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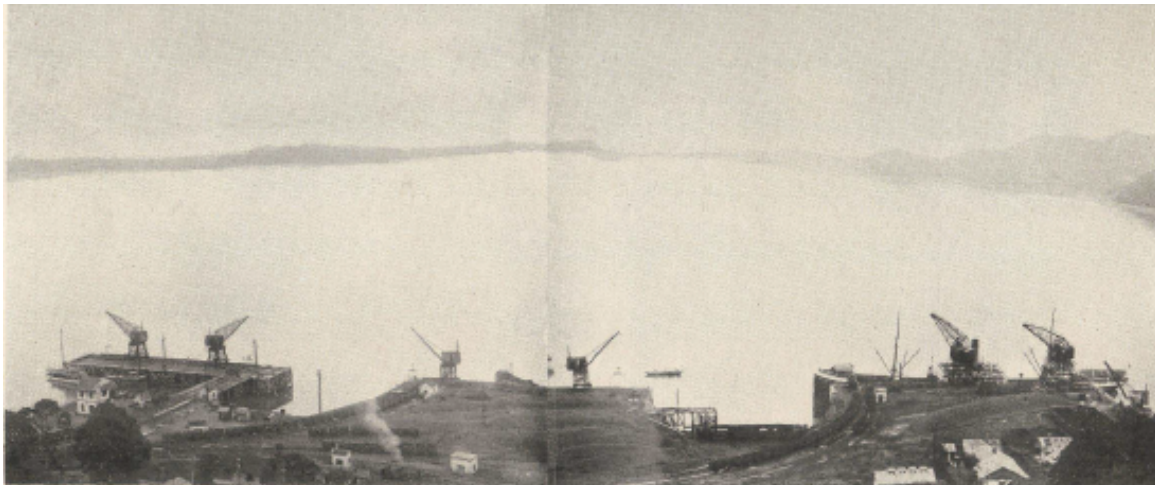
Société française des charbonnages
du Tonkin
Head Office : Paris — Sales Department : Haiphong
Agencies in Japan, China, Manila, Indo-China,
Canada, USA, Straits Settlements, Siam, France.

THE HONGAY COAL MINES OF FRENCH- INDO-CHINA

French Indo-China is becoming every day a more important coal exporter, in as much as with the small deposits in Korea and Shantung, she is the principal source of anthracite fuel in the Far East. The deposits are practically all situated in Tonkin, in the vicinity of the picturesque and well known Baie d'Along.

The Chinese in 1865, were the first to work the coalfield. European prospectors then came (Fuchs-Saladin in 1882 and Sarran in 1886) and the coal fields of Along Bay were conceded and a Company was formed. For lack of markets the early days were hard, but since 1900 success has been assured to the Company working the Mines under the name of "Société française des charbonnages du Tonkin". The capital is only F 38,400,000 divided into 153,600 shares of a nominal value of F 250. The Head Office is in Paris, 64, rue de la Chaussée-d'Antin and the Directors are Messrs. Henri Théliér (Chairman), H. Deschamps, Fernand Monvoisin, Christian de Monplanet, Albert Luc, Raymond Ferrant, Fernand Carrère, Robert Thoumyre, Henri de Monplanet and Henri Girot. The General Manager is Mr. A. Marcheix, the Commercial Manager Mr. E. Bougon (Haiphong), the Technical Manager Mr. Bonnevey (Hongay). There are now employed at the Mines over 300 Europeans, mostly French people, and over 30,000 coolies, practically all Tonkinese.

The Mines are located in Tonkin, the province of Quang Yen and are situated near Along Bay and Tsi Long Bay, in the extreme north of the Gulf of Tonking. The collieries can be reached via Haiphong either by motor-car or steamer, the distance being 35 miles. Frequent services of steamers connect Haiphong with Hongkong, Saigon, Singapore.



Port of Hongay

[3] The mining area extends over 61,700 acres, the full property of the Société française des charbonnages du Tonkin, the principal centers of which are Hongay and Campha.

Including merchants, wood cutters, farmers, boat people, etc. living on the Company's property, over 60,000 people are under the jurisdiction of the Company.

The output has increased regularly as follows:

194,441 tons in 1900

720,000 tons in 1921
1,450,000 tons in 1928

GEOLOGY. — The coal seams of Hongay are of Rhetian formation, resting on an important foundation of calcine, to which belong the rocky islands of the Bay d'Along and Fai-Tsi-Long. The coal is found in a large number of seams of various thicknesses from 16/19 feet to 260 feet.

SHORT DESCRIPTION OF MINING OPERATIONS. — Two distinct methods of mining have been developed: the Open Cut and Underground Mining. When the thickness of the upper alluvium ground is not too big in proportion to the thickness of the coal seams, the Open Cut method is used.

In each open cut, the working levels are disposed in a number of straight steps from 16 to 19 feet high, the general incline being maintained at 45° in order to prevent landslides.

The three open cuts of the Hatou area have 20 to 24 such steps whose lengths are from 650 to 980 feet.

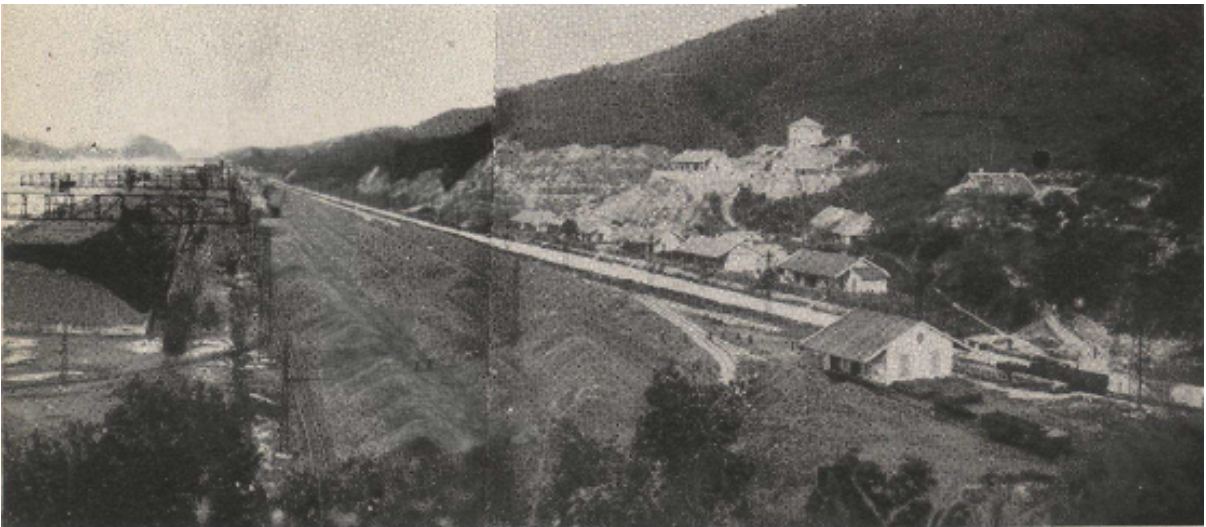
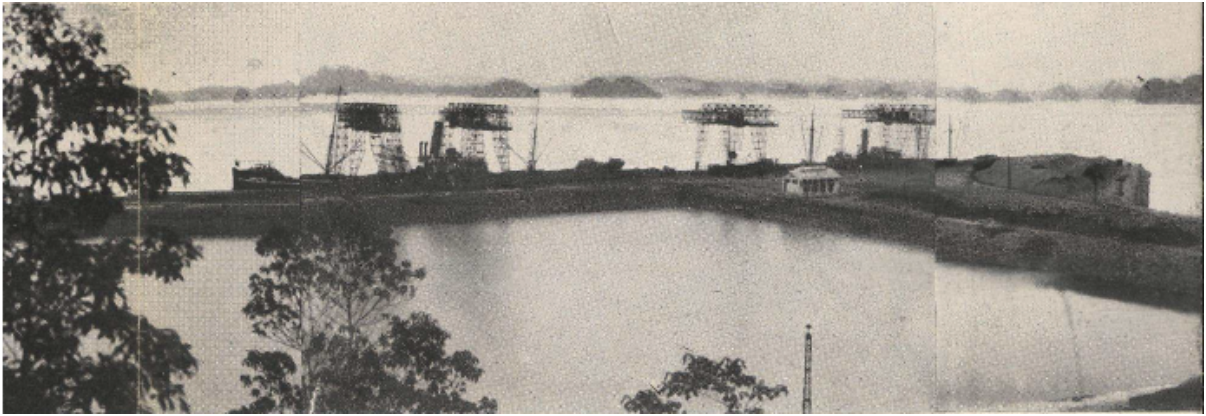
The three open cuts of the Campha area extend over a ground of more than 3,300 feet in length and 420 feet high, the working levels being distributed on 26 steps.

At the same time as the seam of coal is being cut one must remove the overlying alluvium ground. One must also remove the numerous shale layers, which are found amidst the coal veins in the seam itself.

The coal and the alluvium ground dug separately (coal by hand, alluvium by steam and electric shovels) are loaded on small cars, rolling on Decauville rails running on each step.



Working on a Seam



General view of Campha Port showing quays, stocks and handling equipment

[5] These small cars are taken to a convenient level by way of inclined haulage ways. Those loaded with the alluvium ground are directed towards special dumping places, those loaded with coal are directed towards places where the coal is gathered. From these places the coal is loaded into cars of 10/20 tons capacity, which carry it to the screening plant.

THE UNDERGROUND MINING. — Is used in other parts where coal seams do not justify the Open Out method. The seams worked in this way are 16 to 26 feet thick. They are generally worked by horizontal cuts of about six feet. As the cover of the seams is of a non-resistant soil, the galleries, once worked, must be refilled.

SCREENING PLANT. — From the Open Cuts or Underground Mines the coal is carried to a screening plant. There are two of them, situated respectively at the two loading ports of Hongay and Campha. An electric railway is running between the Mines and the screening plant at Campha.

These screening plants come from the very well-known firms of Dalbouze - Humboldt and Evens - Coppee.

The coal is screened in four classes :

Lump	over 50 m/m
Small Lump	from 30 m/m to 50 m/m
Nuts	from 6 m/m to 28 m/m
Ordinary dust	from 0 m/m to 30 m/m
Fine dust	from 0 m/m to 10 m/m

The Lump coal and Small Lump coal are sorted on running belts and stones and shales are picked up and thrown away. The nuts are worked through a washing plant, which produces nuts from 6 to 12 m/m and 15 to 28 m/m.

PATENT FUEL FACTORY. — The fine dust of the Hongay Coal is mixed in certain proportions with bituminous coal and pitch. Briquettes and eggs are manufactured with this mixture by five Biatrix Leflaive presses and two Middleton presses, for briquettes, and three special presses for eggs, the total daily production being 800 tons. Furthermore, the Hongay Mines are largely interested in and control a factory [7] of patent fuel located at Haiphong and known as " Charbons et Agglomérés de Haiphong, Ltd ".



Screening Plant, Campha

COAX, YARDS. — From the screening plants and the washing plants, the coal is loaded on cars, which are directed towards a system of tracks running through the

stock yards. At Campha Port, the stock yard is half a mile long and equipped with three electric overhead cranes of 131 feet between supports which can either put the coal in stock by lifting and dumping the cars or take it out again from heaps by means of electrically driven coal grabs. They have been specially laid up so as to insure easy and quick movement of cars, haulage being installed everywhere.

SHIPMENTS. — The totality of the coal disposed of by the collieries is loaded on steamers or lighters at one of their two ports of Hongay or Port Campha.

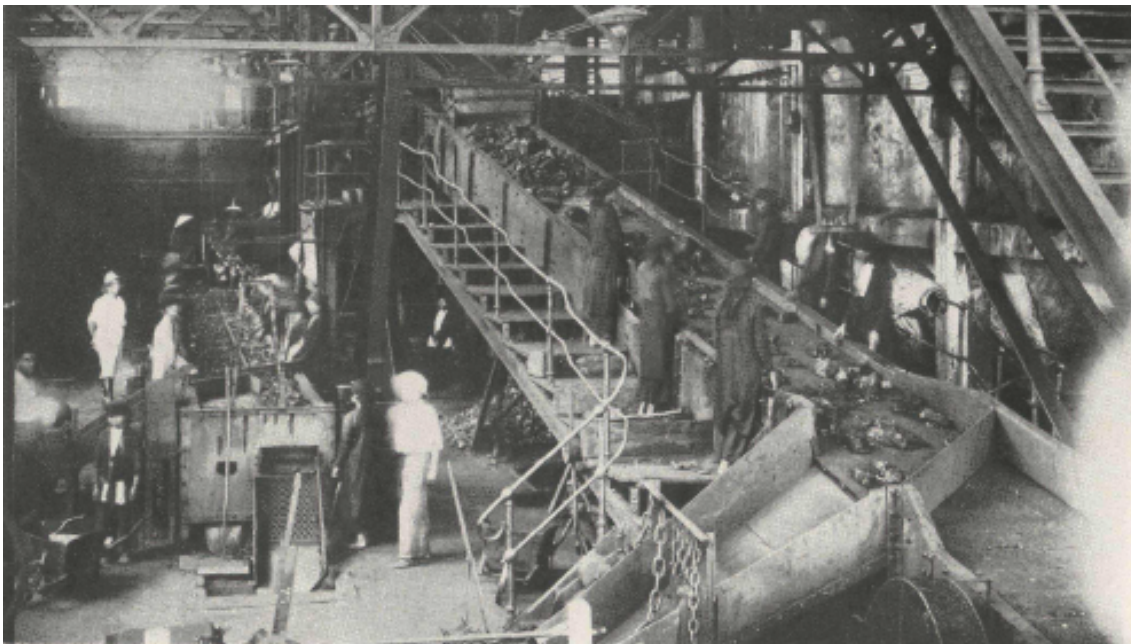
At Hongay there are three quays of 229, 246, and 262 feet respectively. The loading into steamers is done by six cranes of about 80 T. per hour efficiency each. The upper part of the cars shaped as a box is lifted by these cranes, brought over into the hatches of the steamers and overturned.

At Campha Port, the loading pier has a length of 984 feet, and is equipped with four electric driven overhead cranes each of a loading capacity of 120 tons per hour. All cars at Campha are electrically hauled.

These two ports are accessible at any time to steamers of 5,000 to 8,000 tons loading capacity, the depth of water being from 26 to 29 feet.

ELECTRIC RAILWAYS. — In addition to the side lines that are worked electrically, there is at present a main Track line of seven miles (between Campha Port and Campha Mines). A similar track line is now under construction between Campha Port and the Mines of Mong-Dzuong, a distance of 3.5 miles and will be opened to traffic in 1933. Electric locomotives weighing 30 tons and equipped with four motors of 110 h.p., 750 volts, haul trains of 300 tons at a speed of 22 miles per hour.

Cars are " automatic side dumpers " each of 10 tons effective capacity.



Screening Plant. Interior view

[9] POWER PLANT. — In order to comply with the electricity requirements of the mines the Ste des charbonnages du Tonkin, has built a Central Power station of 4,000 kw., which will soon be increased to 8,000 kw.

This Power station entirely of concrete, is equipped with four turbo-alternators of the Ste alsacienne de constructions mécaniques of Belfort, operating at 3,000 revolutions

per minute. Steam is produced by seven Babcock and Wilcox boilers each of 2,359 sq. feet, heating area, with automatic grates and superheaters.

The alternators produce 3,000 volts triphase current which is raised by transformers up to 30,000 volts, tension of transportation all over the Mines.

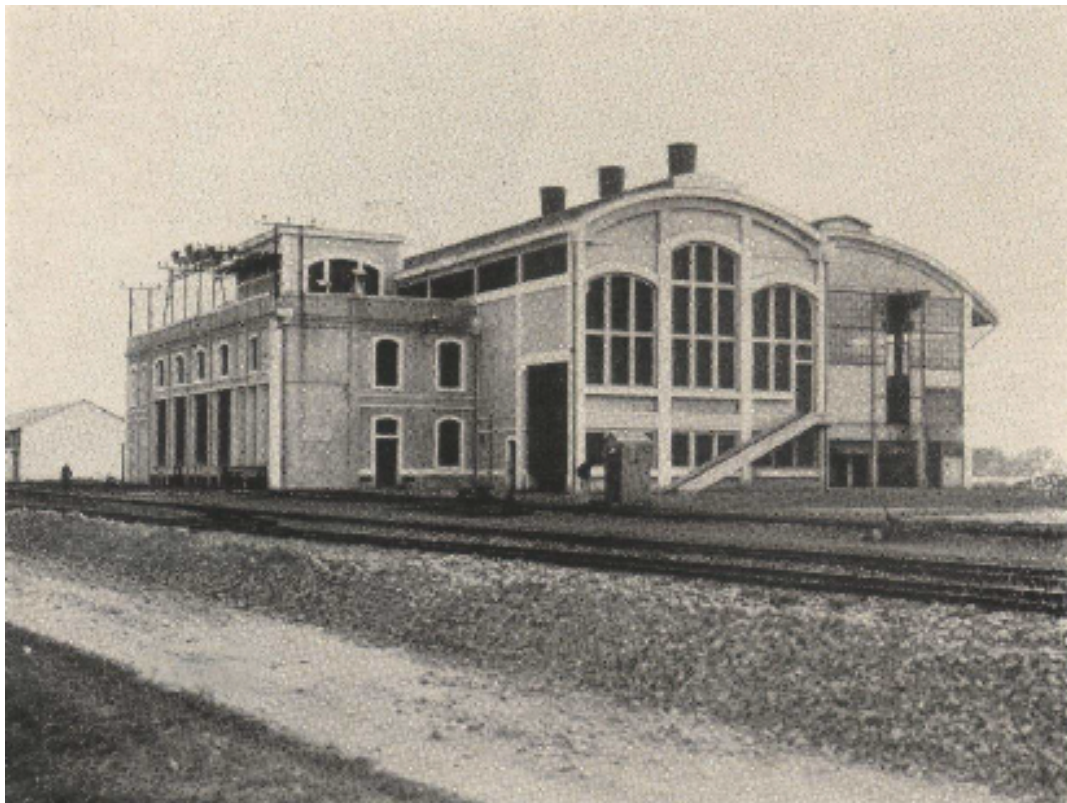
In three sub-stations, the current is reduced to 3,000 volts. At places of consumption other transformers step down the current to 110 volts. All units have been especially designed with interchangeable parts.

Continuous 750 volts current is supplied to the main railway track by special stations situated at Campha port, and at Campha mines.

SOCIAL AMENITIES. — The Company has built for their native workmen residents or not, many villages on most modern plans, besides improving the old ones. In all of these localities the latest system of drains and water distribution have been established. The public health is much cared for and important works are continually made for its improvement. Much attention has been paid to public buildings such as markets, etc. Two hospitals accommodating 400 beds are kept by the Company with corresponding medical service. Churches, schools, sport grounds, clubs have been erected by the Company.

Quality of Hongay Coal

GENERAL PROPERTIES. — Hongay Coal is an anthracitous fuel which contains a high percentage of fixed carbon and low percentage of volatile matter. The ash is infusible at the temperature of boiler furnaces, does not leave any clinkers, [11] and does not choke up the grates.



Power Station. Exterior view

Its low percentage of sulphur as well as its high percentage of fixed carbon specially recommends it for metallurgical purposes. The grates, pipes, boiler tubes and boiler surfaces do not corrode. Hongay coal burns entirely and without smoke, and can be easily compared to the best lean short flame anthracitous Welsh coal. Its very high calorific power is taken advantage of to increase the efficiency of coals with which it may be mixed. Hongay coal is most suitable for furnaces, household and any purpose, and is used at its best in the various kinds of furnaces fitted with appliances for the production of forced draught.

CLASSIFICATION OF HONGAY COALS

Lump over 50 m/m (over 2")
Small Lump 30 m/m to 50 m/m (1 ¼ to 2")
Nuts : large nuts 15 m/m to 28 m/m (½" to 1")
Nuts : small nuts 10 m/m to 18 m/m (2/5" to 3/4")
(washed) very small nuts (peas) 6 m/m to 12 m/m (¼" to ½")
Ordinary Dust 0 m/m to 30 m/m (under 1")
Fine Dust 0 m/m to 10 m/m (under 2/5")
Run of Mine Mixture of equal quantities of lumps over 30 m/m (1¼") and ordinary dust.

Patent fuel
Naval briquettes, marine briquettes, kitchen briquettes, bituminous eggs n° 1
anthracitous eggs n° 2, kitchen eggs n° 3
consisting of various mixtures of Hongay coal, bituminous coal, and pitch.

Lump and Small Lump

Lump

Average size about 100 m/m (about 4")

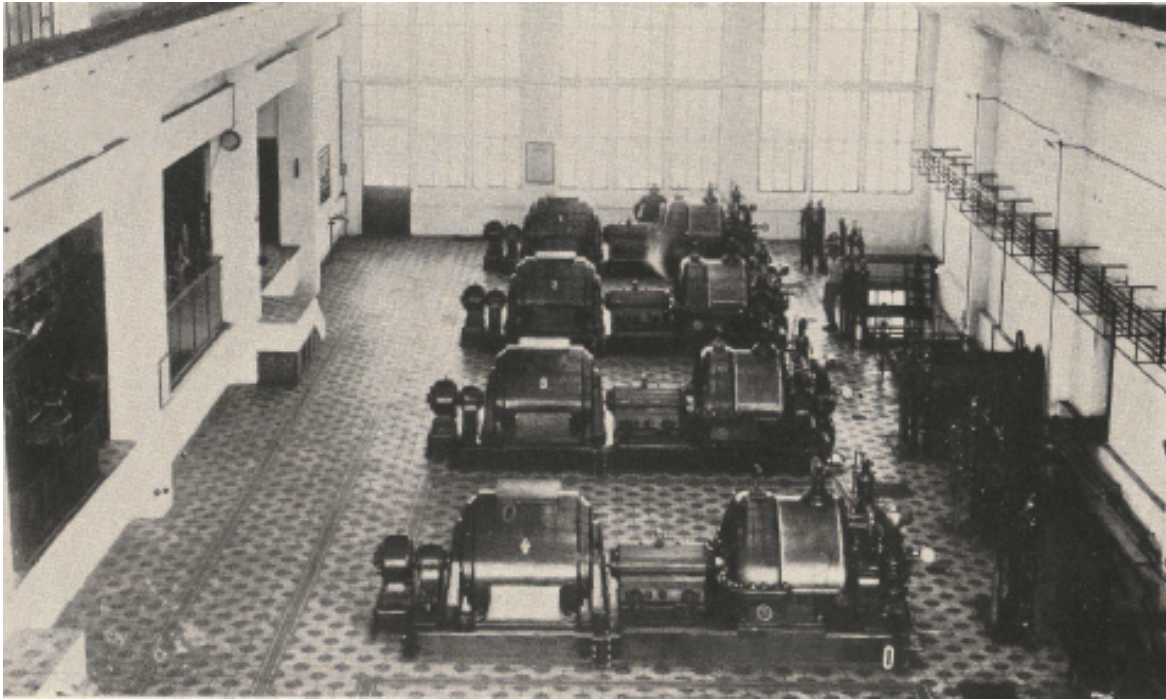
Volatile Matters 6 to 9 %

Ash 3 to 5 %

Fixed Carbon 86 to 91 %

Sulphur 0.4 %

Calorific Power 7700 to 8000 cal. (13850 to 14500 BTU)



Power Station. Interior view

[13] Small Lump

30 to 50 m/m (1¼ to 2")

Volatile Matters 6 to 9 %

Ash 4 to 8 %

Fixed Carbon 83 to 90 %

Sulphur 0.4 %

Calorific Power 7600 to 8000 cal. (13700 to 14500 BTU)

This Coal is specially suitable for domestic heating purposes and for boilers. It is well adapted to the types of boilers with forced draughts, and the merchant service is its principal consumer. It is equally well adapted to boilers with natural draught, but preferably when mixed with bituminous coal. A large part of the output in lump and small lump coal is absorbed by household uses. For this latter purpose, small lump is better as it needs no breaking before use.

NUTS. — All the different kinds of Hongay Nuts are washed, so that they are particularly clean products.

Analysis

Volatile Matters 6 to 9 %

Ash 4 to 7 %

Fixed Carbon 84 to 88 %

Sulphur 0.4 %

Calorific Power 7600 to 8000 cal. (13700 to 14500 BTU)

Their uses are specially adapted to gas producing plants for which all fear of continual stops is then eliminated. The large nuts are used for steamers and the boilers of many factories. They do not require special grates. It is only necessary to create an adequate forced draught which should be stronger of course when small nuts are used.

ORDINARY DUST

Volatile Matters 7 to 10 %
Ash 7 to 10 %
Fixed Carbon 80 to 86 %
Sulphur 0.4 %
Calorific Power 7300 to 7600 cal. (13200 to 13700 BTU)

[Plan de la région charbonnière de Hongay et de ses relations avec Haiphong - voir p. 29]

[15] Hongay Dust is used for very many purposes such as for reducing ores. It is in great demand in cement works, and refineries use it in their ovens. In China, it is used in the manufacture of lime, distillation of native alcohol, and as a kitchen fuel when mixed with clay and made into balls.

FINE DUST. — (0.10 m/m). It has the same composition and properties as Ordinary Dust with a somewhat lower percentage of ash. It is suitable for the same uses.

It is not very much used for boilers, but forms the main fuel of iron works, cement works, sugar refineries, etc.

RUN OF MINE. — [Mixture of Lump and small Lump (50 %) and Ordinary Dust.] The Run of Mine when shipped does not come directly from the Mines ; it is reconstituted after the screening process in which it has been sieved and freed from inert matter.

It is in all respects the best fuel on the market when mixed in the right proportions with bituminous Run of Mine (2/3 Hongay Run of Mine and 1/3 bituminous Run of Mine, for instance). The mixture has a much higher calorific power than bituminous coal. it does not soil the grates and can be used for all boilers with or without fans. Its use is rapidly developing in the merchant service, the principal shipowners of Hongkong and the coastwise traffic use it.

BRIQUETTES. — The Société française des charbonnages du Tonkin produce three qualities of briquettes: the "naval" quality specially used by the Navy, the "Marine" and the "Kitchen" quality.

Naval Briquettes Analysis
Volatile Matters 18 to 19 %
Ash 6 to 7 %
Fixed Carbon 74 to 76 %
Sulphur 0.75 %
Calorific Power 7800 to 8000 cal.(14040 to 14500 BTU)

[17] They produce 8.400 kg to 12 kg of steam in a boiler having an efficiency of 72.67 %.

Marine Briquettes Analysis
Volatile Matters 18 to 19 %
Ash 7.50 to 8.5 %
Fixed Carbon 73 to 75 %
Sulphur -
Calorific Power 7700 to 7800 cal.
(13850 to 14040 BTU)

Hongay briquettes are well known throughout the Far East, they are the main fuel of the principal French shipping Companies of Indo-China, the Railways of Indo-China,

and the French fleet in Far Eastern Waters. They weigh about 6 kg (13 lbs) and are very easy to handle.

KITCHEN BRIQUETTES are very similar to the marine briquettes but have a larger percentage of ash. They have the same uses.

The Hongay Coal Company manufactures also three qualities of egg coal: bituminous eggs (n°1), anthracitous eggs (n°2) and kitchen eggs (n°3).

BITUMINOUS EGGS have the same composition and use as marine briquettes. Compared with the briquettes they have the disadvantage of occupying more room in the bunkers for an equal weight but have the advantage of eliminating loss by breakage when supplied to the furnace and the fire is easier to build on account of the small and uniform size of the eggs.

ANTHRACITOUS EGGS have volatile matters averaging only 14 % ; they burn slowly and without smoke forming thus a perfect fuel for household open grate fires.

KITCHEN EGGS have the same composition as kitchen briquettes ; the form and weight only differ.

Recommendations for the Burning of Hongay Coal

There are two principles to be borne in mind when using Hongay coal in the various fire places.

[18] 1. — The fire must always be kept at a high temperature. With all anthracitous coals, above all those of Hongay, the combustion is not started or maintained by the easily inflammable volatile matters which keep the fire at a suitable temperature. The best results with Hongay coal can only be obtained with furnaces having a very large heating area directly subjected to the radiation of the fire. When the combustion becomes less active, the pressure in the boilers drops, whilst it is exaggerated when one has to open the doors of the furnace to work the fire, this putting the large heating surface in contact with cold air. Every time Hongay coal has not been found satisfactory, it has been due to the fact that combustion has been allowed to dwindle through lack of attention. When there is no forced draught *the thickness of the fire on the grate should remain between 6-in. and 8-in.* The fuel must be uniformly spread ; the fire must be bright, and the flame clear. If the flame is reddish, then there is too much coal and the combustion is too slow. The formation of very shiny patches must be carefully avoided because these are places where the layer of coal is too thin and where exists an easier passage for the draught than in the other parts of the grates. The hollows thus formed in the layer usually soon become replaced by a dark area owing to the cold air which passes through without resistance. This phenomenon is more to be feared with boilers with forced draught than natural draught, and the currents of fresh air may cause contractions of the metal and eventually lead up to the breaking of the boiler tubes.

The gist of the matter is: that whether with natural or forced draught, the fire must be kept at a high temperature and the best way to do this is to have at all times a uniform layer of fuel on the grates.

2. — It has been said that the ash of Hongay coal does not corrode the grate bars or forms scales or clinkers. Therefore, it is unnecessary to poke the fire as is usually done

by drawing the poker underneath the coal and raking the fuel to the sides to scratch the spaces between the bars. It is indeed a very bad practice.

[19] Most coals become slightly softened when they are burning redhot. This gives a certain cohesion to the burning mass when it is poked and sometimes one may stir layers of bituminous coal for a long time without causing any cinders to fall through the bars in any appreciable quantity. Hongay coals, however, do not soften and on being poked they break with the result that a large quantity of half-burnt cinders pass through the bars.

When from appearance of the furnace one guesses that there is a little ash under the burning coal, it is quite enough, *without opening the door of the furnace*, to slip the poker under the grate, with its point turned upwards, and to lightly shake the bottom of the burning layer.

Conclusions

1. — The door of the furnace should be opened as seldom as possible.
2. — The layer of burning coal must be kept even and not more than six to eight inches thick.
3. — Once the fire has been well supplied with fuel, the burning part should be touched as seldom as possible.

These are essential conditions for the best utilization of Hongay coal which will then burn in any fire-place with a large grate area to the complete satisfaction of the consumers.

PRODUCTION

Production of Hongay Mines

1900	194,441
1916	575,600
1921	720,000
1922	760,000
1926	855,000
1927	1,030,000
1928	1,450,000

Distribution of Sales of Hongay Mines

	1925	1926	1927	1928
French Indo-China	291	307	296	288
Bunkers	33	62	68,5	70
Exports	373	530	687	789

[20]

Exports of Hongay Mines

	1925	1926	1927	1928
China, Central	53	107,5	133	197
China, South	34	55	77	98,5
Japan	182	236	334	365
Others	5	6,5	4,5	8
	<u>373</u>	<u>530,5</u>	<u>687</u>	<u>789</u>

Since 1929, shipments have been made to North America (Vancouver, Seattle, Montreal) and to France (35,000 T. in 1932) ; the well-known firm of Worms and Co. has been appointed as representative in France of the Hongay Mines, whose coal easily competes with the best class of Welsh anthracites.

The quality of Hongay coal is one of the best in the world amongst coal of its class. It is certainly the best of its kind in the Far East.

A certain number of years have been taken for preparing the equipment of the mines, and the production has been kept low. The last development of the production shows that these collieries have now resolutely started a considerable expansion, which will soon rank them amongst the biggest mines of the Far East.