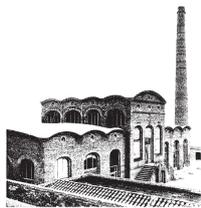


# CERCS MINING

TEACHING HANDBOOKS No. 11

MUSEUM OF SCIENCE  
AND TECHNOLOGY OF CATALONIA  
(MNACTEC)

MUSEU DE LES MINES DE CERCS



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Page 4-5

## THE COAL AND ITS EXPLOITATION IN BERGUEDÀ

### THE COAL

The coal is an organic mineral that is made of variable quantities of carbonate, oxygen, hydrogen and nitrogen, and of impurities, formed by the accumulation and transformation of vegetable remains in an advantageous atmosphere. The coal deposits began to appear 250 years ago as a consequence of the geologic cataclysms that provoked the basement of big forests under stones and a mass of sand. The pressure that the forests suffered through millions of years, explains the transformation of the wood into the current mineral. The coal process, known with the name carbonise could be more or less intense giving rise to the different kinds of coal:

*Peat:* is a wet spongy substance, of a little calorific content, in the transformation of the coal it is considered in the first step. It is used at homes heating, due to its little calorific content.

*Lignite:* it is a variety of peat with less water, that points to the transition to the real stone coal. It has between 2000 and 5000 calories/gram which made it useful for industrial uses. It is found in Alt Berguedà region.

*Bituminous coal:* with a little of peat but with much carbonate and less oxygen, it has between 6500 and 7000 calories/gram.

*Anthracite:* is the purest one with the highest calorific power. It has 7500 and 7600 calories/gram.

### THE COAL FIELD IN L'ALT BERGUEDÀ

With an extension near 40 Km<sup>2</sup> stretching in the south slope in the Pre-Pyrenees. The lignite layers were formed 65 millions years ago, in the middle of the secondary and tertiary ages, over superior Cretaceous stratum and they are inserted between marl and limestone. Although, since at the end of the XVIIIth. century the coal of Alt Berguedà was tried to use for iron, glass and copper forges, it was not until 1851 the first miners societies were built with the aim to assign the lignite to some industrial uses, without much success. The definite exploitation was since 1895 thanks to the railway construction and in a constant modernisation process which we analyse from five stages.

To exploit the coal deposits, the miner industries and the privates have to apply to the administration the miner concession, it means, the exploitation power of the coal, that it always needs a previous geologic and topographic study and the analysis of the coal quality that determines the different test drilling. Afterward it is determined which kind of exploitation is the most suitable:

### Open cast mine

It consists of opening a quarry to

eliminate the recovering and leave the coal uncovered. In Berguedà region the open casts were exploited in 1978-1985.

### Inner Mining

Underground, on the basis of galleries or shafts. The features of the Berguedà basin, narrow coal layers slightly inclined and separate from great layers of different materials. The most generalised system of exploitation was the galleries. Although in the area of Saldes, where the layers are very inclined, the exploitation has always been done through shafts.

The mines exploited by "Carbones de Berga S.A." with the system of galleries, has been characterised by a notable and progressive system of technical work which through time can synthesise in five big stages.

Berguedana basin  
Saldes-Vallcebre-Fígols (partial exploited by the company "Carbones Pedraforca, SA." La Nou-Malanyeu-Catllaràs (now it is not operating). Peguera-Cercs (now it is not operating)

Catalan coal fields  
Catalonia is a country with lack of coal. However, from the XIXth century the deposits of lignite, bituminous coal and anthracite have been mined to the utmost.

Page 6-7

## THE MINING COLONY OF SANT CORNELI: A CENTRE OF INTERPRETATION

The mining colony of Sant Corneli, located in Cercs (Berguedà) was founded at the end of the XIXth century in order to accommodate the people who worked in the coal mines, following the industrial colony models that years ago had already been established in Catalonia especially in the Llobregat foothold in Berguedà. The colony, like Sant Josep and Consolació, were the most important mining centres in Catalonia, and the most extensive mines exploitation centres, situated in Cercs, Fígols and Vallcebre. These mines were exploited by "Carbones de Berga S.A." founded in 1911, they have worked until 1991. Nowadays, within a building, which first was a convent and then "Home of the miner" and inner of the 500 metres of St. Romà gallery, solely devoted to explain the history and the technological evolution of the coal mining in Berguedà, intends to become a centre of interpretation of 150 years of life evolving around coal. The museum, local board formed by of the council of the town of Cercs, the mining companies Carbones de Berga SA. and Carbones Pedraforca SA., and the National Museum of Science and Technology of Catalonia.

From Sant Corneli to the Llobregat. In 1974, the company Carbones de Berga S.A., got its major growth. More than the miner colonies there was a wide zone of services too (mechanise, workshop plumber's, storage's, a

company dispensary, co-operative store, coal washhouse, offices, etc.) situated in "La Consolació" near Olano's family old residence. Beside the miner equipment there was the cement factory, the building of the old heat-electric station and the new heat-electric station of Cercs. The train arrival at the foothold of the mine in 1904 supposed the only way of communication and transport up to Berga. "Figols The Mines" station turn "La Consolació" colony into a neuralgic centre of exploitation and all the external and internal network of transport, the company built until 1960 this network of transport (railway, inclined plane, cable-railways, and funicular) having as an objective to connect the different exploitation levels to the railway station. In 1955 a road was built which from C-1411 goes to Sant Corneli and Figols.

1. Sant Corneli colony (Cercs Mining Museum).
2. Sant Josep colony.
3. La Consolació colony.
4. Sant Romà mine.
5. Esteve mine.
6. Sant Josep mine.
7. Wood square.
8. Police station.
9. Figols count castle.
10. Train station Figols Les Mines.
11. La Consolació shrine.
12. Scrubber (1931).
13. Old heat-electric station (1929).
14. Cercs new heat-electric station (1972).
15. Cement factory of Figols.

#### Page 8-9

### A MAZE OF GALLERIES THROUGH TIME

#### THE FIRST MINES FROM 1851 TO 1895

In the first mines the most superficial deposits were exploited in order to get a direct access to the coal seams opening the galleries which followed the direction and inclination of the layers and hardly had more than 500 metres long. The pickers pulled out the coal by hand with the only help of a pick and they loaded it into bags to the wagons, which were dragged first by men and then by mules. Out of the mine, women, children and elderly people classified manually the coal. It consisted of separating the coal from the rest of the sterile materials and classified the pieces of coal according to their size.

The conditions of work were extremely hard: long working days, low wages and over all, the dangerous work into the mine, with badly ventilation, dust, dampness and where there often were explosions and landslides. Since 1851 one of the big problem of the small miner companies was the way how they make the coal arrive to the consumer centres, as the train did not reach in Alt Berguedà until 1904. Since then, the coal was delivered through a railway with animal traction and with carts that is why only the river factories and in Berguedà colonies got it. A very little market which only used coal when the free hydraulic power the Llobregat provided, lacked.

In The Sant Josep mine The miners went into the mine at 6 in the morning and got out at 6 in the evening;

in the mine they ate, rested and worked with the only light of an oil lamp, known as the popular name "llum de gall" which started to be made in the French miner zone of Saint Etienne in 1830 and soon, was used in all European mines.

"Mina de 1851 a 1895": (The mine from 1851 to 1895). "Betes de carbó ": (The coal seams). "Llum d'oli ": (Oil lamp). "Estèril ": (Sterile). "Xemeneia": (Chimney). "Bocamina": (Mine entrance).

Sant Esteve mine  
Sant Esteve mine, situated at 861 metres high, documented since 1894; in 1914 it had two galleries of 1599 and 1555 metres long and despite it had electric wiring, the miners still used oil lamps.

#### Page 10-11

#### THE PERIODE 1895-1930

In 1893, José Enrique de Olano i Loizaga bought most of the mines in the area in Cercs, Figols and La Nou and he started a new process of modernisation of the exploitations. At the same time the construction of the miner colonies of Sant Corneli, Sant Josep and La Consolació and the railway at the foothold of the mine were boosted. The investments needed in order to make the coal yielded advised Olano to create in 1911 a limited company "Carbones de Berga SA." this new company turned into the most important one in the miner sector in Catalonia.

Although the coal work went on manually, important advances were introduced: the oil lamp was replaced by carbide lamp and the transport system took a great advance. Thanks to the use of the animal traction railway which carry the coal out of the mine, once the coal was out and through a great network of inclined planes and cable-railways the coal went to the scrubber where through mechanical systems, cleaned it and classified it according to their size and the demands of the market, in four categories: "porgat", "galeta", "grana" and "menuts".

During this period of time, the Berguedà lignite was used by the textile industries, the railway engines and in the cement factories and pottery kilns, it was also used to make the gas which light streets and buildings in many Catalan cities and for domestic consumption (heating, stoves, heaters).

José Enrique de Olano y Loizaga (Liverpool, 1847 – Barcelona, 1934) Mining engineer and member of a Basque family who took part in important enterprises (naval, mining, metallurgy's, textile) attained to totally modernise the mining in the region. In 1900 his enterprise became tenth in importance throughout the Spanish state sector. In 1908 the king Alfonso XIII visited the mines and the king granted J.E. de Olano the title of count of Figols.

Central of "Collet"  
In 1906 started the construction of the hydroelectric power station of Collet, situated in the Llobregat river. In 1912 it worked with a Francis turbine of 680 CV.

and an alternating current generator of 600 KW. made by the enterprise of Barcelona "La Industria Eléctrica". From the hydroelectric power station of Collet, the electricity was distributed to the mines throughout a three-phase line of 5000 V, that at the foothold of the mine, was converted into direct current of 300 V.

Exploitation front from 1895 to 1930. "Empastador": (Sizer). "Barrinador i falla": (Driller and fault). "Galeria": (Gallery). "Llum de carbur": (Carbide lamp). "Canal oscil-lant": (Fluctuation channel). "Front d'arrencada": (Outburst front). "Galeria de direcció": (Direction gallery).

Poor gas  
When the hydroelectric power was insufficient, the coal gas station started to work, built in 1905 also supplied electricity in order to make fans work, which introduced fresh air into the mine and to the inclined planes and to the cable railways.

#### Page 12-13

#### THE TECHNICAL ADVANCES FROM 1930 TO 1965: THE COMPRESSED AIR REVOLUTION

At the same time the mine electrification was generalised (ventilation, transport and scrubber) the direction galleries were made safer and wider using cement and stone. The Consolació mine, became the mining centre. There, dwellings and services as the main auxiliary fittings of the mine were built: the scrubbers, plumber's, carpentry, the company warehouse and all the outside transport network, by means of cable-railways and inclined planes, took the coal from all the mines to the scrubber and to the train station.

In fact, the most spectacular advances were at the outburst and progress front where the worker hammers and compressed drills became widely known. The fronts went beyond 50 to 250 metres propped up by metallic structures, called friction piles. The large quantity of coal forced them to rise the wagons capacity went beyond 1750 litres and electric and diesel engines bought in Germany, Great Britain and Asturias were introduced.

Most of the coal in the region was destined to the thermal power station for the traditional domestic consumption (cookers and heaters) and to supply the engines of the cement factories and for the new companies destined to the potash mining of Bages (Cardona, Súria, Balsareny and Sallent).

Old thermal power station in Cercs  
The coal increment production made possible in 1929 the construction of the first thermal power station of Cercs which consumed most part of the coal in the region and had 14 MW. of power. The building was an initiative of the most important electric companies of Catalonia, "Riegos y Fuerzas del Ebro", "Energía Eléctrica de Cataluña" and "Compañía Barcelonesa de Electricidad".  
Exploitation front from 1930 to 1965  
"Martell d'aire comprimit": (Compressed

drill). "Front d'arrencada i d'avenç": (Outburst and progress front). "Piles de fricció": (Friction piles). "Gàbies de fusta": (Wooden cages). "Vagonetes de 1750 litres": (Wagons of 1750 lts.). "Locomotora dièsel": (Diesel engine). Scrubber

The construction of the thermal power station obliged "Carbones de Berga S.A." to modernise the scrubber inaugurated in 1931, situated at the foothold of the train station of Figols-The Mines.

#### Page 14-15

#### THE MECHANISATION FROM 1965 TO 1976

In 1963 the mechanic outburst system started being introduced by using brushing machines operated by compressed air engines parallel displaced through 250 metres of outburst front pulling the coal and the materials from middle layers off; meanwhile a conveyor belt capable of carrying 50 tones of weight, carried all the materials directly to the gallery. The outburst front and the galleries were lit with lamps of 60 W placed every 6 metres. The miners, well equipped (mining suit, gumboots and helmets) wore electric light fixes at the top of the helmet.

The introduction of these modern outburst machines obliged to replace the old fortification systems by new modern ones; into the galleries the metallic fortifications became widespread and in the outburst the pneumatics piles were introduced which moved forward at the same time of the front, and wooden cages as the sterile material now went together with the coal out of the mine.

The mechanisation of the exploitation front notably affected the workers, who had to adapt to the new machinery and the new work system: the two shifts of work were expanded to a night shift, who was in charge of machinery repairing and maintenance, at the same time the conditions of work and safety improved. The need to make the exploitation profitable, in a period of time that the coal was already beginning to suffer from the oil competition and from other energies (gas and nuclear), made in 1963 the inauguration of the cement factory. In 1968 the new thermal station started to be built. Through this process, the electric company FECSA became in 1969 the main shareholder of "Carbones de Berga S.A."

Coal destination of the company "Carbones de Berga S.A." in 1965  
Thermal power station; 37,5 %. Textile industry: 17,5 %. Domestic uses: 12 %. Cement industry: 10%. Glass and ceramic industry: 9 %. Potash: 5 %. Paper industry: 4,6 %. Chemical industry: 3,7 %.

The mechanisation from 1965 to 1976  
"Raspall": (Brush). "Piles pneumàtiques autoavançables": (Self-balanced pneumatic piles). "Fortificació metàl·lica de secció semicircular": (Metallic semicircle section fortification).

#### Rescue teams (1943)

Despite technical advances and safety controls, the mine work was hard and dangerous, in berguedan mines there is firedamp which causes big explosions. The berguedana mining history is full of dramatic events, the most important ones were in 1943 in the mine "Clara" of l'Aspà (Saldes) with 36 dead people, and in the Consolació mine (Cercs) in 1975 with 32 casualties. The cause of this was always the same, a firedamp explosion.

Cements factory of Figols, S.A.  
In 1961, the company "Carbones de Berga, S.A." and the group March built, at the mine foothold, the factory "Cementos de Figols, S.A." which using the sterile stone of the mine and the gases that leaked out from the furnaces of the thermal power station made, between 1962 and 1986, 120.000 annual tones of cement.

#### Page 16-17

#### THE DEFINITE MECHANISATION SINCE 1976 AND THE CRISIS

The last great effort to mechanise and modernise the mine with the objective to make competitive the coal price, started in 1976 introducing the outburst fortification fronts known as of shield, widespread in the mines of Germany, meanwhile old diesel engines and the wagons which carried the coal outside the mine were definitely replaced by the conveyor belts. The open cast mine exploitations were also started in order to access to the superficial layers.

Nevertheless, the coal crisis in the Berguedà was more than announced although the new thermal power station consumed all the coal of the Berguedà basin. In 1975 the first important water fluents were found and had to be taken out through mechanic systems of pumping; the flooding in 1982 flooded most of the 40 Km of galleries, specially the ones below the Llobregat river level; from then on the miners had to share their usual work with the pumping. The combustible (petrol, gas) competition and the increasing use of hydraulic and nuclear energy, added to the exhaustion of the richest layers, the long distance until the front (as far as two hours) and the strong competition of the third countries accelerated the crisis. On the 31st. December 1991 the company Carbones de Berga, S.A. closed down and the period of the most important coal industry in Catalonia ended.

The definite mechanisation since 1976  
"Fortificacions d'escut autoavançables": (Self-balanced shield fortifications). "Cintes transportadores blindades": (Reinforced conveyor belt). "Direcció a la galeria central fins a la bocamina": (Direction to the central gallery until the entrance). "Més de 5000 m": (More than 5000 m.)

New thermal power station of Cercs.  
Built in 1972, above the cement factory of Figols and near the Consolació mine, the new thermal power station used up the whole coal from Berguedà, it also burns lignite from other origins (Terol and Mequinsena) and imported soft coal

(Polonia and South Africa). From the station, the energy is distributed into four lines to Llavorsí, Sant Celoni, Berga, Vic, Alp and Ribes de Freser.

Characteristics of the new thermal power station of Cercs  
Coal origin: Berguedà and others. Coal supplies: about 10.000 tones. Water consumption: 500 m<sup>3</sup>/hour which the third part is recovered. Coal consumption: 2.500 tones/day. Ash: 1.200 tones/day. Chimney height: 120 m. Refrigeration tower height: 103 m. Maximum production: 160.000 KW/hour. Power: 160 MW. Diesel boiler: 520 t/h. Siemens turbine: 64 Kg/m<sup>2</sup>. 500C. Siemens current generator: 10,9 KW nom.

#### Page 18-19

#### MINER COLONIES

#### THE CONSTRUCTION OF THE COLONIES

The isolation of the mine from any near population centres, the lack of communications and the need to have a steady labour, drove J.E. de Olano to build dwellings and basic services for the miners. The businessman did not hesitate to put into practise in his mine the already developed model used in the textile colonies, in Berguedà and in other places of Catalonia since 1858. Giving to the miners and their families dwellings and the most essential services (baker's, canteen, church and school) achieving to end with the lack of work typical in that rural zones and from the mountains where the miners, like in other miner zones in Spain, were also farmers, and shepherds.

The starting point was Sant Corneli, at an altitude of 960 m. where there were the first galleries and some buildings: a small Romanic church devoted to Sant Corneli, a flour mill some miners dwellings and a canteen (greengrocer's, daily products and wine), a small group of dwellings at the "Serrat dels Bous", today called "Els Tilos". From this first population centre, Olano started to project with the help of his engineer, the Asturian Suárez del Villar, the colony of Sant Corneli. Between 1901 and 1904 his private residence was also built, far from the mining colony, but at mines base, near the train station "Figols-Les Mines" and at the baroque sanctuary of the Consolació. The building, a medieval castle, has been one of the most emblematic buildings of the mine.

In 1918 and 1920 the services buildings were inaugurated: the company store, the offices, the theatre -then the cinema-, the school and the nun residence, today museum central office. This building, which accommodated the school rooms, the dining rooms and the nuns residence, was converted in 1931 into the "Mining House" assigned to services and leisure (café, library, school, home manager, cinema, barber's and gaming room and conference hall).

At the same time Sant Corneli was being built, Olano planned two more colonies construction: Sant Josep and La Consolació. Sant Josep is near the mine entrance with the same name at an altitude of 700 m, in 1908 it was inaugurated. La Consolació, near the station, got the supplies next to Ca l'Estanís where the shop, the baker's and the canteen were. Some dwellings were also built for the colliers, a company store, the dispensary and the most important area of the mine, becoming, since 1924 the centre of exploitation.

Miner colony in 1950

SANT CORNELI

1. Sant Corneli church.
2. Public utility-room.
3. Vice-chancellor's office.
4. Baker's.
5. Cinema-theatre.
6. Company store and shops.
7. Miner house.
8. Community clinic.
9. Sant Romà square.
10. Sant Romà mine.
11. Scales.
12. Market garden.

#### Page 20-21

#### LIFE IN THE COLONY

Life in mining towns was hard, due to their isolation and to the fact that all their inhabitants depended on the mine and the miner company. Until the civil war, despite the isolation, the colonies strongly live the political and social demands: the constant confrontation with the company, the fight for working and social demands, the anticlericalism, the power of CNT-FAI labour union cannot be sorted out from its history.

Since 1939, the situation changed notably, the political and ideological repression was applied severely, and the paternalism implicit in the system of industrial colonies reached its highest points. The religion calendar ruled over the feast time and Santa Bàrbara, the miner's patron saint is kept as the main feast with the major feast in September. Sant Corneli parish organised many acts and the "miner house" the cultural centre of the colony took care of the rest. In this centre where the school was, and also the bar, a cinema-club was run and a library and gaming room (table-tennis, table-football, snooker table, etc.) were organised.

During the immediate years to the civil war, when unmarried miners coming from the minefields from throughout Spain arrived in the Berguedà seeking for work in the mines, many dwellings consisting of kitchen -dining-room, lavatory and two or three bedrooms were filled with subtenants. They worked at night shifts so that when they came out from the mine they could sleep in the bedroom belonging to the members of the family who lodged and fed them exchanging for money and left the room empty. These were years of poverty and difficulties, from miserable salaries and absolutely starving and feeling scared. The cinema in the colony and football were the principal hobbies for people during the fifties and sixties, when in Sant Corneli there were up to 3.500 people living.

The washing place of the colony Near the church, were women and children met during the summer and winter and all the year on, they washed the miners clothes.

Miners coming out of the mine after their closing in 1977

The miners demands of "Carbones de Berga S.A.", accomplished the solidarity and the support of the whole region, the labour union, and from the political parties.

#### THE TIME OF THE DISTURBANCES

The colony was a lively village, that was pulsating at the sound of the feast of Santa Bàrbara, the miner's patron saint, when the mourning filled the hearts during the tragic accidents, and when the time of the disturbances and the work claims arrived. With these hard work conditions is natural to imagine that the coal field like all the rest in the state, made, through its history, important episodes of work and social claims. The most remarkable which have marked the history of the regional mining claims, it is worth to emphasise two: the Alt Llobregat disturbances and the 1977 strike.

#### The Alt Llobregat disturbances in 1932

Since the beginning of the XXth. century the municipal population growth in Cercs had been spectacular: In 1900 there were 532 inhabitants in 1920 there were 1.445 and in 1930 there were 1701; this growth was concentrate over all, in the mining colonies. The miners work conditions were qualified by the media as the hardest in Catalonia, it is logical to understand, the miners were hopeful of the new Republic govern. Having legalised the labour union, the CNT-FAI became into the major trade union (1.451 members) to the coal field, with the rest of the shops stewards in Berguedà and Bages, were 23.186 members and an own weekly magazine "El Trabajo", which spread the orders of the liberal communism. The trigger for the miners disturbances of Alt Berguedà was the confrontation between the labour union CNT-FAI and the owner, of the textile colony Carme (the colony was the property of the miner company where the wives miners work) which did not respect the agreement signed in the trade agreement of this sector.

The strike in the textile factory spread to the mine and it was used to claim better work conditions and also better salaries. On the 26th January 1932, as a drop of oil, the miners of the potash in Sallent, Súria, Cardona and most of the textile workers in the Llobregat field joined it, but specially the miner colony of Sant Corneli. The reply of the Republic govern did not wait: the army and the civil guard appeared at the disturbance centre and without any resistance disarmed and controlled the strikers. Among 140 arrested (41 were from Cercs and Fígols) 188 were taken to Guinea. The stir the disturbance had in Catalonia and in Spain was very important the press made an accurate coverage and

the photos taken by the reporters enlightened very well the arrival of the civil guards in Sant Corneli and the transfer of the arrested ones.

#### The strike in 1977

In 1977 the company "Carbones de Berga, S.A." agreed a reduction in its staff which affected to 429 workers from a total of 1.400. On the 7th December 1977, 225 miners closed themselves up into Sant Josep mine, the Consolació and El Collet and the committee accomplished the miners started a strike. Under the slogan "closed mine, finished region", the region solidarity lived the closure and they achieved to retire the crisis dossier and open the negotiations. It was the last and the most important strike in Berguedà coal field.

#### Page 22-23

#### VOCABULARY

Propping-up: Maintenance of the mine roof formed by supports, picks, timbers, girders and helped by walls of sterile materials of bricks, concrete and also by metallic arches made to measure.

Explosives expert: Miner responsible for preparing the gunpowder or dynamite charge and blasting them. Framework: Metallic bars destined to held on the mine roof.

Mine entrance: Overture used to go into from the outside to the main gallery of the mine.

Oscillating channel: The coal transport system from starting mechanism front to the gallery, activated by an alternative movement, given by an electric engine, moves the mineral helped by a pendent.

Timber: Miner responsible of the construction and the maintenance of a gallery fortification.

Sterile: Are the materials which go with the coal layers which needed to be separated. They are used as a piece of rubble in order to fill again the mining cavities or they go as a dumping site.

Exploitation: Activities applied to the mining company operation and specifically it is known as a mineral coal outburst.

Faculty: Officer below mining engineer, responsible of exploitation techniques.

Underpinning cage: Pieces of wood superimposed with a square shape which are used to hold the roof that is already exploded.

Principal gallery: It is the one which connected with the exterior and where the miners come into and go out, where the mineral is transported and where all the secondary galleries of exploitation come together.

Firedamp: Gas mixture produced in many coal mines and with air contact made an explosive of high power.

Firedamp detector: It was able to detect the degree of firedamp into the

mine in order to avoid any explosions.

**Safety lamp:** Flashlight-producing light from a flame which is covered with a wire netting cylinder that prevents the firedamp explosion.

**Carbide lamp:** Light producing a bright flame in order to burn the gas produced by the carbide and during the XIXth. century until 1959 it was used to light galleries.

**Helmet light:** Fix-light at the front part of the helmet and got supplies by an electric battery, held at the miner's belt.

**Pneumatic drill:** It is used to make holes and to pull out the material and it gets its supplies from a compressed air compressor.

**Support:** Metallic or wooden piece used to hold the mine roof.

**Pickaxe:** Tool similar to a pick, sharp-pointed, used to excavate hard and dry material.

**Square:** Named to the wooden structures with square or rectangular shape and the metallic ones with arch shaped, used to hold the galleries roof.

**Scrubber:** Place where the coal that came out from the mine is separated from the clay dust or from any other material through different waterline systems, to filter (through a sieve) or dragging the solid particles by a fluid, etc.

**Silicosis:** Pulmonary illness caused by silica dust inhalation very common in the miners.

**Dump tip:** Place used to dump the sterile materials of the mine turned down during the mineral treatment.

**Truck:** Wagon used for the wood transport into the mine.

**Wagon:** Vehicle of different size, brought into the open and with a big capacity, that goes by railway.

**Little truck:** Little wagon brought into the open and dumper used for the mineral transport.

## ACTIVITIES

Prepare an outline, summarising the uses and applications of the coal starting from the information the exercise book gives you and with the visit of the museum. The coal mining and the coal consumption have negative consequences by the environment. Which are they and why?

The coal (anthracite, soft coal and lignite) it is not the only energetic mineral: nowadays the petrol, the natural gas and uranium are very important despite Spain lacked of them. Revising the energetic applications of the coal, explain which applications have the other power supplies already said.

The electricity is a secondary power supply that needs a primary power (hydraulic, thermal and nuclear) to produce. Do a flow chart or conceptual map in order to relate these concepts: PRIMARY POWER SUPPLY, COAL, WATER, WIND, NUCLEAR POWER, ELECTRICITY, NUCLEAR POWER STATION, NUCLEAR REACTOR, TURBINE, HYDROELECTRIC POWER STATION, THERMAL POWER STATION,

SECONDARY POWER SUPPLY, PETROL, GAS, URANIUM, ALTERNATING-CURRENT GENERATOR, TRANSFORMATION, POWER SUPPLY, CONSUMPTION.

The pad offers you maps, drawings and photographs of the miner colony and its spaces when it was fully inhabited and depending on the company Carbones de Berga S.A. Today this has changed although most of the buildings are kept; which made reference to the services has nearly disappeared. When did Sant Corneli stop being a miner village? Why? Which social and economics consequences has had?

From the information which is offered to you by the permanent exposition devoted to the life in the mine, choose a theme (the dispensary, the school, women work, the time of the disturbances, the company, the world of work, the flat) that you are most interested in and make an information summarise.

As a synthesis activity we propose you an exercise, try to interpret the experience of other person, since we are all capable of feeling and understanding, although many years have passed, the problems and their experiences. Imagine you are a boy or a girl of 14 who lived in Sant Corneli in 1932. With this unique reference you will have to invent some basic facts: name and surname, profession, characteristics and origin of your family, economic situation, attitude in front of the concrete historic situation of Alt Llobregat disturbances in 1932, etc.

Since this year, you have to rebuilt your life in the colony in 1998, at the age of 80 you tell your life to a group of boys and girls who are visiting the Cercs mining museum.

We suggest you dates and facts, surely they should have been very important: Alt Llobregat disturbances in January 1932. The civil war (1936-39). The Franco period (1940-1975). 1965: Mechanisation of the mine. 1954-57: Construction of the road to Sant Corneli. 1972: Inauguration of the new thermal power station of Cercs. The strike in 1977 in the coal field. December 1991; the closure of the mine.

Which are the reasons that drive J.E. de Olano to build Sant Corneli miner colony, Sant Josep and La Consolació? Do you know any other industrial colonies in Catalonia? Where are they settled down any why? Do they look like miner colonies? In what aspects ?

Make a graphic with the information of the production of the company of J.E. de Olano from the end of the XIXth century to 1917. After doing this you are able to answer these questions: Which are the causes of the increase of the production? What relation is there between the increase of the production and the conflicts of the first world war? You will find information in this pad at the same time you revise the characteristics of the technical evolution of the two first phases and

establishing the suitable relation with the use for this production, Evolution of the coal production since 1895-1917: Year. Metric tones. 1895-12.930. 1899-19.418. 1903-36.376. 1905-63.411. 1912-100.000. 1917-120.000.

Make a bar chart with the information of the miner population evolution in the region of Berguedà (1940-1994). Connect this bar chart with the technical evolution of regional miner since 1930 to nowadays, you must not forget the technical advances and the problems made by the coal crisis. Year. Number of workers. 1940-1.600. 1945-4.458. 1955-3.200. 1960-3.000. 1965-2.800. 1970-2.023. 1975-1.583. 1980-1.200. 1985-878. 1990-316. 1991-166. 1994-150.

## Page 24

Mines of Catllaràs

The mountain coal mines of Catllaràs (La Pobla de Lillet) started being exploited at the end of XIXth century, but from 1901 the exploitation was in charge of the company Asland with the aim to obtain coal, in order to operate the furnaces of the cement factory of Clot del Moro.