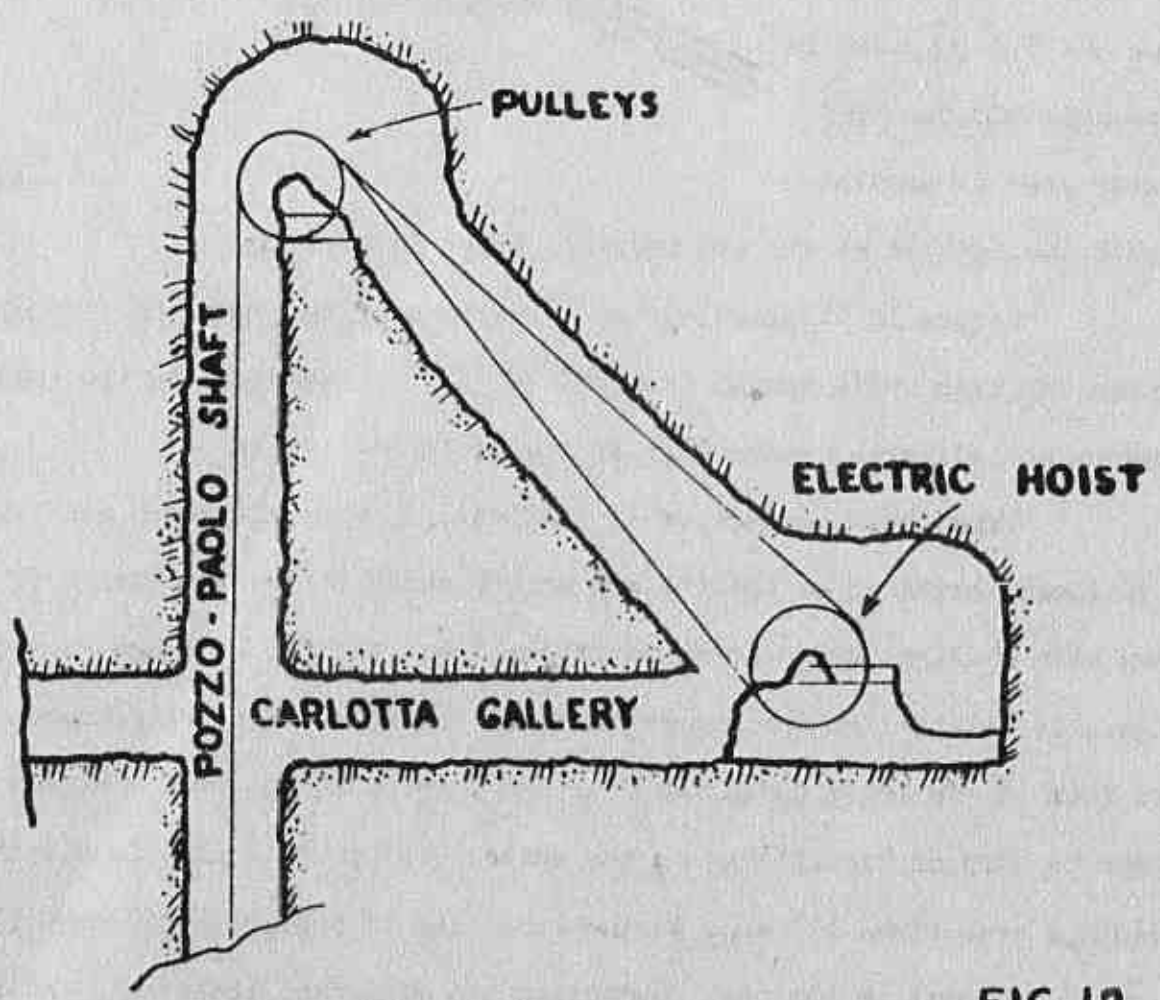


FIG. 12

PLAN OF MINING

Figure 13 illustrates the manner in which the horizontal traverse galleries or "galleries in stone" are driven to intersection with the various coal seams. The distance between levels along the seams is intended to divide the seams into suitable areas for mining. This is known as the dip distance. For the modified longwall mining method in use in the new mines at Arsa the dip distance is generally 600 ft. The system used is substantially the same as at the new Serbariu mines in Sardinia.

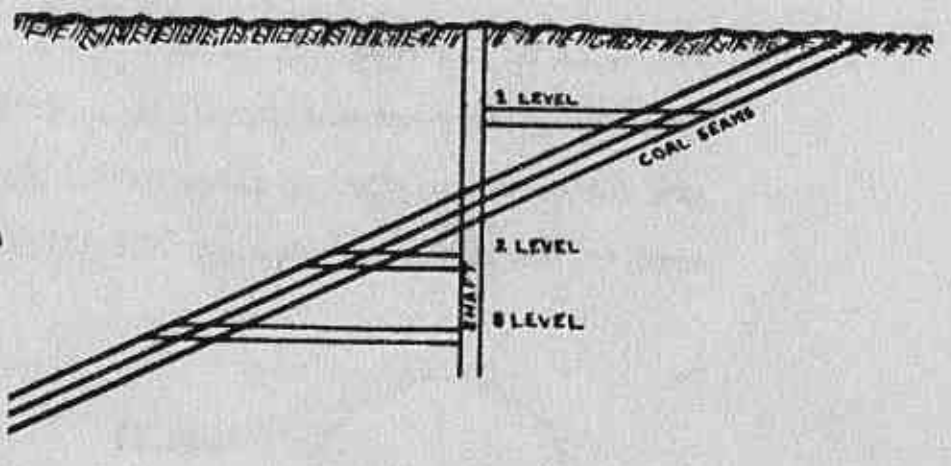


FIG. 13

Figure 14 illustrates the occurrence of the seams and the continuous change in pitch which varies from 20° to 35°. These dips and the intervals between the different seams vary at the different levels.

From the intersection of the traverse galleries with each seam, development headings or entries are driven which follow the strike of the seam with a slight grade in favor of the loads and for drainage purposes. Figure 15 illustrates the manner in which these headings are driven. They are from 15' to 16' wide in the coal and 7' wide in the bottom stone. The stone is used as backfilling in the space left by the coal. Double track headings are driven 11' wide in the stone and triple track headings 15' wide.

Slopes in the coal connecting the different levels are driven every 600', thus dividing the coal into blocks 600' x 600'. These slopes are driven

20' to 24' wide and no bottom is taken.

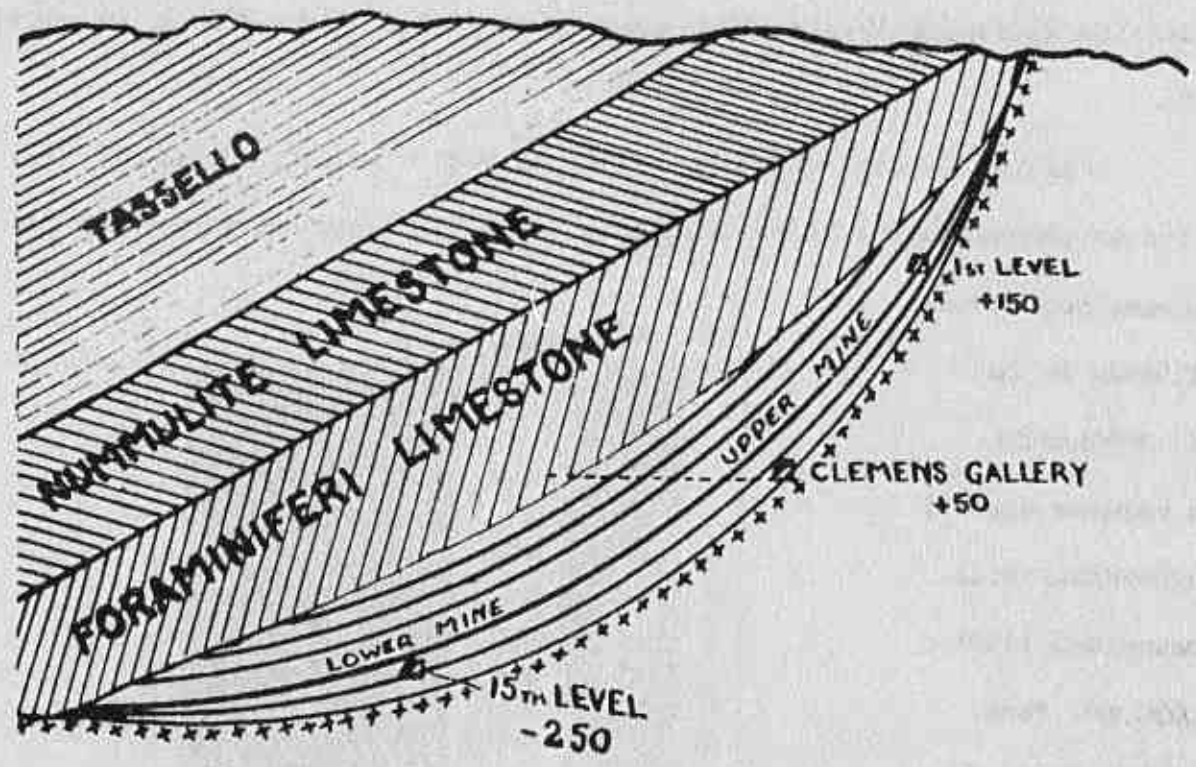


FIG. 14

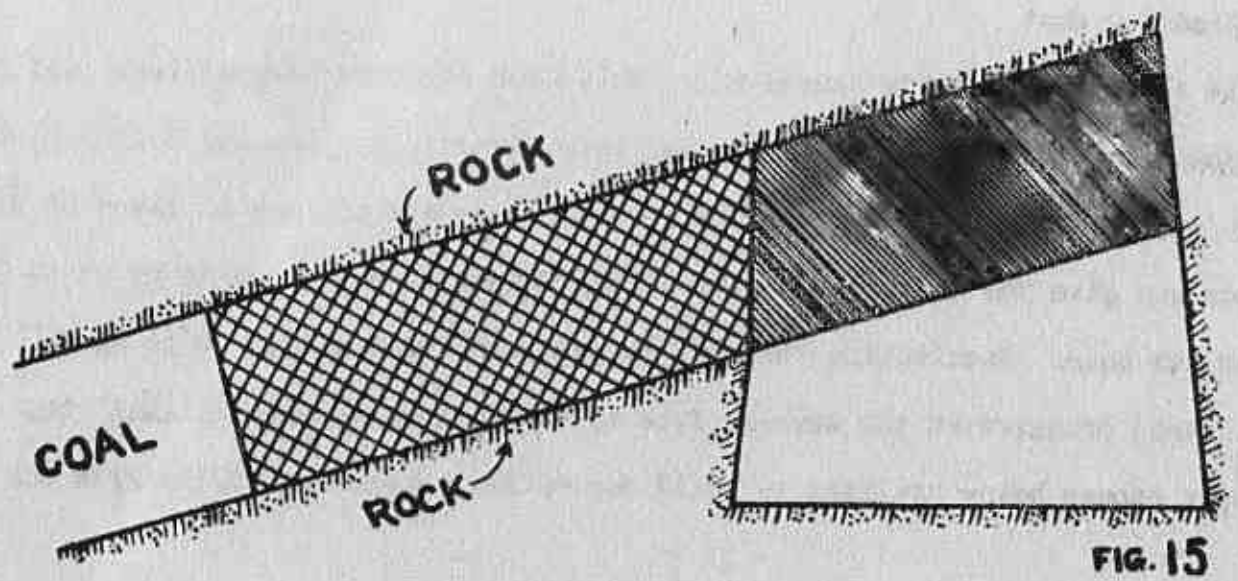


FIG. 15

Slope headings or entries are driven at convenient intervals 7' x 11' to provide for two tracks, on which coal can be raised or lowered between the different levels, they are equipped with 10 to 20 h.p. electric hoists.

Figure 16 illustrates the usual method of mining the coal. (Excessive thickness in the third cretaceous seam and extreme variations in thickness and bottom conditions in the first cretaceous seam require special methods which will be described later.) The 600 ft. face along the slope is divided into two sections, one of which is being machine undercut, drilled and shot while the other is being loaded out. This face advances progressively 600 ft. to the next slope. The coal is loaded into shaker conveyors and delivered to cars standing along the entry. The grades due to the dip are in favor of the loads and give the shaker conveyors a large capacity estimated to be 25 to 30 tons per hour. Backfilling follows the advancing face within 30 to 35 ft. All stone produced at the working face is thrown into the backfilling, the larger stones being utilized to build dry walls. Space not filled from the

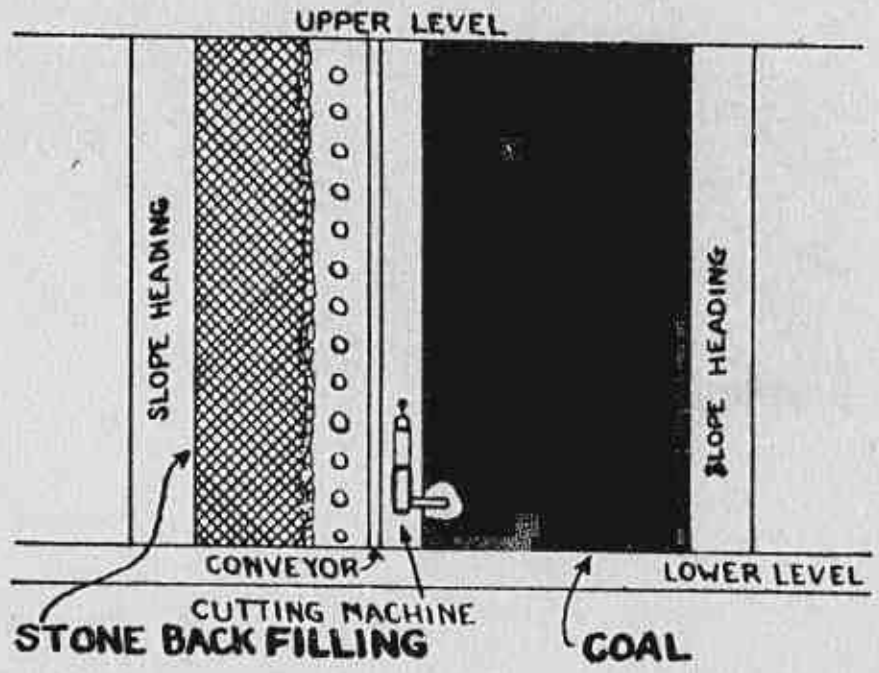
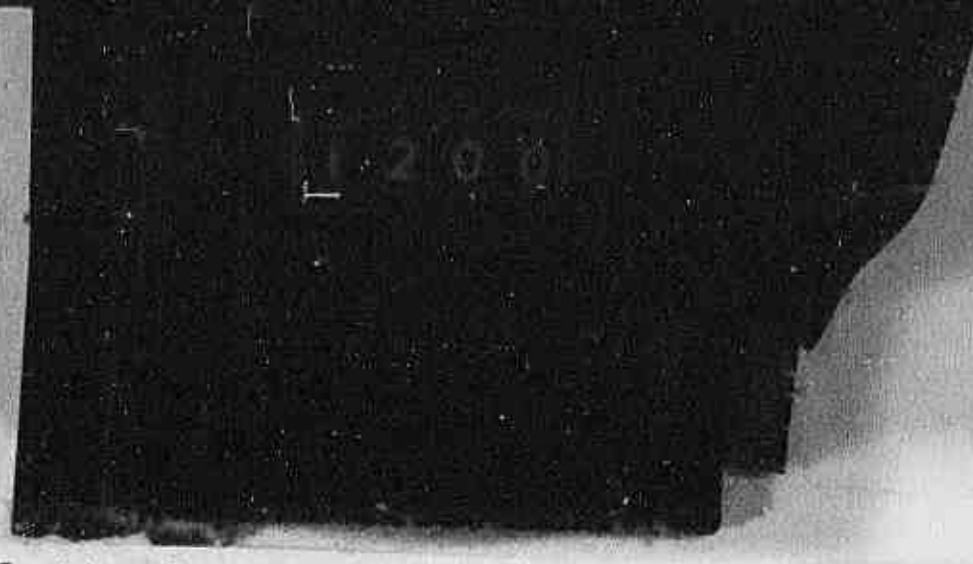


FIG.16



working face is filled by stone hauled in from the outside and put in place by a backfilling crew. This stone arrives on the upper level in dump cars and is conveyed to place by conveyors. The new mines with greater seam thickness do not produce enough stone to provide backfilling and old spoil dumps on the outside are being used for this purpose. Owing to the good top conditions very little timbering is required.

The cutting on the longwall face is done with chain cutting machines. One crew is expected to cut, drill and shoot one 300 ft. face per shift while the loading crew is loading out the remaining 300 ft. face. The entry driving is done very largely with air drills which are more effective in rock than electric drills. Each entry crew is expected to advance from 3 to 4 feet per shift.

A brief discussion of the mining in each seam follows:

(1) As noted above, mining in the first cretaceous seam presents a special problem. The seam is very irregular in thickness and extent with irregular bottom which precludes the use of cutting machines and conveyors. In general mining this seam resembles ore mining rather than coal mining. Figure 17 illustrates one of the conditions encountered in this seam. On account of excessive grade the slopes were driven on a diagonal. The mining of the seam develops out from these slopes. Cretaceous dorsals intersect the seam at various intervals and serve as roof supports. In the center of its area the seam often reaches 7 ft. in thickness, but is sometimes divided by limestone partings. Figure 18 illustrates another condition sometimes encountered in the mining of this seam.

"Shooting from the solid" is the usual method used. The consumption of explosives is quite large. The coal itself is somewhat

higher grade than the other seams and the lump coal is preferred as "house coal" by the employees. The drilling is done by compressed

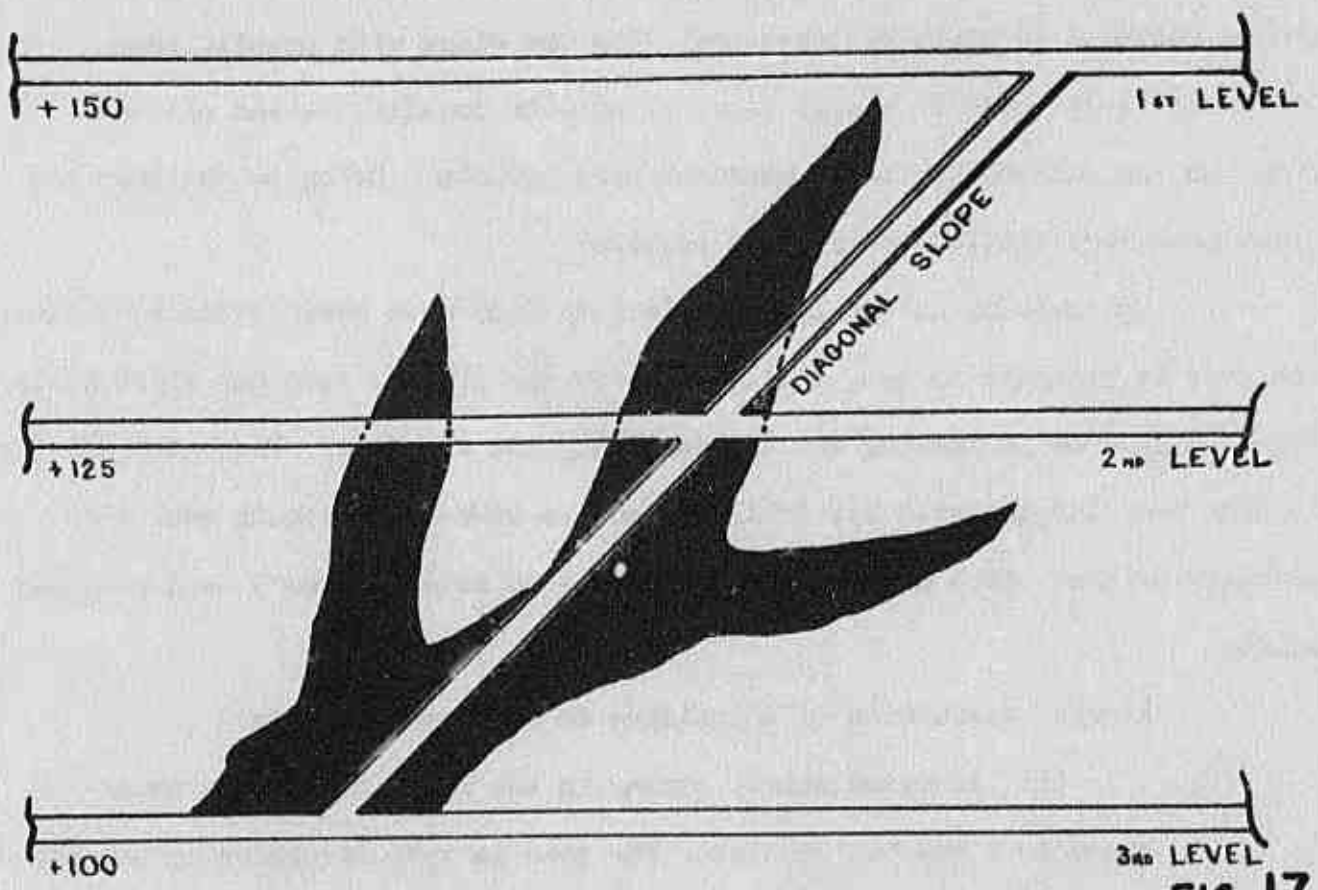


FIG. 17

air "bore hammers". The width of the face varies from shift to shift as does the thickness of the seam.

(2) The Second Cretaceous Seam was of minor importance in the old mining areas. In the Carlotta and Rabaz areas, however, its thickness has increased and a substantial tonnage from this seam is being produced. In Rabaz the seam reaches nearly 6½ ft. in thickness. A 20" rock parting is utilized for backfilling. The undercutting is done by chain machines in the bottom 20" of coal. In addition to drilling the coal, some short holes are drilled in the parting. The quality of the coal produced is similar to that of the first cretaceous seam.

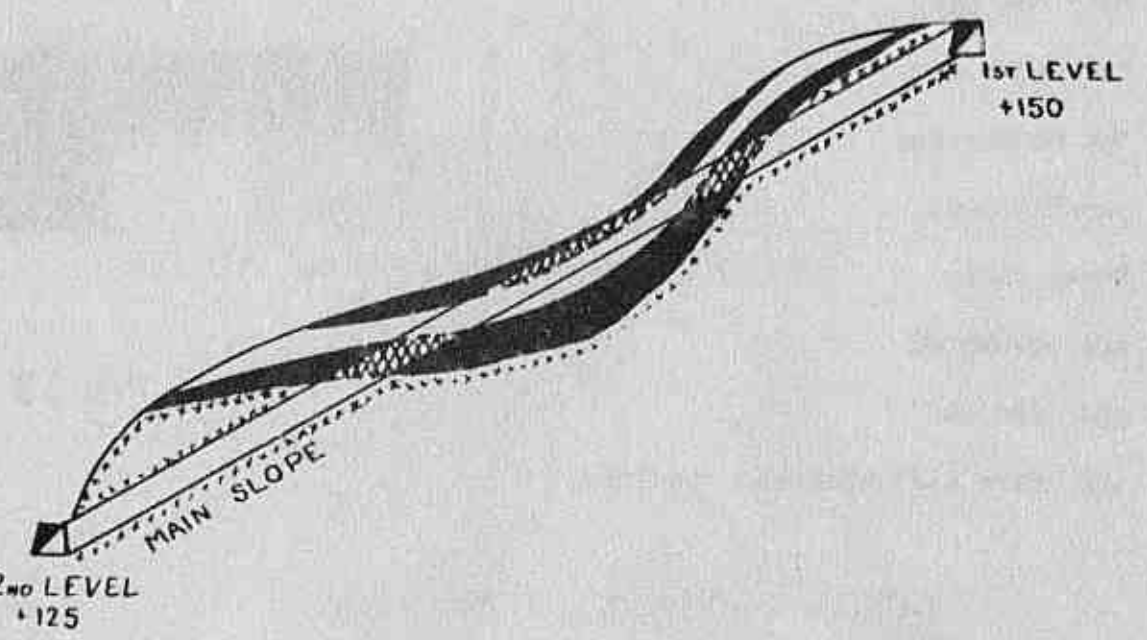


FIG 18

(3) The Third Cretaceous Seam - This seam which was practically negligible in the old mines reaches extreme thickness in the Carlotta basin, ranging from 6 ft. to 15 ft. Backfilling material has to be brought in from the outside and represents a major problem. Where the seam is 10 to 15 ft. thick, it is mined in two or three lifts. See Figures 19 and 20.

The backfilling between the first lift and the upper lifts presents a problem. The top coal is held in place by timbers with long caps in both direction parallel and perpendicular to the face. These are covered with slabs of green lumber. The backfilling is carefully placed in the first lift; that in the second lift is

placed immediately over the first lift. The slabs are intended to decrease the loss of slack into the interstices of the underlying backfilling. These slabs are recovered and used for the third lift wherever required.

CROSS SECTION PERPENDICULAR TO FACE

FIG. 19

CROSS-SECTION ALONG FACE

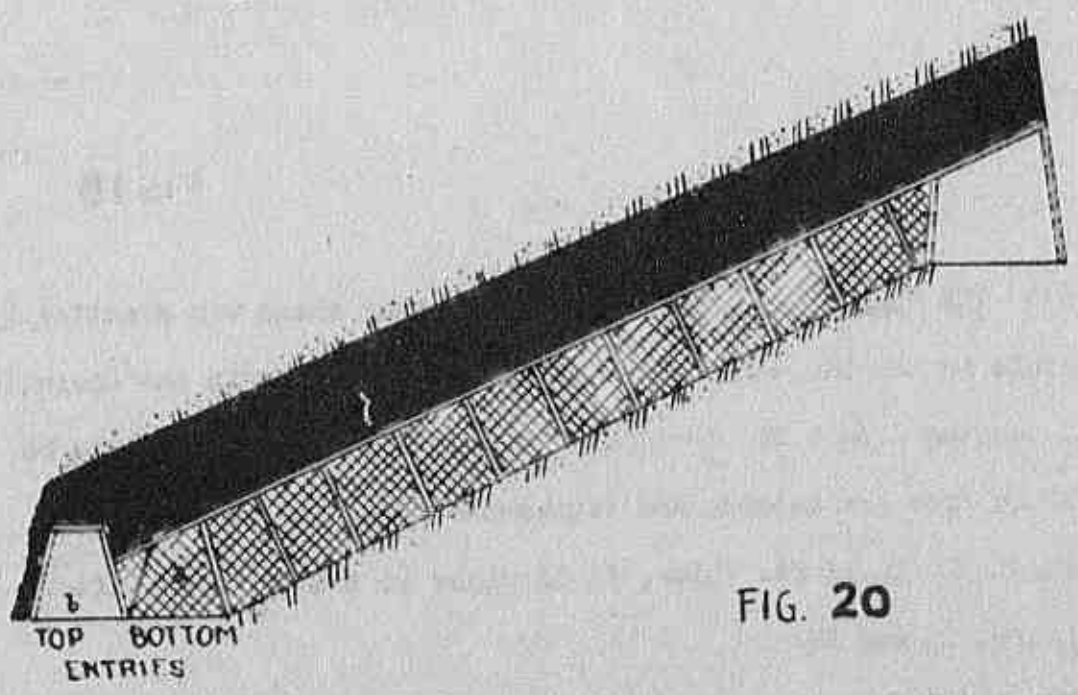


FIG. 20

(4) The Fourth or Superior Cretaceous Seam is a consistent producer in all three of the new mines. Cutting is usually done in the top 35" disregarding the small 10" layer on the bottom.

Backfilling is only partially done in this seam and the stone produced in mining is left in place. It is believed that the dust from this seam is the most highly explosive of any of the seams. The majority of previous coal dust explosions are believed to have originated in this seam. Its regularity and good thickness insure a substantial output in the new mines, especially Rabas and Fianona.

(5) The Main Seam because of added thickness will be a large tonnage producer in the Fianona and Rabas basins. It is believed to be unminable in the Carlotta basin. Mining technique in this seam had not been sufficiently developed in 1938 to establish a definite system. The seam overlies the Fourth or Superior Cretaceous and might, therefore, be mined without backfilling where the overlying Top Seam is unworkable as in the Carlotta basin.

(6) The Top Seam has not been a consistent tonnage producer, lacking thickness and showing inferior coal. It gives promise of being an important factor in the Rabas and Fianona basins. Very little, if any of this coal had been produced in the new mine areas in 1938.

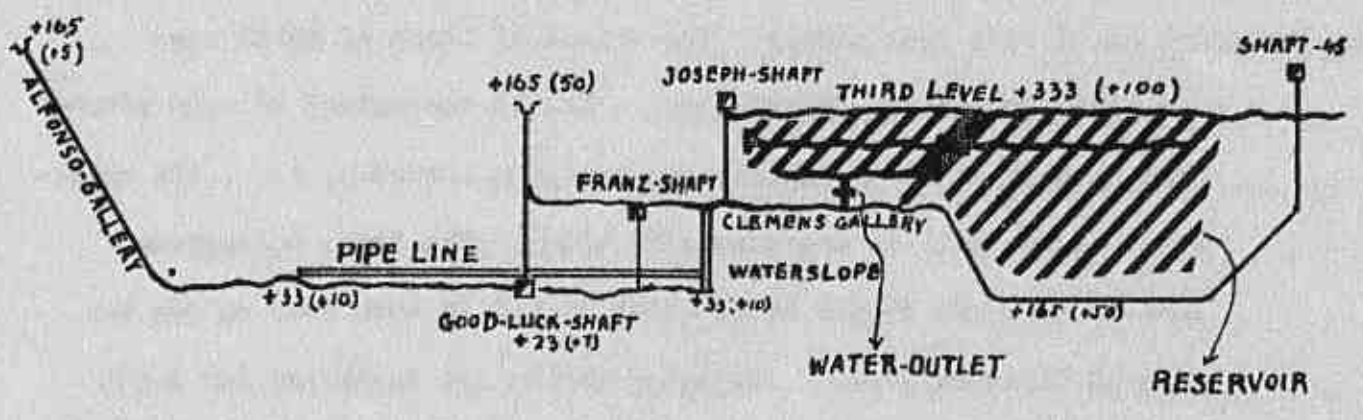
DRAINAGE AND VENTILATION

Drainage has always been a serious problem in the Arsa mines. The nature of the Tarso terrain and the high permeability of the limestone cover has created large caverns and subterranean channels which, when pierced, release vast quantities of stored water. These underground courses carry large volumes of ground water within a short time after surface precipitation, necessitating a system of underground signaling to warn underground workers of excessive rain. The Clemens gallery at elevation +50 meters was first driven

to provide drainage but as the work progressed down the dip it became inadequate. Later the Carlotta gallery was started at elevation -30 but encountered a large cavern after it had progressed 1,000 yards and was discontinued, and finally the Alfonso gallery, at elevation -5, was driven for 2½ miles through to a point nearly opposite Stallie and this gallery supplemented by the Clemens gallery constitutes the main drainage outlet of the old mines. In addition to these galleries a vast underground reservoir in the old work was created in which excess surface water is stored until it can be drained off through a 36" line delivering into the Alfonso entry in such a manner as not to interfere with mine operation. It is stated that an actual discharge of 750,000 gallons per minute has been observed at the Alfonso portal. Fortunately the Clemens and Alfonso galleries together with the drainage reservoir extend for 7 miles along the strike of the seams and probably intersect and discharge the great bulk of the ground water leading into these mines from above elevation -5 meters. Certainly without these galleries the lower areas of these seams could not be successfully mined. To what extent they solve the problem of drainage in the new mines remains to be seen. Figure 21 illustrates the relative position of these galleries and the large reservoir area. The story of the struggle of these mines with drainage is impressive and complicated and its solution is not yet assured.

The pumping provisions, as installed in the Paolo shaft, consist of 5 separate units with a combined capacity of 242,500 gallons per minute. These units are divided into one unit for 7,500 gal/min; one for 15,000 gal/min; one for 30,000 gal/min; and two for 95,000 gal/min. Each unit has a separate motor operating on 2,000 V. AC current. The pump room is excavated in the limestone

and is provided with flood doors which can be tightly closed. Flood doors are also installed at each level and are intended to insure the shaft against sudden flooding. Large sump areas in mined out sections are also provided.



ELEVATION IN FEET (METER)

FIG. 21

The great new drainage hazard is the possible piercing of underground caverns and a sudden release of vast quantities of stored water. Small core drill holes are, therefore, drilled 50 ft. out ahead of the development faces to test the formation.

The provisions for pumping made at the Vittorio and Fianona shafts are not yet known.

VENTILATION

Very little gas has ever been encountered in this district. Italian mine law makes no definite provision for mine ventilation. Natural ventilation produced by the difference between the inside and outside temperatures, supplemented by large quantities of compressed air released during mining operation is very largely relied upon. The compressed air supplies about 10 cu. ft. per minute per man. Some small fan units have been installed in the old shafts

which were intended to increase the supply of air to 65 cu. ft. per minute per man in the area served.

UNDERGROUND PLANT AND EQUIPMENT

Herzog has undertaken to reproduce an inventory of underground plant and equipment as of 1938 from memory. The principal items of which are:

(1) Cables and Transformers - Due to the extent of underground shafts, machine shops underground, pumping stations, etc., the underground installations are unusually large. The total underground load in 1938 was 20,000 KW of which 15,000 KW were used on the inside at Carlotta alone. Insulated cables are installed for 2,000 V., 3 phase, AC to Carpano at the top of Paolo shaft for a distance of approximately one mile. The shaft hoist operates on 2,000 V. AC; auxiliary services are transformed down to 220 V. A big 2,000 V. condenser is installed to correct the power factor. The pumps are operated at 2,000 V. and during high water consume 2,000 KW. A converter to 500 V. DC is installed here for the haulage motors. Power is transmitted at 2,000 V. AC over 2 miles of insulated cables to the working faces. Small transformers from 2,000 V. down to 220 V. are installed to furnish power for mining machines, cutters, hoists, etc. These installations include the necessary switch boards. All motors are "permissible construction" to guard against dust ignition.

(2) Locomotives - Electric locomotives of two types are provided, 25 tons for main haulage and 15 tons for secondary haulage. Line voltage is 500 V. DC. Ten are in use at Carlotta.

In addition 5 storage battery locomotives are in use in secondary galleries. The mine track gauge is 24" (630 MM). The locomotives

are German made.

(3) Mine Cars - The mine cars in use in Carlotta and Fianona up to 1938 were the standard, one cubic meter steel cars used at the Serbariu mine in Sardinia. Their number in 1938 is estimated at 5,000. They are of Italian manufacture. A change to a larger car for the Rabaz mine, owing to the thicker seams was under consideration in 1938. It is not known whether or not the change was made. A few cars of special design are in use but their use is very much restricted.

(4) Trackage - The extent of the mines which are being maintained requires many miles of trackage. It is estimated that there are 20 miles of main line track laid with 40# steel; 30 miles of secondary galleries laid with 25# steel and at least 10 miles of old trackage laid with 15# steel. Steel ties spaced on 12" to 24" centers are used on the main haulways and oak ties on the secondary haulways. Both rail and ties, including switches, are of Italian manufacture.

(5) Cutting Machines - Twenty to thirty heavy duty, longwall cutting machines equipped with 6 ft. cutter bars and 50 h.p. motors, mostly of English and American make, are in use. Four or five lighter duty cutting machines for entry driving are also in use. Compressed air, post punchers are used exclusively in entry driving. These same machines are used for drilling in the rock partings. Over 100 of these punchers are in use.

(6) Shaker Conveyors - Shaker conveyors are used for both the backfilling and coal loading. In 1938 there were approximately 2,000

sections of trough in use. The average size was 15" by 10'. Cradles and rollers to correspond were available. These were principally of Italian manufacture. There were from 60 to 50 drives equipped with 220 V. AC, 10 to 20 h.p. motors of German make.

(7) Dumpers - Twenty to thirty steel dumpers or cages were in use for dumping stone into the backfilling. These are operated by hand and are of German manufacture.

(8) Drill Hammers and Pick Hammers - Five hundred compressed air drill hammers were in use, a heavy type for use in stone and a lighter type for use in coal. From 20 to 30 pick hammers were used, mostly for cleaning tops.

(9) Electric Blasting Machines - One hundred blasting machines equipped for firing 20 and 50 shots were in use.

(10) Hoists - All slope entries are equipped with double drum hoists, operated with 10 to 20 h.p. 220 V. AC motors. There are also some smaller type hoists used for manuvering cars, driven by 5 h.p. 220 V. AC motors. The total number of these hoists is approximately 100.

(11) Pumps - Besides the large, heavy duty shaft pumps already referred to, there are 60 to 80 various sized smaller units scattered throughout the mines.

(12) Sprinkling Reservoirs - There are 20 to 30 250-gallon sprinkling reservoirs equipped with compressed air discharge under working pressures of 90# per square inch.

(13) Ventilating Piping - About 3,000 yards of 12" to 18" sheet metal and canvas tubing are in use throughout the mines.

(14) Compressed Air Lines - It is estimated that there is the

following mileage of compressed air lines in the mines:

8" - 1 mile; 6" - 4 miles; 4" - 6 to 8 miles
and 2" - approximately 20 miles.

(15) Sprinkling System - The system of piping for the sprinkling system is designed for pressures up to 90# per square inch. It is estimated there are from 5 to 6 miles of 1" line and 6 to 8 miles of ½" line. Large quantities of rubber hose of 1" and ½" diameter, are kept on hand. It is estimated there is 5 to 6 miles of 1" hose and 10 miles of ½" hose.

(16) Miscellaneous - Large supplies of fittings, shooting wire, shaft cables, rubber cables, electric supplies and spare parts of all kinds are maintained.

(17) Timber - Mine timber is mostly secured from the Balkan countries by vessel although some come in by truck from Austria. Large timber supplies are maintained at the shipping ports and at the portals. The average price of wood in 1938 was between 70 and 100 Lira per cubic meter (35.22 cu. ft.). The consumption of timber per ton of output was between .03 and .05 cubic meters. (4 Lira or about 20¢ USA/ton)

(18) Explosives - The safe storage of explosives is stipulated by law. It is estimated that consumption amounts to approximately two tons per day. The type of explosive in use is permissible, known as Griscutine. The large powder houses are provided for storage duly located and constructed to comply with the legal requirements.

(19) Mine Lighting - Shaft partings, main haulage partings, machine shops, pump rooms, transformer stations, etc., are equipped with permanent electric lighting systems. The men are equipped with

portable electric lights and carbide lamps. Owing to dangerous dust localities, the men are restricted to the electric light in these areas while open carbide lamps are permissible in other safer localities. The lamps are the property of the company.

It is believed that if these mines have continued to be developed in accordance with the projected program of 1938 all of the items in the above rough inventory have been substantially increased. On the other hand failure in upkeep and the inability to secure replacements has no doubt destroyed the usefulness of many of the items. Until access can be re-established, all of these factors are mere conjectures.

SURFACE PLANT AND EQUIPMENT

MINING TOWNS

There were five towns or groups of houses in 1938, some old and some new. These are as follow:

CARPANO

This is the oldest mining town in the Arsa District and has been in use for over a century. There are five large apartment buildings, one of which is an office building and apartment combined. The others are occupied by the engineers and office employees. A few old buildings containing numerous apartments are occupied by shop and mine specialists. The main shop and stock room is located here in a large building; also a compressor and transformer station. There is a church, an amusement hall, a welfare apartment, and an employee's restaurant. There is an abundant fresh water supply. A good road is provided to Albona six miles away. Convenient access to the mines is had through the Clemens Gallery.

STERMAZ

This mining town is also part of the old mine layout. It houses 100 mine families living in very old one story, two-room apartments. There are two large modern apartments for the accomodation of engineers and office employees. Shaft 45 is nearby and an office building, power plant, hoisting room and repair shop are located near the shaft. An abundant fresh water supply is provided and the town is connected by a short road one-half mile long to the main highway between Pisino and Albona. Access to the mine is had through Shaft 45.

VINES

An old town was built here nearly a century ago. A new town was

added in 1922-23 when, 40 new two-story houses were built with two and three-room apartments per family. A good water supply is furnished from a stand pipe and each family has a garden. The total population is about 400. It is located on the main road between Pisino and Albona. The hoist house for shaft Joseph and an old machine shop is a part of this layout. The men have access to the mines through shaft Joseph and thence via the Clemens gallery.

ARSIA

This is one of the more modern towns and was built in 1936-37. It consists of 200, two-story, eight family, modern houses equipped with all modern improvements including running hot and cold water, bath rooms, gardens etc. A municipal office building, theatre, church, restaurant, bachelor apartments and company store are located in the center of the town; also the modern company office building, the offices having been moved from Carpano to Arsia. Water is supplied through a stand pipe. The town is located near the main road to Albona about six miles away. It is conveniently located for access to the mines through the portal of gallery Carlotta.

STALLIE VALPEDOCCHIO

This town only includes a few houses for the employees at the washery and loading plant, five or six families in all.

ALBONA AND FIANONA

Extensive new towns were projected at Albona and Fianona to accommodate the new mines at Rabaz and Fianona. It is not known to what extent these plans have been carried out.

POWER PLANT

The electrical power used for the Arsa mines is transmitted from Hydro-Electric plants in Northern Italy. The main transmission line carries 35000 V. and extends down through the center of Istria to Pola. The main switch for the mines is located at St. Vincenti and delivers the current to the transformer station at Stallie where it is stepped down to 10000 V. and transmitted to all important mine installations.

One "stand by" steam plant is installed at Stermaz with a capacity of 2000 KW. It is designed to carry the inside pumping load in case of power interruption.

A second big underground standby plant, with a capacity of 20000 KW, was designed to be installed near Stallie. It is not known whether or not this unit has been installed.

The mine load in 1938 frequently reached a peak of 20000 KW. Transformer stations are located at Fianona, Stermaz, Vines, Albona, Carpano, Carlotta, Stallie, Val Pedocchio and Rabaz.

The national power plants have an abundance of power reserves but are subject to interruption during severe winter weather. Such an interruption occurred in the winter of 1928-29 which lasted for 8 days.

SHAFT HOISTS

The following are installed or are to be installed in the various shafts:

Stermaz	- Shaft 45	- 200 HP. motor Depth 787 ft.
Vines	- Joseph Shaft	- 200 HP. motor Depth 525 ft.
Carpano	- Good Luck Shaft	- 300 HP. motor Depth 656 ft.
Carlotta	- Paolo Shaft	- 300 HP. motor Depth 984 ft.
Finanona Shaft	-	- 300 HP. motor Depth 820 ft.
Vittorio Shaft	-	- 600 HP. motor Depth 1986 ft.

COMPRESSORS

The compressor central for Carlotta is located at Carpano. There are four units with a combined capacity of 20000 cubic meters (= 700,000 cubic feet per hour = 11,500/ cubic feet per minute). The smaller units are piston type and the larger are turbo-compressors. The air is compressed to 85# to 95# per square inch. They are water cooled, large air reservoirs are maintained on the outside. The compressed air is delivered inside through 8" air lines.

Similar units are designed for Fianona and Rabac and are presumed to have been installed.

MACHINE SHOPS

The main shop is located at Carpano. It is housed in an extremely large structure and is divided into machinist, mechanical, electrical and carpenter departments. The shop is well equipped with all modern items and is prepared to make all except very exceptional repairs. Because of the isolation of this locality, unusually comprehensive machine shop facilities are essential. Supplemental shops are maintained convenient to the portals of each of the mines.

SUPPLIES

A complete line of supplies and repair parts are kept in a large stock room located at Carpano.

WASHERIES AND TIPPLES

The coal coming from the mines carries from 15% to 25% impurity. The sp.gr. of the coal is 1.15 to 1.20 and of the impurity, 2.50. This affords an ample margin for cleaning.

The washery and tipple are combined. The coal is dumped from the mine cars into a silo from whence it travels across a shaker screen. The 3" lump and over is delivered to a long picking table where women workers pick out the impurity after which the coal is accumulated in a lump silo. The residue down to ¼" in size passes through the washer. The ¼" and under is not washed. The various silos unload direct into 6 to 7 ton railway cars for delivery to the terminal. Figure 22 illustrates the complete tipple and washery layout.

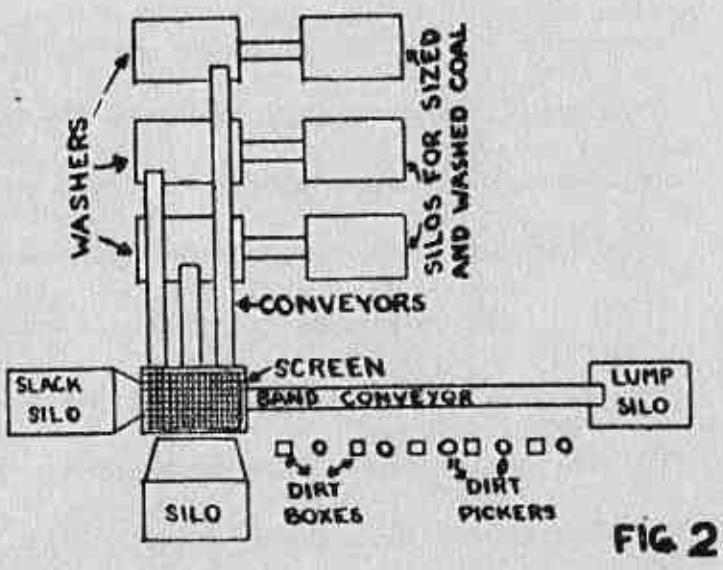


FIG. 22

Three washeries are believed to have been installed; one at Stallie with a capacity of 3000 tons per 24 hour day; one at Pianona with a capacity of 3000 tons per 24 hour day; and one at Albona with a capacity of 6000 tons per day.

The residue from washing, when dried has a heating value of 8000 to 10,000 BTU. and is all consumed at the "stand by" steam plants.

COMPANY STORES

Company stores are located in all of the mine towns. Their sales are confined to food, clothing and shoes. Credit to the extent of one 15 day period is allowed.

HOSPITALS

Hospitals were projected at all the new towns but it is not known

to what extent this plan has been carried out.

MISCELLANEOUS

Among the miscellaneous items not already referred to is a large reservoir filled from a large spring in the Carpano Valley and located between Alfonso and Carlotta from which a 6" pipe line 2½ miles long delivers an abundant supply of fresh water to vessels taking on coal at Valpedocchio. This is a very important item.

Slate disposal has been a serious problem in the past due to the lack of flat land on Carpano Creek and the refusal of private owners to sell their small tillable areas of farm land. The mouth of Carpano Creek occupied by a large swamp was utilized but the weight of the slate caused the whole area to heave, thus backing the creek water up over neighboring farm areas. Expensive litigation resulted. It took several years of expensive steam shovel work to correct the damage and return the creek to its natural level. Foreseeing these difficulties, the Company purchased necessary allotments of land from the owners before starting the development at Rabaz and Fianona. In the meantime, however, the greater coal thickness in the new mines has reduced the quantity of rock produced in mining and the back filling not only consumes all the rock which is produced in the mines but requires large quantities to be taken in from the outside. The old dumps have, therefore, been equipped with suitable machinery to load and transport waste back into the mines for use as backfilling material.

MINE LABOR

The labor situation in the Arsa district is complicated by the

raw disagreeable climate. A cold northeast wind known as the Bora sometimes blows a gale during the winter months for three and four days at a time at velocities of 50 and 60 miles per hour. In Trieste and Pola guard ropes are strung along the sidewalks to enable people to get about and in the country piles of large flat stones are kept on hand to spread over the roofs of farm buildings to keep them from being blown off. The land is thin and poor and only scattered patches are tillable. The Istrian people are inured to hardships and are rugged and hardy and accustomed to hard difficult work. They are very largely of Croate and Slovene origin and primarily Yugoslavian in their sympathies and loyalty. The Fascists fearing their preference for the Yugoslave state made a consistent but unsuccessful effort to transplant native Italians from the Italian mining provinces of Tuscana and Piedmont. Attractive mining towns were built and improved living conditions provided. By 1938, the attempt to transplant Italian miners was definitely a failure and native Istrians became the prevailing group. Buses operate for a radius of 20 miles, picking up and returning workers to their homes. It is estimated that the number now employed is substantially 10,000. All but about 1,500 of these have had no previous mining experience and this ignorance of mining presents a serious problem.

The average production per day per coal loader in 1938 was 2.461 metric tons, or 5427 pounds. The average production per day per inside worker was 1.154 metric tons, or 2539 pounds and the average loading per man for all employees on the payroll was 0.937 metric tons or 2061

pounds. Later figures on production per man would have little weight due to the large number of workers employed on development work and the inexperience of many of them. Owing to the much thicker seams to be mined in the new areas, the production per man, when capacity production is reached, should increase substantially.

The men are compelled to join the union by law. Strikes are illegal. The many regulations imposed by law are supervised by the Bureau of Mines through a system of inspectors. The mine labor contract has evolved through many years and is quite complicated. The basic scale for day workers in 1938 for a portal to portal 8 hour day was as follows:

Miners with pay rates	- 15.40 to 17.60 lira	=	$0.77 to $0.88
Helpers	- 12.20 to 14.50 "	=	0.61 to 0.72½
Timberers	- 15.40 to 19.20 "	=	0.77 to 0.96
Shaft timberers	- 17.60 to 22.00 "	=	0.88 to 1.10
Mechanics, Electricians, etc.	- 17.60 to 22.00 "	=	0.88 to 1.10
Outside Workers	- 12.20 to 15.40 "	=	0.61 to 0.77
Shop Specialists	- up to 25.00 "	=	up to 1.25
Women	- 7.00 to 12.00 "	=	0.35 to 0.60

(In 1938 - $1.00 = 20 Lira). The purchasing power of a dollar in Italy, however, was more than twice the purchasing power of a dollar in United States. The living standards of the Italian miners are, of necessity, much lower than the living standards of an American miner. Automobiles, frigidaires, radios, etc., are unknown among the Italian miners.

The contract rates have evolved over a long period of time and are intended to equalize the differences between thin and thick coal, thin and thick partings, standard difficulties, etc.

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The scale in effect in 1938 was as follows:

Seam Thickness Centimeters	Seam Thickness Inches	Price Per Car Lira	Price Per Car Dollars	Price Per Car for Each Standard Difficulty Lira	Price Per Car for Each Standard Difficulty Dollars
50 cm.	20"	3.10 L.	$0.15½	.40 L.	$0.020
55 cm.	22"	2.95 L.	0.14 3/4	.38 L.	0.019
60 cm.	24"	2.80 L.	0.14	.36 L.	0.018
65 cm.	26"	2.65 L.	0.13½	.34 L.	0.017
70 cm.	28"	2.50 L.	0.12½	.32 L.	0.016
75 cm.	30"	2.35 L.	0.11 3/4	.30 L.	0.015
80 cm.	32"	2.20 L.	0.11	.28 L.	0.014
85 cm.	34"	2.05 L.	0.10½	.26 L.	0.013
90 cm.	36"	1.90 L.	0.09½	.24 L.	0.012
95 cm.	38"	1.75 L.	0.08 3/4	.22 L.	0.011
100 cm.	40"	1.60 L.	0.08	.20 L.	0.010

For instance, in coal 20" thick the expected loading per day would be 5 cars x 3.10 L. = 15.50 L. = $0.75½. In 40" thickness the expected loading would be 10 cars x 1.60 L. = 16.00 L. = $0.80.

The standard difficulties for which allowances are made are bad air, water, shooting from the solid, bad top and very hard coal.

In all cases the impurity is paid for at the rate of .04 L. per tenth of impurity. That is, if a 20" seam of coal contains an additional 16" of stone, the percent of stone is 16/20 = 8/10 and 8 x .04 = .32 L. and the loading rate for the coal is, therefore, 3.10 - .32 = 3.42 L. = $0.17 1/10. The miner would, therefore, receive for the 5 car day, he is presumed to have loaded, 17.10 L. or $0.85½ as against the 16.0 L. = $0.80 he would have received had he loaded 10 cars in 40" coal.

The loading per car is presumed to be for the clean coal in each car. This item is determined at the washery. The impurity in the car is not paid for.

The men are charged with their explosives which averages five pounds of explosive @ 1 L. and ten detonators @ .10 L. per shift. The explosive is charged at the rate of 1.00 L. per pound and the detonators .10 L. = 0.5¢ per

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detonator. These items total .6 L. = 3¢ per shift and the above miner working in 20" coal actually received $0.85½ - 3¢ = $0.82½ for his day's work. What has happened to these rates since 1938 is not known.

In addition to their contract rate, the men are paid for all timber set. Yardage is paid for "galleries and entries in stone", headings, where the thickness of the stone equals the thickness of coal and where the width of coal is less than 15 feet. Ditching is also paid on a yardage basis.

These provisions are very complicated and require special study. The squad system of pay is in use which also complicates the problem.

Organization men are also organized by the government into a separate union. They consist of foremen, mine bosses, engineers and office workers. The following salaries were customary:

Classification	Monthly Rating Lira	Dollars
Mine Foremen	600 L. to 1,200 L.	$30.00 - $60.00
Mine Bosses	1,000 L. to 2,000 L.	50.00 - 100.00
Engineers	1,200 L. to 300 L.	60.00 - 150.00
Office Employees	600 L. to 2,000 L.	30.00 - 100.00
Executives --- Individual contracts.		

Every mine worker is allowed one week's vacation with full pay per year for each full year of service. Salary men are allowed from two to four weeks paid vacation for each year of service. The workers were paid bi-monthly and the salary men monthly.

The inside work is done in three shifts as follows: first shift 6-00 to 14-00; second shift, 14-00 to 22-00; third shift, 22-00 to 6-00. Shifts are figured on an 8-hour basis, portal to portal.

Outside work is done in two 8-hour shifts, running from 6-00 to 14-00 and 14-00 to 22-00. The second shift in the tipple sometimes starts at 16-00 and runs to 24-00.

COST

The same system of cost accounting is used at Arsa as is used in Sardinia. It is kept under the following headings and the approximate percentage of the total cost, where known, is indicated opposite each heading:

Inside Cost	
Development in stone	5-10%
Development in coal	10-20%
Mining (labor)	30-40%
Inside haulage	10-15%
Timbering	10-15%
Hoisting	10-15%
Drainage and ventilation	5-10%
Outside Cost	
Tipple	
Haulage	
Shipping	
Stone	
General Administration	
General Expense	
Depreciation	
Investments	
Overhead Office Expense	
Taxes	

The total cost for 1938 is estimated at from 60 L. to 70 L., or $3.00 to $3.50 per ton. Considering the relatively low wage scale, this is a very high cost. If and when the thicker coal areas are fully developed, this cost should be substantially reduced. To what extent the war condition has affected wages and other costs is not known. It is to be presumed they have increased very substantially.

MAPPING AND SURVEYING

A very accurate map record has been kept of these mines for over 100 years. The oldest map of record is dated in 1830. Three complete files of these maps are kept, one at the Mine Office, one at the office of the Bureau

of Mines and one in the general offices of the company in Rome. Great accuracy is required because of the length of some of the galleries. Some of the points to be connected have been standing 80 years or more. All new work is posted every 15 days.

The maps are set up on a coordinate system based on the Franz shaft as zero point and are not connected into the government coordinate system. The different levels are carried in different colors. Where the active work is superimposed on lower work, separate maps of each seam are made. Levels of the galleries and entries are kept progressively.

The engineers check the remaining coal reserves progressively and and make suitable reports to the general office. All surface records as well as the inside records are kept by the engineers.

GENERAL CONCLUSIONS

(1) In view of the strategic value of this District, its continued development should be pushed aggressively.

(2) Until actual physical inspection is completed, the problem of rehabilitation cannot be analyzed.

(3) Competent personnel, capable of assembling and analyzing the vast files of maps and other engineering data, should be made available.

(4) It is believed that a local organization, familiar with the intricacies of this old and complicated project, is vital to its successful operation.

(5) Restoration of receiving ports and vessel tonnage capable of distributing the output of these mines must be synchronized with the development of coal production.

(6) A basic organization whose function it will be to expedite supplies and machinery to both Sardinia and Arsa should be set up and implemented. (In U.S.A.)

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BROWN COAL AND LIGNITES OF CENTRAL AND SOUTHERN ITALY

PART II

Deposits of brown coal and lignite are widely scattered throughout central and southern Italy. The most widely known deposits are in Tuscany, south and east of Florence and Campania, east and southeast of Naples. Further deposits are worked in Calabria on the so-called toe of the Italian boot. Inasmuch as, because of their low grade, these deposits were of small importance before the war, very little authentic data regarding them is now available. It is generally believed that a very large increase in production has taken place during the war.

Data regarding the increase in the reported production from 350,000 tons in 1934 to 4,000,000 tons in 1942 is conflicting and obscure. Such confirmation as has been had indicates that production releases by the Italians have been deliverately framed to overstate the production figures. During World War I, the production of lignite and brown coal was pushed energetically and reached a maximum of 2,000,000 tons taking advantage of the most favorable easily developed locations of that period. That a production of 4,000,000 tons has now been reached should therefore be accepted cautiously.

QUANTITY

Brown coal and lignite are most widely distributed throughout the provinces of Tuscany and Umbria in central Italy, south and southeast of Florence. Other deposits occur in Calabria province constituting the toe of the Italian boot, and in Campania province, the vicinity of Benevento and the Mercure basin near the West coast, southeast of Naples. Mining occurred at one time in the Marecchia Valley, west of Pesaro, in what is reported to be an area of higher quality coal. These mines had been abandoned however up to 1938. War conditions may have brought about their re-opening. Some

recent research in line with the National program for autarchy is said to have resulted in the discovery of some excellent beds of lignite in Sicily in the commune of Messina at Gravitelli and at Salice. So far as is known, there has been no development at these Sicilian deposits.

These coals are believed to occur in lense shaped masses, variable in extent rather than in continuous seams or beds. They vary widely in thickness ranging from zero to seven feet. Generally the thicker seams contain more impurity than the thinner seams. Extensive folding and faulting has occurred in the Tuscany areas and the dip of the seams is all the way from 0° to 90°. In Tuscany, unlike other provinces in Italy, the title to the coal runs with the surface ownership, instead of being vested in the state. There being many large and small owners, this has resulted in numerous small farm mines. One estimate for 1937 places the number of mines at 43.

Estimates of reserves vary substantially. The best figures available are:

Lignite	60,000,000 m/t
Brown coal	150,000,000 m/t
Peaty lignite	180,000,000 m/t
Peat	25,000,000 m/t
Total	415,000,000 m/t

CHARCOAL AND WOOD

It is reported that, owing to the shortage of coal during the war, there has been a large increase in the use of firewood and charcoal. The volume consumed throughout Italy in 1942 is estimated to have been 11,000 tons of firewood and 66,000 tons of charcoal.

QUALITY

Specific chemical analyses throughout various areas are not

available. A concensus of the data available estimates the brown coal of Campania as containing:

Moisture	25 to 60%
Volatile Material	33 to 65%
Fixed Carbon	11 to 40%
Ash	13 to 44%

The following table shows some typical analyses:

	Grosseto	Branco	S. Giovani Valdaroso	Morgnano-Sant
	Lignite	Brown Coal	Brown Coal	Brown Coal
Moisture	12.84	53.02	26.98	35.90
Ash	7.20	12.07	6.19	9.28
Volatile	33.77	19.62	41.58	34.19
Fixed Carbon	46.17	15.30	27.24	20.63
Sulphur	1.98	1.09	0.69	2.45

BTU - Dry Basis - 5,000 to 5,500 Calories = 9,000 to 9,900 BTU.

Because of the low grade of this coal, it cannot justify any very substantial transportation cost. It is estimated that Italian lignites, generally, are not transported more than 124 miles and are usually processed near the mines or consumed in power units located in the mining area. Much experimentation has been done and there are reports that large processing units have been installed during the present war. The large production reported would tend to confirm a large increase in processing plants.

When dried the coal is reduced to a fine powder and must be briquetted in order to be used industrially. These briquettes, while high in ash, are low in sulphur and constitute a usable domestic or locomotive fuel. The dried coal adapts itself also to steam power plants using powdered fuel.

The output of the most highly developed of these deposits in the Tuscany area, those of Valdarso and Spoleto, are used by a large gasification plant at Terni. A 1937 report mentions a hydrogenation plant under construction at Legharn with an annual capacity of 150,000 tons of lignite. It is believed that during the occupation period these coals, because of their quality, will be of very limited value.

Up to the opening of the present war, mining of lignite and brown coal had not developed any specific technique. The mines were mostly small farm mines. Lack of uniformity in dip and extent discouraged any attempt at systematic mining. Some mines were shallow shafts, other crude drifts or slopes. The Valderno shafts were an exception to this rule. A pillar and stall system of mining was used and about 1,000 workers employed in 1926. Other extensive mines in central Italy are located at Grosseto, Mt. Amiata, Margnano and Branco. In southern Italy the principal mines are in the vicinity of Tufo, Mercure and Brintico. Detailed information regarding these mines is not available. The coal is generally "shot from the solid" and then, because of its woody nature, extracted from the face with axes instead of picks. Machine mining is practically unknown.

It is understood that the Lignite Administration of Italy is engaged in studying various projects designed to overcome distribution difficulties. It was found during World War I that shipments into distant markets consumed more energy than the coal produced. Considerable attention is being paid to improvements in drying methods.

The conclusion of the matter is that these coals are of such poor quality that they are only helpful in the immediate locality in which they are produced. These localities are barren of any substantial industrial activity.

P.A. 313

HEADQUARTERS
ALLIED CONTROL COMMISSION
Public Works and Mines Sub-Commission
APO 394

LAJ/cw

ACC/133/PWM

28 Jan 44

Subject: Relations with Italian engineering and construction Personnel under A.C.C. operations.

To : Public Works & Mines Officer.
Region I.
Region II.
Region III.
Region IV.

1. Attached hereto is a copy of P.W. & M Instructions No 1, dated 21 Jan 1944, outlining the relations between Public Works and Mines field representatives and Italian engineer or construction personnel.

2. Will you please direct all of your engineering assistants to strictly observe these instructions.

L.A. JENNY.
Lt. Col, C.E.
Director.

CC to Col. Spofford. ✓
Mr. Grady.
Col. Adams.
DDW.(Adv A.F.H.Q.)
P.B.S. Engineers.

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ALLIED CONTROL COMMISSION
Public Works and Mines Sub-Commission

PW&M
INSTRUCTION N°1
21 Jan.1944

SUBJECT: Relations with Engineering Officials of the Italian Government (Genio Civile)

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1. It is becoming increasingly important that all Officers employed with the P.W. and M. Sub-Commission should, from now onwards, clearly understand their relationship with the above Officials; also, equally, with any other Engineers or agencies who may, from time to time, be charged with executive responsibility for Public Works or Mines projects (e.g.State, Provincial, Communal, or Private). Contacts are likely to become more and more frequent, and large sums of money will be involved.

2. Financial

(a) Ultimate responsibility for financing projects will rest with the Italian Government, and though funds or credits may be arranged by the Finance Sub-Commission (of A.C.C.) to and through the Finance Minister of the Italian Govt., it is understood that all these will eventually be brought to account as a debit against that Government. This fact will be brought directly to the notice of the Genio Civile, or other officials, and possibly also, through the Minister of Public Works himself, This in itself should act as a strong deterrent against any tendency to wasteful expenditure, or over-expenditure. Nevertheless, it will remain the duty of this Sub-Commission to observe closely everything that is being done, and to bring to notice immediately any instance of what may appear' to be an unnecessary expenditure or wasteful practice. Officers are at full liberty to make representations locally, to the responsible executive official, to that end. In case such are ignored, and only then, a report should be made to this Headquarter with a view to action through the Chief Engineer of the Genio Civile at Naples; or, in extreme cases, directly through the Minister himself.

4623

(b) Further, there will be cases where A.M.G. or the Military Authorities may furnish assistance to a given project in the form of men,transport, plant, materials, etc, and at regular intervals, possibly monthly, they will furnish to this Sub-Commission

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4623

(b) Further, there will be cases where A.M.G. or the Military Authorities may furnish assistance to a given project in the form of men,transport, plant, materials, etc, and at regular intervals, possibly monthly, they will furnish to this Sub-Commission a statement relating to it with values or prices where possible, expressed in sterling or dollars. After verification these will be forwarded to the Finance Sub-Commission, for eventual debit against the Italian Government as in (a) above.

3. Professional Relations

(a) Nothing is more calculated to undermine the status and position of the Italian engineers, with whom this Sub-Commission has to work, than interference with their executive functions. By this is meant the direct issuance of orders to contractors, foremen, or workmen by officers of the Sub-Commission. Repercussions to such action are likely to be immediate and far-reaching. The authority of the Italian engineers "vis-a-vis" their contractors will be prejudiced; they may remain in ignorance of what is being

done; financial complications will arise when the time comes to settle final accounts; misunderstandings will occur; and (worst of all) they may very properly feel a sense of personal grievance. Such conditions would militate strongly against any feeling of helpfulness and co-operation that might previously have been established.

(b) Some of the important functions of this Sub-Commission are (1) to review and approve projects, (2) to assist in their preparation and be of assistance wherever possible, (3) to see that funds are properly applied, (4) that approved estimates are not exceeded, (5) that projects are carried out on sound engineering principles, in a business-like manner, and with due expedition.

(c) All these can be ensured by cultivating friendly relations (but not unduly so) with the Italian engineers with whom officers are thrown into contact, and at the same time maintaining a strict aloofness from the slightest attempt to issue orders directly to contractors, or their workmen.

(d) Should an Italian Official appear to be wilfully or deliberately ignoring the advice tendered to him by an officer of this Sub-Commission, even then it is not competent for the officer to give orders direct to workmen or contractors, unless the work is on a high military priority project and when, not to issue instructions direct, would jeopardize our military effort which we can under no consideration permit. It is hoped that such instances will be wholly exceptional, or indeed non-existent. But, should they occur, the duty of the officer is to report the full facts to this Headquarter with a view to getting official action taken by the Italian Government.

4. Finally, in the course of any project it is almost always necessary to incorporate certain variations, or modifications. Officers will use their best endeavors to agree upon these with the Italian official in advance, and apart from the fact that the latter gives the actual orders it will also be his duty to take them into consideration when the "final account" is settled with the contractor. It is only by this means that controversies can be avoided; coupled with the keeping of a written record by the officer of this Sub-Commission, stating in some detail exactly

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L.A. JENNY
Lt.Col. C.E.R.
Director

C O N F I D E N T I A L

RESTRICTED FARGO 567

313

1

File Report II

FARGO

RESTRICTED

ROUTINE

30 JANUARY 1944

10050 SPOFFORD

Distwo for Report II

_____YOU ARE DIRECTED TO AUTHORIZE AND ASSIST CAPT GILLESPIE CMA AMG MINING DIVISION AT CROTONE CMA TO PURCHASE AND EXPORT ONE ZERO ZERO RPT ONE ZERO ZERO METRIC TONS OLIVE OIL TO SARDINIA FOR CONSUMPTION BY COAL MINERS PD PHRASE PAREN FARGO FOR SPOFFORD PAREN TO DISTWO FOR AMG REGION TWO FOR ACTION AND DISTWO FOR CROTONE FOR GILLESPIE AMG MINING DIVISION FOR INFORMATION PD CITE FARGO FIVE SIX SEVEN PD SIG MELLIS CMA SARDINIAN COAL MINE AGENT AT CROTONE CMA HAS FUNDS FOR THIS PURCHASE

4622

L. F. NICKER
Lt. Col. AGD
Adjutant General

RESTRICTED

CONFIDENTIAL

file INFO DCCAO (2)

1878

PENINSULAR BASE SECTION
SIGNAL MESSAGE CENTER

28 Jan 44

CONFIDENTIAL

ROUTINE

CG PBS FARGO FOR SPOFFORD

NONE

SIGNED CINC

272111A

280730A

43923

FHMGS

SUBJECT IS REQUISITIONS FOR SICILY SULPHUR MINES. LETTER OF 22ND JANUARY INDICATES NEED FOR 6000 TONS COAL FOR 1944 TO IMPLEMENT SULPHUR PRODUCTION THRU 1944. ACCOMPANYING REQUISITIONS COVERING 8 MONTHS COAL REQUIREMENTS ARE ONLY FOR 1000 TONS. PLEASE EXPLAIN.

PBS DIST

ACTION AMG HQ
INF MGS ADV
CG
SECY

AMG DIST

(ACTION) ECON SEC (2)
(INFO) DCCAO (2)

11469

4621

CONFIDENTIAL

F.A. P.W.T. Misc.

1535

Subject: Civil Road Organisation.

313

AFHQ Adv Adm Echelon,
C.T.

78/Q.

20 Jan 44.

HQ., ACSF.
Fifth Army.
Eighth Army.
No. 2 District.
No. 3 District.
Peninsular Base Section.
AFEC/MTO (Prov)
ACC.—

HEADQUARTERS
23 JAN 1944
AMG.

1. In order to provide for the more effective maintenance of roads and control of road work in Italy, an Italian Civil Road Organisation is being established as part of the Italian Ministry of Public Works.

2. The head of the Organisation will be the Italian Director of Public Works who will be represented in each Compartment by an Italian engineer from his staff. The Organisation will be under the control of ACC/AMG, who will also appoint an ACC/AMG engineer for each Compartment.

3. The Organisation will eventually be responsible for the maintenance, including snow clearance, of all roads in occupied Italy, in accordance with Allied requirements. Forward of Army rear boundaries, the responsibility of the organisation will be limited to specified areas or roads to be agreed from time to time.

4. Arrangements are being made by ACC/AMG to ensure that adequate funds are made available for the payment of all civilian wages and for the purchase of available materials.

5. It will, owing to limited Italian resources, always be necessary to provide some assistance from military sources in the form of transport, plant and materials.

6. Briefly, the procedure to be adopted for the carrying out of road work by the Civil Organisation is that military engineers will submit requirements to ACC/AMG engineer representatives. The latter will make all necessary arrangements with the Civil Road Organisation engineers and notify those to the military engineers concerned, including information as to any demands for military assistance.

7. The Organisation has been set up, and is ready to operate to a limited extent, in some Compartments.
In such cases, the procedure outlined above will be adopted forthwith and the maximum practicable use made of the Organisation.

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In such cases, the procedure outlined above will be adopted forthwith and the maximum practicable use made of the Organisation.

8. Further details of the procedure, particulars as to the Organisation, its machinery, its extension from time to time and the levels at which contracts can be made by military engineers will be notified through engineer channels by DDW this HQ.

for Major General,
Deputy Chief Administrative Officer.

Copy to: AFHQ (2)
AMG, HQ ACSF
SOS NATOUSA
AFSC/ATC
214 Group RAF
M.M.I.A.
G(SD)
G-4
DDW
Labour
War Diary(2)

231112A [illegible]465 **SECRET** RAD

FM. AT-OPN. BASE SECT. SIG. MES. CENT. 23 JANUARY 1944

SECRET

PRIORITY

CG PBS FOR FARGO

NONE

CINC

222016A

231112A

41704

FHMIS

313

HEADQUARTERS
23 JAN 1944
AMG.

LT COL KOENIG LEAVING HERE FOR YOU AM 23RD ETA NAPLES 1310 REQUEST YOU MEET.

PBS DIST.

ACTION AMG-HQ

INFO C.G.

SECY

AG MISC. DIST.

(INFO) DECAO (2)

ECON DIV (2)

G-1

HQ COMDT

(Received 1345 Hrs. notified immediately and arrangements for transport made.)

10712

4614

SECRET

RESTRICTED 1551

PENINSULAR BASE SIGNAL
SIGNAL MESSAGE CENTER

23 JANUARY 1944

RESTRICTED

PRIORITY

CG PBS FOR FENCE FOR FARGO

FLAMBO FOR HENDERSON

SIGNED CINC

222028A

231310A

41710

FMMGS

FURTHER TO OUR 40600 OF 20TH JANUARY. RECEIPT OF SPOFFORD LETTER OF 17 JAN INDICATING ESSENTIALITY OF LONG FLAME GAS COAL PRECLUDES USE OF SARDINIAN COAL. ALLOCATIO OF DODA ASH THEREFORE WITHDRAWN PENDING ALLOCATION OF SUITABLE COAL AND PORT ACCEPANCE. YOU WILL COORDINATE THIS WITH QUARTERMASTER AND FLAMBO AND ADVISE THIS HEADQUARTERS

PBS DIST.

Action AMG Hq
Info MGS Adv
QM
G-4
Trans
Sec
CG

AS DIST

(ACTION) Econ Div (2)

(INFO) DCGAO (2)

RESTRICTED

4619

10747

313 163

FARGO 8 Jan. 1944

RESTRICTED 10050 Driffield-White

ROUTINE

I.B.S.

_____ ROADWORK AND HIGHWAY CONSTRUCTION IS SUBJECT PD PENCE PAREN FARGO PAREN TO IBS FOR SEARS FOR AMG FOR REGION ONE FOR POLETTI FROM SPOFFORD CITE FARGO ONE SIX THREE PD CAN YOU RELEASE BOLICK LT COL FOR ASSIGNMENT PUBLIC WORKS SUBCOMMISSION FOR SPECIAL WORK PD BOYD MAJOR COULD BE APPOINTED POST REGION ONE THUS VACANT PD IF ABOVE BOLICK SHOULD PREPARE TO REPORT HERE EARLIEST

J. F. NICKEL
Lt. Col., AGD
Adjt. General

4617

HEADQUARTERS ALLIED CONTROL COMMISSION EWS/mms

APO 394

In reply
refer to: CS/6/4

4 January 1944

SUBJECT: State Railway Employee Spinella.

TO : Headquarters A.M.G.

1. Reference is made to attached copy of letter with translation, 432/1.4/3.1/Segr. from the Under-Secretary of State for Railroads, Italian government, dated 30 December 1943 relative to above subject.

2. Since Vibo Valentia is located in A.M.G. territory, this matter is being referred to your Headquarters for necessary action.

3. It is suggested that it would be desirable to comply with General G. di Raimondo's request if the circumstances will permit. In order that we may inform the Italian government with respect to action taken, request this Headquarters be informed.

For the Deputy President, Allied Control Commission:

ROBERT E. DOE
Major, A.G.D.
Secretary of the Commission

1 Incl.
Copy of Ltr 432/1.4/3.1/Segr
with translation.

4616

COPY

MINISTERO DELLE COMUNICAZIONI

SOTTOSEGRETARIATO DI STATO

PER LE FERROVIE - MOTORIZZAZIONE CIVILE E TRASPORTI IN CONCESSIONE

Prot. N 432 /1.4/3.1/Segr.

Brindisi, li 30 of dec. 1943

CONCERN: State-Railway employee Spinella.-

TO: Allied Control Commission BRINDISI

I am honoured to inform you about what follows.

On the 23rd of September last the Civil Commissioner of the British Empire in Vibo Valentia appointed as deputy-commissioner of Pizzo Mr. Francesco Spinella, who is a dependant of the State Railway Commercial and traffic section of Tropea.

The provisions now in force on the matter don't let the dependant officials to be detached from the railway service and appointed either to special charges or to other administrations.

It may be mentioned that Mr. Spinella gets still his ordinary pay from the State railway Department, with consequent burden for the budget.

I beg, therefore, the A.C.C. to examine the opportunity either of living Mr. Spinella go back to his normal activity or of freeing the railway administration from an useless financial expense.

THE UNDERSECRETARY OF STATE
sig. Gen. G. di Raimondo

4615

Ref/CS/6/4 1st Ind. AT/ard

Headquarters, Allied Military Government, APO 512. 11 January 1944

To: R.C.A.C., Region II

1. Reference the attached copy of letter (translation) from the Italian Under-Secretary of State for Railroads. It is not clear whether Mr. Spinella's transfer was made by one of your officials, but it is considered that unless there are urgent reasons to the contrary, Mr. Spinella should be returned to his original railway duties at Tropea.

2. Your comments will be appreciated.

/ Charles P. Spofford Capt
CHARLES P. SPOFFORD
Colonel, G.S.C.
D.C.C.A.O., AMG. HQ.

4614

HEADQUARTERS
ALLIED MILITARY GOVERNMENT
ACTION SHEET

AJ

5 JAN
Date

Suspense

FROM		TO
X	C.O., A.M.G.	✓
	C. of Staff	
	D.C. of Staff for (O&SI)	
	D.C. of Staff Admin.	
✓	Industrial Plan	X
	Mil. Sec.	
	Pol. Sec.	
	Econ & Admin Sec.	
	Communications Sec.	
	Economic Director	
	Administrative Dir.	
	Executive Off. Admin.	
	G-1	
	G-4	
	Adjutant General	
	Personnel	
	Publications	
	Miscellaneous	
	Supply Officer	
	Billeting Officer	
	Transportation Off.	
	Hq Commandant	
	Camp Commandant	
	Message Center	
	Sub-Commission on;	

For:		
	Signature	
	Recommendation	
	Information	✓
	Approval or Disapp.	
	Appropriate Action	
	Investig. & Report	
	File	
✓	Return ~~to Cent. Files~~	4613
	Transmission	

Remarks:
I see no advantage in moving this job for Italy only to AFHQ. Sec. Gray covers all occupied territories, incl. Africa. Advantage lies in covering all AGC, ANG, AMG 15th Army Gp, and others areas artificially separating administrative jurisdiction. Conflict not between AFLE(I)B and AGC, but between ANG-AGC-AMG 15th Army Gp, etc.
BMR

COPY

HEADQUARTERS ALLIED CONTROL COMMISSION
APO 394

MDT/hjp

In reply refer to:
821.24

3 January 1944

MEMORANDUM FOR: Mister Grady

General Joyce would like to have your comments upon the proposal attached hereto. Will you kindly discuss the matter with General Robertson and Colonel Crowdon and recommend the position General Joyce should take on the proposal?

For the Deputy President, Allied Control Commission:

MAXWELL D. TAYLOR
Brigadier General, USA

1 Incl:
Ltr. AFHQ Adv Adm Sch
59/8 Q 26 Dec 43

4612

C O P Y

SUBJECT:- Electric Power Service

AFHQ Adv Adm Echelon
CMF
59/8 G

AFHQ
Allied Control Commission (for Maj-Gen. Joyce)

26 Dec 43

Copy to:- CG PBS
DDW

1. There has been some doubt as to the relative responsibilities of Allied Control Commission and of the Local Resources Board in regard to the rehabilitation and distribution of electric power.

2. The electric power system of ITALY resembles to some extent the railway system in that any organization for its repair and development must cover the country as a whole, and be subject to centralized control. Any doubt as to the relative responsibilities of seperate organisations is most unaesirable.

3. A proposal has now been put forward by Colonel James P. Crowdon of the Electrical Sub-Commission of the ACC advocating the establishment of an Electric Power Service operating under this HQ. Colonel Crowdon proposes that he, himself, should be the head of this Service and that an establishment be drawn up, integrated US and British, with clerical staff and transport. This staff can only partly be found from the existing staff of the Electrical Sub-Commission ACC. The establishment of this Service will place Colonel Crowdon in a similar position to that occupied by Brig-Gen. Carl Gray as head of the Military Railway Service.

4. The responsibilities of this Electric Power Service would comprise the repair and development of Italian state and privately owned electric power systems up to and including local sub-stations. From this point responsibilities would remain with the Area or Base Section Commander concerned. All questions regarding the allocation of electricpower as between civil and military users or between the various military services, Naval etc., would be decided by the Electric Power Committee of the Local Resources Board.

5. I consider that this proposal has much to commend it. I should be glad to know whether it is approved in principle by AFHQ and also whether Maj-Gen. Joyce would be prepared to accept it. It would be understood that at a later stage, as the advance into ITALY progresses, the matter could be reviewed in case it should then seem desirable for

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4611

6. If approval in principle is given I will have the details worked out and keep you informed on progress.

/s/ - - ROBERTSON

Major General.
Deputy Chief Administrative Officer

813.

HEADQUARTERS
ALLIED MILITARY GOVERNMENT
INDUSTRY & COMMERCE SUB-COMMISSION
APO 394

AMG/513/IC

30 December 1943

SUBJECT: Requisitions Region I

TO : [redacted]

1. Reference MGS 400.312-1 (1) dated 13 Nov. 43, dealing with requisition for 500 tons reinforcing steel for Region I.

2. Public Works Sub-Commission now requests that this requisition be cancelled.

For the Commanding Officer:

W. P. MAHS
Colonel,
Acting Director, Industry
and Commerce Sub-Commission.

DISTRIBUTION:

[redacted]
HQ Region I
Pub. Wks. Sub-Commission, Hq AMG.

4610

HEADQUARTERS
ALLIED MILITARY GOVERNMENT
PUBLIC WORKS AND UTILITIES SUB-COMMISSION AG/LAJ/sl

23 December 1943

SUBJECT: Reconstruction on Stigliano-Craco Highway.

TO : Lt. Colonel G.H. McCAFFREY, RCAO, Region II,
A.P.O. 334, U.S. Army.

1. Your request for authority to reconstruct a portion of the Stigliano-Craco Highway has been referred to this Sub-Commission. In order to permit proper consideration of your request, the following information is needed:

a. Is this on a principal state road, or a provincial secondary road?
b. Is the traffic heavy on this road?
c. What type of construction is proposed for the bridge?
d. What are the approximate quantities of materials to be used in the bridge, such as cubic meters of stone masonry, cubic meters concrete, tons of cement, quantity of steel (if any) etc.?
e. What type of road pavement is proposed?
f. What are the quantities involved?
g. Are all the above materials available locally, or do they have to be brought from other points—if so, from where?
h. Is all transportation available locally for this project?
i. What is the estimated time for constructing this project?
j. Have your engineers received this project and are they satisfied that the proposed plan offers the best solution of the problem?

-1-

To Lieut H.G. Arnold

4609

RECONSTRUCTION ON STIGLIANO-CRACO HIGHWAY: Cont'd.

2. In submitting to us any future similar requests, it will be appreciated if such information accompanies the request so that it may receive prompt consideration.

L. A. JENNY
Lt. Colonel, C.E.
Actg Dir P.W. & U. Sub Com

Copy to:

Chief HQ. AMG
Econ. Dir.

4608

313

DC 1 S(0.SI)

File : RTC 400.274 Ist Ind CPB/er
ALLIED MILITARY GOVERNMENT, SICILY REGION HEADQUARTERS,
T.C.U.P.W. & MINING DIV. 9 December 1943 (8/12/43)

TO : Lt.Col. Charles Poletti, R.C.A.O.

1. Something along this line would be of very great value, and I would be willing to see it submitted to higher Headquarters for their consideration. Each officer, however so attached should be provided with the following personnel and equipment.

1 - Sgt. - - - - Clerk
1 - T-5 - - - - Interpreter
1 - Pfc.- - - - chauffer
1 - 1/4 T 4x4 -
1 - Field desk
1 - Typewriter, portable.

C.P.Bolick.
C.P.BOLICK
Lt.Col.,F.A.,
Chief, T.C.U.P.W.
& Mining Div.

File: REO 400.274 2nd Ind.
ALLIED MILITARY GOVERNMENT Sicily Region Headquarters.
21/12/43

TO: C.S.O., A.M.G. Headquarters.

Maj. C.F. Bowman, Head of Region 1 Utilities Section, has given careful thought to the matter of the use of A.M.G. technical personnel in any future operations.

His previous experience with 7th Army Hq qualifies him to speak on this subject, and I am forwarding his suggestions, which in my opinion have much to commend them.

One of the difficulties in the early stages of an operation is to know who to contact and where, and to know that A.M.G. technical officers are in the area of operations would be a great boon.

Charles Poletti
CHARLES POLETTI
Lt. Colonel
Regional Civil Affairs Officer

4647
7667

ALLIED MILITARY GOVERNMENT
SICILY REGION HEADQUARTERS
APO 394

CFB/el

File : RTC 400.274

8 December 1943

SUBJECT : Suggestion on Plans, Future Operations.

TO : Lt. Col. Charles Poletti, R.C.A.O.

1 . It is recommended that in any future operations, at least a part of the technical personnel of A.M.G. who are to supervise utilities, communications, transportation, etc., be attached to the appropriate sections of the Hq. of the invasion army in excess of the army Hq. T/O. Upon release of the control of each item, the corresponding A.M.G. personnel should then be attached to the organization assuming control.

2 . Advantages would be:

a . More effective control, since to exercise effective control the supervisor must have extensive knowledge of the following:

(1) Complicated and extensive physical plant and its capabilities and limitations.

(2) Civilian personnel and their political and technical reliability.

(3) Supply problems, including major repairs extending over considerable time.

(4) Military and minimum industrial requirements of the region.

b . Economy of personnel, e.g.: Under normal procedure in Sicily, the electrical engineer for the Seventh Army lost his major function when the electricity control passed to I.B.S., and the electrical engineer for I.B.S. lost his major function with transfer of control to A.M.G..

c . Continuity of contact with the civilian personnel being supervised, eliminating confusion in the minds of the civilians as to source of their orders.

4606

3 . Types of installations for which this procedure is recommended, with date of reversion to A.M.G. control dependent on agreement between army and A.M.G. in each case:

a . Electric power companies.
b . Water companies: aqueduct systems.
c . Public works: sewers, roads, bridges.
d . Transportation: by rail, bus, and water.
e . Special industries: mines, and chemical and other plants where an early contact and control would preserve the property intact and greatly decrease the delay in production.

4 . This recommendation is based upon personal experience, the undersigned having been transferred from Hq. Seventh Army to A.M.G., with the benefits as given above. The recommendation is made for transmission to proper authority, if it is felt warranted.

Clair F. Bowman

CLAIR F. BOWMAN
Major, C.E.,
Region Utilities Officer

1-266

ALLIED FORCE HEADQUARTERS

Military Government Section

6th December, 1943

From Colonel A. T. Maxwell

Dear Charles

This is a note to introduce to you Mr. A. G. Coulson who has recently arrived from England and is to be attached to the Mining Division of the Allied Control Commission. He is at the moment working very closely with Brigadier Norman-Smith who is on the strength of the Coal Section of the Quartermaster Section of A.F.H.Q., and will be working very closely with the Allied Control Commission as far as allocation of coal as between civilian and military requirements and co-ordinating demands.

I understand that Coulson is to go to Naples within the next day or two and will then be going to Palermo and then paying a visit to Sardinia.

Yours ever,
Terence Maxwell

Colonel Charles Spofford,
H.Q., A.M.G.,
C.M.F.

4604

C.of.S. 1-267
5629
7 DEC 1943

HEADQUARTERS
ALLIED MILITARY GOVERNMENT
APO 512

2 December 1943

SUBJECT: Control of Mining Activities - Italy.

TO : Military Government Section AFHQ.

1. After due consideration it has been decided to operate the newly constituted Mines Section as a section of the Public Works and Utilities Sub-Commission (Economic Directorate) instead of as a section of the Industry and Commerce Sub-Commission as originally suggested.

2. The above decision has been influenced largely by the fact that the Italian Administration is similarly constituted.

3. May the above be approved.

For the Commanding General:

for E. CUNTERBOCK,
Brigadier
Actg. Chief of Staff

1st Ind. HP/thh

Military Government Section, Allied Force Headquarters, 8 December 1943.

TO: Headquarters AMG, APO 512

1. Approved.

For the Chief of Section:

Henry Parkman Jr.
HENRY PARKMAN, Jr.
Lt. Colonel.

4603

LAJ/ecb

HEADQUARTERS
ALLIED CONTROL COMMISSION
Public Works and Utilities Sub-Commission

16 November 1943.

AC/050/PWU

Subject: Coordination of Work in Italy.

To: Economic Director.

1. I have made a careful study of the various problems with which this Sub-Commission will be confronted when we get to the mainland of Italy and on which we must have coordinated activity in advance of our taking over any region. The most important of these is the question of restoration of electrical installations.

2. Already in Sicily it was recognised that the restoration of electric installations was a headquarters function and could not be left to the provinces to solve, because of the overlapping and integration of transmission systems. In Italy the problem is magnified manyfold. A Power station serving our territory may be in German hands, or it may be in the 15th Army area, or vice versa.

3. As I see it now the only proper solution to the problem is the establishment within the 15th Army area of a separate section of the Electric Utilities division of this Sub-Commission whose function it wil be to take charge of the electric power and transmission systems rehabilitation in that area and south to a point where the remaining problems can be handled through Italian agencies. To be successful the electric utility problem cannot be solved piecemeal. It must be handled by one agency whose task it will be to ultimately restore these facilities to the civil authorities and that is our responsibility. The most important phase of that whole problem is handled within the 15th Army area and this must be closely correlated with what is to follow. The problems which will confront us, acting as the A.M.G. or A.C.C., are tail end problems of restoration and to a considerable extent financial, operating or labour problems and essential phases of limited long range programs.

4. It is, therefore, requested that steps be taken promptly along these lines and that I be permitted to establish such a section of this Sub-Commission within the 15th Army area, to be headed by a competent senior officer subject to directives from this office, and who will make regular reports to us on all activities of that section.

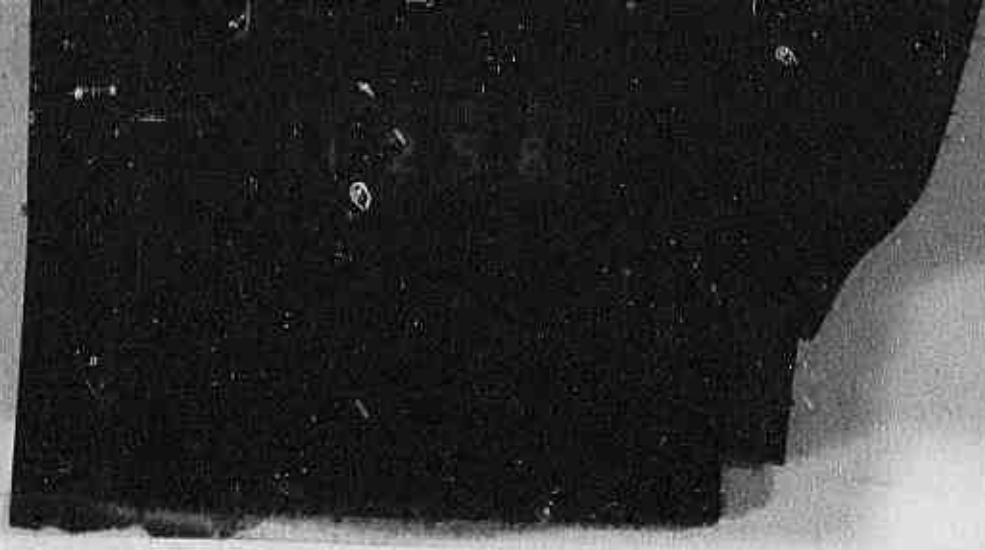
5. In the meantime, no matter what setup may be established, I consider it of utmost importance to send some experts to Italy to make a survey of the electrical installations in Regions 2 and 3, to ascertain the type and magnitude of destruction so that adequate plans

may be made for essential restoration work to be done by HQ- A.M.G. Authority is hereby requested to send electrical experts on such a mission.

6. Because of the A.M.G. division into 2 groups, A.M.G. 15th Army and HQ. A.M.G. we are further confronted with the problem of being properly advised on what is going on within the 15th Army area insofar as public works, water, sewers, highways, etc. are concerned so that we may also be prepared to carry on these functions when any new territory is added to the area to be controlled by us. Authority is hereby requested to send a competent senior officer with assistants to the 15th Army area to act as our liaison officer on these matters. This officer would have no authority to direct any work, but only to advise insofar as our policies are concerned and to report to us on what is going on.

L. A. JENNY,
Lt-Col. C. M. R.
Acting Director.

4601



HEADQUARTERS
ALLIED MILITARY GOVERNMENT
APO 512

27 November 1943.

SUBJECT: Letters Re Electric Power Mission

TO : Colonel J. P. Growdon, Chief Electric Power Mission

1. There are attached herewith two (2) copies of letters regarding the above subject sent to Major General C. Clark and Colonel Robert Sears under date of 26 November 1943 and signed by Brigadier General FRANK McSHERRY:

(for) CHARLES M. SPOFFORD,
Colonel, G.S.C.,
Deputy Chief of Staff
(G & SI)

4594

P.A. Coles

KC/ecn

MINISTRY OF PUBLIC WORKS

Present Situation

I GENERAL.

On 25 Nov 43 I received orders to represent the PW & U Sub-Commission at a Meeting that afternoon with the Technical Minister to the Badoglio Government, and was instructed to ascertain the position with regard to the P.W. Ministry and further to obtain an estimate of the time which would be needed for its inception.

I contacted the Minister for Public Works, His Excellency Signor De Caro, who is at present residing in the building of the Society which owns the Aqueduct at Bari and arrenged a meeting for 1000 hrs on 26 Nov 43 at the Prefecture.

II RESULT OF MEETING.

Accompanied by Commander Lovatelli, Italian Navy, as Interpreter I met Signor De Caro as arranged.

He told me that he had only assumed office about two days ago and had little personal detailed knowledge of the Provinces. I informed him that our discussion at this stage could only be in the broadest terms and it was my wish to discuss particularly his general organization and the period which would be necessary for it to become effective in SORRENTO.

The following information was obtained:-

(i) The move to Sorrento

His Excellency Signor Reale, Co-ordinating Minister, is making all arrangements. Office accomodation and supplies would be found locally and there would be little Transportation difficulty, but the date of the release of accomodation by the RAF would be a deciding factor.

(ii) Staff Organization

Signor De Caro would have as his Private Secretaries Lt. Corelli, Italian Air Force, and D[illegible] Del Basse.

The Technical side would be under Signor Tizzano as Director General. With five Engineers at present working in the four provinces of Bari, Brindisi, Lecce & Taranto, who would cover the various branches.

The Administrative side would be drawn from the present Naples Administration, and his Administrator Director would

which owns the Aqueduct at Bari and arranged a meeting for 1000 hrs on 26 Nov 43 at the Prefecture.

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The Administrative side would be drawn from the present Naples Administration, and his Administrator Director would arrive in Brindisi ~~to-morrow~~ on Monday evening ~~27th~~ 29th and could be seen the following day.

In addition there would be a nucleus of clerical staff, stenographers, typists etc.

All the above are immediately available and Signor De Caro informs me that his is the first Ministry to complete the formation of an initially complete staff.

(iii) Functions covered

The Ministry will have control of the following branches of engineering: 1609

(a) Highways & Bridges

(b) Water (through the Societies)
(c) Rivers and Harbours
(d) Buildings
(e) Mines

✕ Electrical Engineering will be under separate Government Control.

(iv) Availability of Experts

Signor De Caro is satisfied that he has an adequate technical staff to cover all the functions under his control and the same can be said of the Provincial and other private organizations through which his Ministry will operate. He has no personal knowledge of Sicily & Calabria, but anticipates no difficulty.

(v) Meterial position

In Signor Caro's opinion this is bad and will be worse in the present forward areas.

I informed him that we were anxious to help in any possible way, but that war needs made a huge demand on our shipping resources and that the bulk of his materials would have to be found locally and that salvage would be a very important consideration.

(vi) Completion of preliminary organization

Signor De Caro estimates that he will be ready to function Six or Seven days after arrival in SORRENTO.

III CONCLUSION.

I was able to establish cordial relations with Signor De Caro who impressed me as an able administrator who was anxious to cooperate with us in any possible way.

Having regard to the preliminary work already completed I see 454 H no reason to doubt the accuracy of his estimates.

H Chilson
Major R.A.

for P.W. & U Sub Commission

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H Chilson.
Major R.A.
for P/W & U Sub Commission

Brindisi
26 Nov 43.

※ NOTE: Since the above it has been ascertained that Electricity will be controlled by this Ministry.

H Chilson.

313.109

HEADQUARTERS
ALLIED MILITARY GOVERNMENT
APO 512

18 November 1943

SUBJECT: Establishment of Technical Mission on Rehabilitation of Hydroelectric Facilities

TO : Col. Crowdon, c/o Public Works & Utilities Subcommission

1. Enclosed is a draft order creating a special Technical Mission on hydroelectric facilities which we have discussed in the past few days. Your comments will be appreciated.

2. Will you communicate with Col. Adams, CSO Economic Directorate, as early this afternoon as possible.

By command of Brigadier General McSHERRY:

E. A. L. GUTTENBOCK
Brigadier
Acting Chief of Staff

Encl.

Copy to: Col. Adams

4597

313.109

HEADQUARTERS
ALLIED MILITARY GOVERNMENT
APO 512

18 November 1943

SUBJECT: Establishment of Technical Mission on Rehabilitation of Hydroelectric Facilities

TO : All Concerned

1. There will be created within this headquarters a special Technical Mission to be known as the Hydroelectric Facilities Mission. The functions of this Technical Mission will be to survey hydroelectric generating and transmission facilities in all occupied territory and to arrange, with the appropriate authorities, for the rehabilitation and repair of such facilities.

2. The responsibility of this Technical Mission will extend only to generating and transmission facilities. It will not extend to facilities for local distribution, which will continue to be handled by the Public Works & Utilities Subcommission. The activities of the Mission will be closely coordinated with those of the Public Works & Utilities Subcommission.

3. The Mission will perform its functions not only in territory subject to AMG HQ but will also, with the consent of the appropriate authorities, perform such functions in territory of 15 Army Group, and in conjunction with the Engineers of the 5th and 8th Armies.

4. The Mission will, for purposes of operation, be responsible directly to the Economic Director for AMG HQ. For purposes of AMG administration it will be attached to the Economic Directorate.

5. The Mission is provisional and its establishment is to be regarded as temporary.

6. Colonel Jesse P. Crowdon is named Chief of the Technical Mission on hydroelectric rehabilitation.

By command of Brigadier General McSHERRY:

K. A. L. GUNTERBOCK
Brigadier
Acting Chief of Staff

P.A. PWdU 313

17 Nov 43.

Subject: Palermo Water Supply.

To: Lt-Col Jenny.

4596

1. During an inspection of Gabriele Springs which is an important source of supply for the higher levels of Palermo, it was alleged by the water company employees and by their engineer and director Signore Vigevani that four American soldiers attached to an anti-aircraft unit forced their way into the walled off grounds of the Springs on Thursday November 9 for the purpose of placing bottles of milk to cool off in the cold waters of the Springs. An off limits sign was observed in place on the gate.

2. It is also alleged by S. Vigevani that the clockwork of the Venturi meter registering device located in a deep manhole outside the grounds of the Springs for measuring the flow from the springs to the city were removed last August by American soldiers. The 62nd Coast Artillery, Anti-aircraft unit is located in the immediate vicinity of the Venturi meter manhole. They have been there since last August. Company A, 54th QM, 7A is located nearby also.

J. F. Laboon

Lt-Col J.F. LABOON.

Col. Sprafford.

I think this matter should be called to the attention of military authorities. It is not only a violation of military rules, but the question of public health is involved as there are springs serving the Palermo water supply

R.A. Jenny 11/17/43

Lt Col. C.E.