The European Lignite Industry: II[1]

THE FACTS OF THE SITUATION (*cont.*)

Hours of Work

The question of hours of work is the most important of all, because it is to hours that the proposed system of regulations must apply. We shall examine in turn: (*a*) the nature and character of the regulations; (*b*) the limitation of hours of work, and, for underground workers, the method of calculating the length of the shift; (*c*) breaks; and (*d*) overtime.

Nature and Character of the Regulations.

In the countries covered by the present report, except Hungary and the Netherlands, hours of work in lignite mines are regulated by law. In Austria[2], France[3], Greece[4], and Spain[5] the regulation of hours of work in mines is the subject of special legislation; in Czechoslovakia[6], Germany[7], Italy[8], Poland[9], and Yugoslavia[10] it is contained in the general legislation on hours of work. The latter class of legislation contains special provisions for mines, dealing in particular with the method of calculating the length of the working day. In Hungary rules for hours of work have to be inserted in the works regulations that every occupier is required, under section 200 of the Mines Act of 1854,

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[1] For the first part of this report, cf. *International Labour Review*, Vol. XXI, No. 6, Dec. 1930, pp. 752-772.

[2] Act of 28 July 1919 (Mining Act).

[3] Act of 24 June 1919—Labour Code, Book II, Title I, Chapter II, Part II.

[4] Decree of 4 December 1925.

[5] The provisions applicable to mines are found in: (1) the Act of 27 December 1910 fixing the maximum working day in mines; (2) the regulations for the administration of the Act of 27 December 1910 fixing the maximum working day in mines, approved by Royal Decree of 29 February 1912; (3) the Royal Order of 28 September 1927 relating to hours of work in coal mines.

[6] Act of 19 December 1918 on the eight-hour day.

[7] Orders of 21 December 1923 and 14 April 1927 on hours of work.

[8] Royal Legislative Decree No. 692 of 15 March 1923 on the limitation of hours of work of wage-earning and salaried employees in industrial and commercial undertakings of every kind.

[9] Act of 18 December 1919 on hours of work in industry and commerce.

[10] Act of 28 February 1922 on the protection of workers.

to draw up and have approved by the Mining Administration. In the Netherlands the provisions of the Royal Decree of 22 September 1906 relating to hours of work in mines for adult workers apply only to workers employed underground and to surface workers in charge of winding machinery or shaft signals ; other adult workers employed at the surface and the whole staff of surface mines are thus excluded from the scope of the statutory regulations.

Collective agreements regulating hours of work are in operation in Czechoslovakia, Germany, Italy, Poland, and Yugoslavia. Generally speaking, these agreements are concluded for a single coalfield or a single mine. In Czechoslovakia there are two collective agreements, one for northern Bohemia and the other for the Falknov field. In Germany the collective agreement of 29 September 1928 applying to the mines of the central German lignite field is supplemented by an agreement on additional work concluded on the same date ; in the Rhineland the collective agreement of 30 April 1929, which embodies the terms of the arbitration award of 26 September 1927, is accompanied by works regulations framed in conformity with the agreement of 23 December 1920. In Yugoslavia collective agreements are in force in all the State mines but in only a few of the private mines. All these collective agreements keep within the general framework of the legislation on hours of work ; some merely reproduce the statutory provisions or refer to them. In addition, some of them deal in detail with special questions such as overtime, Saturday work, work on Sundays and public holidays, breaks, hours of work at unhealthy workplaces, etc.

In the countries mentioned above the statutory regulations make no distinction between lignite mines and hard-coal mines. There are, however, separate collective agreements for lignite mines and hard-coal mines in Czechoslovakia, Germany, Poland and Yugoslavia. The provisions on hours of work in the two kinds of agreement do not however differ materially, except in Czechoslovakia and Germany. In Germany the difference is chiefly in respect of breaks : in lignite mines breaks are not included in hours of work, and the working of the mine is stopped at rest times ; in hard-coal mines breaks are included in hours of work, but the working of the mine is never completely stopped. The shift is therefore longer in lignite mines than in hard-coal mines. In Czechoslovakia the difference is in respect

of Saturday work. In hard-coal mines the duration of work on Saturday is the same as on other days, namely, 8 hours, 2 of which, however, are considered as overtime for underground workers, and remunerated by a special allowance. In the lignite fields of northern Bohemia and Falknov, only 6 hours' work is done on Saturday. In the other fields some only of the undertakings have a 6-hour working day on Saturday.

In the countries with both underground and open workings, in particular Austria, Czechoslovakia, Germany, and Yugoslavia, the same legislation and the same collective agreements apply to both kinds of mine. In general the regulations differ only with regard to the method of calculating the length of the shift, which requires special provisions for underground workings. Further, in central Germany the hours of work vary in certain cases according to the nature of the mine, and even where the hours of work are the same the length of the shift is different owing to the fact that the breaks which are included in it are longer in open workings than in underground workings.

In most of the countries the regulations on hours of work apply to all lignite workers. This is definitely so in Austria, Czechoslovakia, France, Germany, Poland, and Yugoslavia.

Limitation of Hours of Work.

In open workings the legislation prescribes a working day of eight hours in Austria, Czechoslovakia, Germany, and Yugoslavia. The same hours are prescribed in the collective agreements in Austria, Czechoslovakia, and Yugoslavia. In Germany the collective agreement and the agreement on additional work in force in central Germany fix hours of work at the higher figure of 8½ in undertakings where work is not continuous and 9 hours in undertakings where it is, in particular in factories, boiler-houses, tar distilleries, chemical works and ancillary establishments, and power houses ; the collective agreement regulations in force in the Rhineland fix the working day at 8½ hours. In the Netherlands the working day is 10 hours. The working week is fixed by law at 48 hours in Czechoslovakia and Yugoslavia. In most of the Czechoslovak lignite mines the collective agreements reduce this period to 46 hours by shortening the Saturday shift. In the Netherlands the working week is 58 hours.

In underground workings the statutory working day is 8 hours in Austria, Czechoslovakia, France, Germany, Greece,

Italy, Poland (6 hours on Saturday), Spain, and Yugoslavia. The collective agreements also prescribe an 8-hour day in the central mines of the central German coalfield, and in Austria, Czechoslovakia (6 hours on Saturday in most mines), Poland (6 hours on Saturday), and Yugoslavia. In the outlying mines of the central German field the working day fixed by collective agreement is 8½ hours. In Hungary, the various works regulations prescribe an 8-hour day ; one small mine in the Sajomellék field, employing 67 workers underground, has a 10-hour day, but this includes a break of one hour. The working week is fixed by law at 48 hours in Czechoslovakia, Greece, Italy, and Yugoslavia, and at 46 hours in Poland. The Italian and Yugoslav collective agreements also prescribe a 48-hour week ; the Polish and most of the Czechoslovak agreements a 46-hour week.

Thus the working day is shortened by two hours on Saturday in all the Polish mines and in most of the Czechoslovak mines. In central Germany the Saturday shift is shortened in undertakings where work is not continuous.

In underground workings the length of the working day is computed differently in different countries. In Austria, Germany, Greece, Italy, and Poland, the length of the working day or shift is calculated separately for each worker from the time of entering to the time of leaving the shaft or adit, thus including both individual winding times (descent and ascent). In Czechoslovakia, France, Hungary, Spain, and Yugoslavia, the shift is calculated collectively. In France and in the few Yugoslav mines where cage winding exists it includes both winding times of all the workers in the shift. In Spain and in the Yugoslav mines in which there is no cage winding, only the descent is included in the length of the shift. The collective and individual winding times vary widely owing to the great differences in the depth of the mines, the nature of the approaches, and the number of men in a shift ; but generally they are shorter than in hard-coal mines because lignite mines are as a rule smaller, with fewer workers, and not so deep.

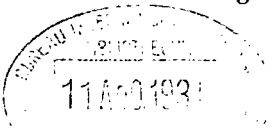
The hours of work mentioned above apply to all underground workers and all surface workers alike in Austria, Czechoslovakia, France, Germany, and Yugoslavia. In these countries there are no classes of workers or of work for which the regulations provide for working hours longer than the normal. In the Netherlands an exception is made for workers employed in

looking after the various machines ; these men work 12 hours a day, but this period includes the rest pauses taken individually according to circumstances. In Poland, the law provides for longer hours for preparatory or supplementary work (not exceeding 10 hours in 24 or 8 hours on Saturday), and for supervisory work (not exceeding 12 hours in 24).

Breaks.

In nearly all the countries the workers have a rest period either individually or collectively in the course of the working day. Sometimes this rest period itself constitutes an interruption in the working of the mine ; sometimes it coincides with an interruption made for technical reasons, such as blasting, waiting for tubs, etc. Rest periods coinciding with stoppages necessary for the working of the mine are always included in hours of work. Breaks in the strict sense, granted to the workers individually or collectively to enable them to have their meals, are excluded from hours of work only in Germany, Greece, and Spain. In these cases the length of the shift is increased by that of the break. In Germany, where these breaks are collective, the working of the mine is stopped for thirty minutes in the open mines of the Rhineland coalfield and the underground mines of the central German coalfield, and for sixty minutes in the open mines of the central German coalfield. In Spain the law provides that breaks granted to workers inside the mine to enable them to have meals or to rest are not included in hours of work, but that interruptions outside the workers' control and imposed by technical requirements are so included. In Greece the hours of work are hours of actual work, and do not include rest periods or interruptions in the working of the mine, which must be posted up. The Office, however, has no statistics relating to the application of these provisions in the last two countries mentioned. Finally, in some French mines, representing less than 1 per cent. of the total production of lignite, the shift is worked in two spells separated by a collective break of an hour for a meal to be taken at the surface ; this hour is not counted in the shift.

In the open mines in Austria and Czechoslovakia, hours of work include breaks. For Austria, the length of the breaks is not known ; in Czechoslovakia it is fifteen minutes, and has to be placed after the fourth or fifth hour. In underground mines



the working day includes a break of thirty minutes in Austria and France, from fifteen to twenty minutes in Poland, and at least fifteen minutes in Czechoslovakia. In the Hungarian mine of the Sajomellék coalfield the working day, which is fixed at 10 hours, includes a break of one hour. In Yugoslavia the breaks depend solely on working requirements ; each shift includes at least one or two breaks of from fifteen to twenty minutes each for blasting. These breaks are collective in France, Germany, and Yugoslavia ; elsewhere they appear to be individual and are arranged to fit in with the needs of the working of the mine.

Overtime.

Overtime is everywhere a matter of statutory regulation, except in Hungary, where it is dealt with in the works regulations in force in each mine. The statutory provisions are found in the national laws on hours of work in industry generally or in mines. Within the framework thus set up, overtime is sometimes regulated collectively by the parties concerned, as, for instance, in Czechoslovakia and Germany. This regulation by agreement is of particular interest, for it is the system most closely adapted to the actual circumstances of the industry. The collective agreement for the central German lignite field lays down that overtime shall be worked only in emergencies or for the maintenance of the undertaking. Apart from unforeseen circumstances and the demands made by the normal alternation of shifts, the management, in agreement with the workers' representatives and with due regard to the statutory provisions, decides which workers are to be employed overtime. All members of the staff who are capable of performing the work required must be chosen in turn. The collective agreement for the Rhineland lignite field prescribes that overtime and extra shifts are to be avoided ; in particular, extra shifts may not be worked by workers who have voluntarily missed one or more shifts during the week. When overtime or extra shifts are regularly employed for specific tasks, they must as far as possible be distributed equally among all the workers concerned. If this provision is not carried out, the works councils must see that no favouritism is shown except so far as is demonstrably in the interests of the industry. In case of need, the management of the mine may require 3 hours' overtime a week subject to the payment of the prescribed higher rate.

The works regulations applied in conjunction with this agreement provide that in the case of actual danger to the lives of the workers or the safety of the undertaking, every worker shall be obliged to work longer than the normal shift, at the discretion of the management. Finally, for all the German lignite fields, it should be noted that the extension of the normal working day beyond 8 hours follows from the operation of certain agreements or arbitration awards on additional work that are in keeping with economic necessities. In Czechoslovakia the collective agreements in force in the northern Bohemian and Falknov coalfields provide that overtime and extra shifts shall only be worked subject to the relevant provisions of the general legislation on hours of work. However, according to information furnished by the Czechoslovak Government, overtime is in practice used only for repair work that is indispensable for the continued working of the undertaking, and in cases of threatened danger.

The special mining legislation in force in Austria, France, Greece, and Spain provides for certain exceptions.

In Austria hours of work may be extended in the form of overtime : (*a*) for work of recognised urgency on account of serious danger threatening the life or health of the workers, or indispensable for the maintenance and continuity of working of the mine ; (*b*) in places where, for reasons of safety, it is impossible to relieve the workers employed at the working face ; (*c*) for work which must be carried out before or after the normal day, provided that such prolongation does not exceed 2 hours. The hours of work of carters, drivers, motor drivers, horse keepers, messengers, the staff of mine railways, persons employed on the distribution of foodstuffs, and all persons employed in mines whose work cannot be precisely limited, may be extended by not more than 16 hours a fortnight. In mines where the working depends on the season or the temperature, the Minister of Commerce, Industry, and Public Works may, after consulting the miners' trade unions, authorise an extension of the working day by not more than 2 hours. The number of hours of overtime so authorised may not exceed 180 a year. Lastly, the Secretary of State for Commerce, Industry, and Public Works may, in the public interest, authorise exceptions after consulting the mine-owners and with the consent of the miners' unions.

In Spain the working day may be extended: (*a*) when human life or property is in imminent danger, or when accidents occur that require immediate action; in such cases, as in cases of *force majeure,* and whenever it is necessary to avert actual or possible danger, the mine-owners may prolong the working day on their own responsibility, until they obtain the sanction of the Governor to do so; (*b*) in mining undertakings where, owing to their topographical situation, it is impossible to work more than six months in the year; (*c*) when, for technical reasons, the maintenance of the statutory maximum working day would make it impossible to continue the working of the mine. In the last two cases overtime may not exceed one hour per day or 6 per week. The exemption is granted by the Minister of the Interior after consulting the Mines Council and the Superior Labour Council. In the third case the exemption is temporary, and is granted for a period not exceeding six months, but it may be renewed in case of exceptional necessity.

In France overtime is authorised only in the case of accidents, actual or threatened. In Greece the normal hours of work may be exceeded in the case of accidents, actual or threatened, or for urgent work on machinery or equipment, or in the case of *force majeure,* but only to the extent required to prevent serious disturbance to the normal working of the undertaking.

In the other countries the general legislation provides for exceptions applicable to all industries; lignite mines can take advantage of them to the extent needed to meet their special requirements. It should be noted that most of these laws authorise exceptions for preparatory and supplementary work, in the case of accidents, actual or threatened, for urgent work on equipment, and in cases of *force majeure,* with a view to preventing serious disturbance to the normal working of the undertaking.

Exceptions are generally made to depend on compliance with certain formalities, such as request for authorisation, or a notification addressed to the competent authorities.

Finally, in certain cases overtime is remunerated at a higher rate. In Germany the increase is 15 per cent. for the so-called "additional" work, and as a rule 25 per cent. for overtime proper; in Czechoslovakia it is 25 per cent.; in Austria and Yugoslavia 50 per cent.; in Poland 50 per cent. for the first 2 hours and 100 per cent. for the remainder. In Spain the increase must be fixed by agreement between employers and workers.

Other Conditions of Working and of Labour in Lignite Mines

In underground lignite mines the conditions of working of undertakings, as we have seen, vary very widely. The causes of difference include the depth of the deposits, the nature of the approaches (shafts or adits), the nature of the fuel, and the geological characteristics of the ground in which the deposits lie. While in some mines the risks are those common to all underground workings, other mines have specific risks of their own. Thus, several lignite mines in the Esztergom field in Hungary have to reckon with the risk of sudden flooding through the bursting of water pockets ; and of fire through the combustion of carboniferous shale, beds of which are intercalated between the seams of lignite. The liassic coal mines of Pécs, also in Hungary, are subject to bags of firedamp and to dust explosions. However, as regards accident risk most of the statutory regulations on safety in mines make no distinction between lignite mines and hard-coal mines. This is so in Austria, France, Italy, and Spain. But it should be observed that this identity of the general safety regulations is not an accurate index of the magnitude of the risks in lignite and hard-coal mines respectively. In fact, the circumstances of each mine determine the details of the particular application of the general regulations.

It is only in Czechoslovakia, Germany, Poland, and Yugoslavia that there are differences between the statutory regulations on safety in hard-coal mines and in lignite mines. In Germany certain provisions on safety applicable to hard-coal mines do not apply to lignite mines, or are applied to them less strictly, in particular for risks in connection with ventilation, dust, firedamp, and cage winding. For instance, the police regulations authorise natural ventilation in underground lignite mines, whereas this is forbidden or is in fact impossible in hard-coal mines. Unlike hard-coal mines, where protection against coal dust is an extremely important matter, and has for some time been effected by stone-dusting, underground lignite mines are free from coal dust, and there are no statutory regulations about it. As lignite contains from 55 to 60 per cent. of water, it does not, in its crude form, tend to produce dust. In underground lignite mines the danger of firedamp is non-existent. In them lamps with open flames are allowed by the regulations, and the detailed regulations concerning firedamp applicable to hard-coal

mines do not apply to them. In lignite mines cage winding is used only to a limited extent, access to the underground seams being usually by horizontal or inclined adits. Owing to the shallowness of the shafts, the conditions imposed by the safety regulations for the conveyance of workers are not so strict as in underground hard-coal mines, in which the detailed safety regulations respecting the conveyance of workers in cages are rigorously applied.

In Poland, where both hard-coal and lignite mines are subject to the same regulations, the difference between the accident risks is reflected in the classification of the mines by degree of risk, hard-coal mines and lignite mines being in different categories.

In Czechoslovakia, in addition to the general safety regulations issued in each district by the mining authorities and applying without distinction to lignite mines and hard-coal mines, there are special rules issued by the same authorities for certain coalfields, groups of mines, or even single mines. These rules either reinforce or mitigate the general regulations. Since each coalfield has its own characteristic dangers, equally as its own characteristic advantages, it should not be inferred from any disparity between these rules that the degree of safety is higher or lower in hard-coal mines than in lignite mines. Czechoslovakia has compiled statistics of the number of fatal accidents in these two branches of coalmining, which provide a certain means of estimating the magnitude of the respective risks. From 1921 to 1928 the average annual number of fatal accidents per 10,000 workers (manual, clerical and supervisory) was 11.1 in hard-coal mines and 10.3 in lignite mines.

In Yugoslavia the regulations concerning safety in lignite mines are in general the same as those for hard-coal mines, but they are less severe on certain points, in particular ventilation.

From the information furnished by some countries (Czechoslovakia, Germany, Hungary, Poland, and Yugoslavia), it would also appear that accident risks are less in lignite mines than in hard-coal mines, especially with regard to ventilation, dust and firedamp. In Yugoslavia, however, it is considered that the risks of falls of roof and of fire are greater in lignite mines than in hard-coal mines.

With respect to occupational diseases, there appear to be none that are specific to lignite mines. Even ankylostomiasis does not seem to be endemic in any of them, only a few rare cases having

been known. No Government has thought it necessary to compile statistics of occupational diseases in lignite mines or to make a comparison in this respect with hard-coal mines.

Review of the Arguments in the Light of the Facts, and Possibilities of International Regulation

Before examining in the light of the facts the various arguments put forward, and estimating their value, at least so far as the facts themselves are conclusive, it is necessary to refer once again to the complexity of the lignite problem—a complexity due to the great variety of lignite and of its properties (notably its calorific value), which causes a corresponding diversity in its industrial use; to the variety of the natural conditions of the deposits and of the conditions in which they are worked; and to the diversity of the economic interests involved. It is thus easy to understand that the contradictory views put forward at the Preparatory Technical Conference and the International Labour Conference are all founded on definite facts. It is absolutely necessary to take the complexity of the problem into account in any attempt to offer an opinion or propose a solution.

Some arguments were based on the difficult situation, from the national standpoint, of the lignite industry as compared with the hard-coal industry. This difficulty can hardly be raised except in Czechoslovakia and Germany; elsewhere it is practically non-existent. In France, the Netherlands, Poland, and Spain, in fact, the lignite industry is sporadic, hardly meeting any but local needs and not in serious competition with the hard-coal industry on the home market. In Austria, Bulgaria, Greece, Hungary, Italy, Rumania, and Yugoslavia, the output of hard coal is negligible, if not nil; and lignite competes, to a greater or less extent, not with native but with foreign hard coals. In Italy, too, hydraulic power is a serious competitor of lignite for generating electricity.

In Czechoslovakia and Germany the production of lignite is increasing steadily, parallel with, and even faster than, that of hard coal. Czechoslovak lignites, having a comparatively high calorific value, are better able to hold their own against the native hard coal. German lignite has a lower calorific value, but on the other hand it is easy to mine. How far does one of these properties compensate the other? It is impossible to give a

definite answer without knowing the cost price per thermal unit of lignite and hard coal respectively. This information is not available for hard coal ; but it should be noted that in Germany, even in the Rhineland, the most highly industrialised part of the country, lignite has replaced hard coal in some of its industrial applications.

The special position of the lignite mines on the outskirts of coalfields as compared with those in the centre deserves some attention. This case especially concerns central Germany, where, for the reasons already stated, underground or mixed mines on the outskirts of the coalfield seem to be at a disadvantage as compared with the open mines in its centre. In the absence of detailed statistics of the cost price of lignite in these different mines, this point unfortunately cannot be settled.

Finally—still with reference to Germany—it should be asked whether, on the German market, the price of lignite is not mainly determined by the cost price of the fuel extracted from the open mines, representing nine-tenths of the total. If this is so, the price of underground lignites is likely to be less profitable than that of surface lignites ; and the less favourable the natural and technical conditions of the underground mines, the greater will be the difference. It should also be noted that from 1926 to 1929 production increased by about 37 million tons, or 30 per cent., in open workings, while it diminished by over a million tons, or 6 per cent., in underground workings.

From the international standpoint the commercial effects of lignite on the coal market call for the following remarks and reflections.

The quantity of lignite mined in Europe in 1929, expressed in terms of hard coal, was approximately 61,000,000 tons, which is more than the whole French output of hard coal. Of this total, 39,000,000 tons came from Germany and more than 13,000,000 from Czechoslovakia, or more than five-sixths of the total European production from these two countries alone. Thus, among the countries exporting hard coal, only Germany and Czechoslovakia produce an important quantity of lignite. Assuming that the output of lignite is consumed entirely by the home market, it will be seen that the amount of hard coal it sets free is considerable. It may be affirmed that the production of lignite has occasioned the starting of certain industries that now consume large quantities of this fuel ; that these industries would not have been

started without lignite ; so that if lignite were not produced the fuel requirements of home industry would be less and therefore the quantity of hard coal released for exportation would be the same. And it is quite true that lignite has occasioned the starting of new industries, in the central German coalfield, for instance ; but, on the other hand, is it not a fact that certain industries established near fields of hard coal—for instance, in the Rhineland—have given up hard coal and now use lignite ? There is also the use of lignite in domestic heating : the use of lignite briquettes is steadily increasing, especially in Germany. It therefore seems that the mining of lignite in countries that produce hard coal does set coal free for export. Could it be otherwise in face of the fact that in Austria, Bulgaria, Hungary, and Yugoslavia the production of lignite has substantially reduced the imports of hard coal ?

In addition lignite has a direct, although a limited, influence on the coal market : foreign trade in lignite, either in the crude form or in briquettes, represents 3 per cent. of the total production, or approximately 6,000,000 tons.

Lastly, among these economic considerations prominence should be given to the indisputable importance of lignite obtained from open workings, especially in Germany.

In the social sphere, certain facts are patent. In the first place, in no country does the legislation on hours of work make any distinction between hard-coal mines and lignite mines ; it applies to both alike without distinction. In certain countries, however, where there are both lignite and hard-coal mines, regulation by collective agreement is effected for each class separately. In Germany and Czechoslovakia, the only two countries in which lignite and hard coal both play an important part, there are some differences between the respective collective agreements. These differences are of small importance in Czechoslovakia, where they relate exclusively to Saturday work. They go farther in Germany, where hours of work are longer in underground lignite mines than in hard-coal mines, since a break of about thirty minutes is included in the length of the shift in hard-coal mines, but not in lignite mines. Further, in the central German coalfield hours of work in the outlying underground mines are half an hour longer than in the central underground mines. In other countries the agreements, in dealing with hours

of work, usually refer to the statutory provisions in force, and when this is so the same regulations apply to all mines.

In favour of the exclusion of lignite mines from a Draft Convention it has been pointed out that the number of workers employed underground in them is small. This is true for Germany, where in 1929 only 17 per cent. of the miners worked underground; but in Austria, Czechoslovakia, France, Hungary, Italy, and Poland, on the contrary, nearly 70 per cent., and in Yugoslavia about 50 per cent., of the lignite miners work underground. In all, about 90,000 workers are employed underground in European lignite mines and would consequently be covered by a Convention applying to underground lignite mines. This figure is worthy of note: it is higher by 10,000 than the total number of miners employed underground in the hard-coal mines of such an important coal-producing country as Poland. It is also true that from the standpoint of the protection of labour the exclusion of lignite mines would have very different effects in different fuel-producing countries, since the ratio of underground workers to all workers varies widely. It is thus possible to understand the insistence of the Czechoslovak workers' delegates, for instance, for whom the exclusion of lignite would mean that about one-third of the underground workers in Czechoslovak coal mines would be excluded from the benefits of the Convention.

From the technical standpoint, it is quite true that most lignite is mined at the surface; but it should be observed that the underground production of lignite nevertheless amounted to 54 million tons in 1929 and that, generally speaking, this lignite has a much higher calorific value than lignite from open workings. Further, Germany is the only country in which underground production is not greater than surface production, the latter, indeed, being practically non-existent in certain countries (Hungary and Yugoslavia).

That the calorific value of lignites is ordinarily low may also be admitted. In Austria, Hungary, the Netherlands, and Yugoslavia there are lignites whose calorific value is not more than 2,500 calories; and most of the German lignites, representing 80 per cent. of the total European production, have an average calorific value of 2,200 calories; but in Austria, Czechoslovakia, France, Greece, Hungary, Italy, Poland, Spain, and Yugoslavia there are other lignites yielding 4,000 calories and even more.

These are decidedly high-grade fuels. And as for the Spanish lignites of 7,000 calories, the Italian lignites of 7,400 calories, and the Yugoslav lignites, which the national statistics classify as hard coal when the calorific value reaches 6,000 calories, are they not in practice substitutes for hard coal ?

As regards average output, in Germany, in 1929, it was 4,300 metric tons per man-year in open workings and 1,200 tons in underground workings. In the Netherlands, the output at the surface is only from 2,500 to 2,700 tons ; and in most other countries the underground output does not seem to reach 300 tons. It is thus evident that here the German mines, both open and underground, are in a strong position : in Germany the miner extracts much more lignite, reckoned in terms of calories, than in any other country.

On the whole, the underground mining of lignite seems to be attended by fewer risks than hard-coal mining. But on this point it is particularly necessary to avoid hasty generalisations and categorical assertions. The mines of each coalfield have their own special conditions of operation. For example, the risks in the underground mines of Central Germany are obviously less than in the hard-coal mines ; but matters are very different in Austria, Czechoslovakia, and Hungary, where the difference in the risks of disaster in lignite and hard-coal mines from explosion, fire, and flooding appears to be small. Thus, in Czechoslovakia, from 1921 to 1928, the average number of fatal accidents per year in lignite mines was 10.3 per 10,000 workers, as against 11.1 in hard-coal mines. Finally, lignite mines do not present any special danger as regards occupational diseases.

As regards the difficulties that might be raised by the application of a system of regulations on hours of work to underground miners only in mixed mines, these do not appear insurmountable. It may also be observed that these difficulties have been referred to but not clearly specified. Exceptional cases apart, a shift is required to work for a certain time either underground or at the surface, and it does not appear that there would be any great difficulty in applying one or the other system of hours of work, as the case may be. Doubtful cases, where it would be difficult to decide whether a working face was in the open or underground, would also seem likely to be rare. These would be isolated instances that could be settled by reference to the general criteria employed to distinguish underground from surface

workings. However this may be, the argument is of secondary importance and cannot in itself justify an exception detrimental to thousands of workers.

Nor does the problem of distinguishing between lignite and hard coal appear to be insoluble. While it is true that certain lignites differ but little from hard coal and that the criteria used to distinguish them vary from country to country, it seems possible to establish a practical distinction between them, if this were necessary, by making the proposed regulations for lignite apply to all those kinds of coal which are not covered by the regulations applicable to hard coal, as it appears that the definition of the term " hard coal " has never been challenged as regards its scope.

In the preceding pages the Office has ventured to express on the arguments brought forward on various sides such opinions as seemed to be called for by the facts. There now remain for consideration the possible solutions.

In the first place, we can leave out of account the exclusion pure and simple of lignite mines from international regulation. It is only necessary here to recall the formal declarations of the German Government delegate in the Committee on Hours of Work in Coal Mines at the Fourteenth Session of the International Labour Conference. He made it clear that it has never been the intention of the German Government to leave lignite mines outside the scope of any and every Convention.

The solution therefore is not a negative one. As to a positive solution, it must be considered from two standpoints : the standpoint of substance and that of form.

As regards substance, it must be known which lignite mines international regulation should cover, whether underground mines only or all mines, i.e. underground, open, and mixed. For the economic reasons already mentioned, it would not seem possible to bring only underground mines under international regulation. Open mines are of primary importance in the total output of lignite, and logically speaking they could not be omitted from any regulations applying to underground mines, the working of which is appreciably more costly. That the International Labour Conference Committee on Hours of Work in Coal Mines was fully aware of this is clear, for the Draft Convention framed by it provided for discussion at the 1931 Session of hours of work in the " whole lignite-mining industry ".

With respect to the actual system to be applied to lignite miners, the question is whether or not it should be the same as that for hard-coal mines. So far as underground workers in the two industries are concerned, it hardly seems that the regulations should make any distinctions. At the most provision could be made for certain exceptions applicable to workers in a number of mines where work is carried on under particularly favourable conditions with respect to hygiene and safety. But in the view of the Office any discrimination at all between underground mines would be liable to give rise to serious difficulties of application. Surface workers in hard-coal mines and in underground lignite mines are not engaged in the actual production of fuel, whereas a large number of those employed in open lignite mines are. For the first class (underground mines), it does not appear desirable to have two different schemes, for coal and lignite respectively, applying to workers who are performing identical tasks either at the pithead or in ancillary establishments, such as screening, sorting, and drying plant and briquette works. For the second class (surface mines), a special system of regulations may be necessary, but this system itself may vary according as it applies : (*a*) to miners engaged directly in extraction, i.e. hand or machine hewing, and stripping the seams, which after all is similar work ; or (*b*) to those engaged in other work at the pithead or in ancillary establishments.

There is also the question of the form to be given to international regulations on hours of work in lignite mines. There are two possible alternatives : (1) to include such regulations in a general Convention on coal mining, or (2) to frame a special Convention for the lignite industry. If the first alternative were adopted we should have either : (*a*) a general Convention applying to underground workers only in all coal mines of every kind, and containing provisions for surface workers in lignite mines ; or (*b*) a general Convention applying to both underground and surface workers in all coal mines, and possibly containing special provisions for certain classes of lignite miners employed at the surface. If alternative (2) were adopted there would be two separate Conventions some of whose terms would be identical.

Such are, as the Office sees them, the possible solutions to the lignite problem, which will no doubt play an outstanding part in the discussions of the 1931 Session of the International Labour Conference.

APPENDIX

Wages in the Lignite Industry

For the principal lignite-producing countries of Europe certain data have been collected relating to the composition of wages in lignite mines. These data enable a distinction to be made between (*a*) net money wages corresponding to the work done, and (*b*) the various items that are added to the money wages to make up the workers' aggregate earnings (allowances in cash and in kind, social insurance contributions, payments for holidays). In most cases the figures are for the year 1929, but in some cases for 1928 and even 1927, so that they are not strictly comparable.

Generally speaking, however, it appears that net wages represent 80 to 90 per cent. of the total earnings excluding, or 70 to 80 per cent. including, employers' social insurance contributions. As a matter of fact, the chief item in aggregate earnings, apart from money wages, is social insurance contributions : in the majority of cases the workers' contributions amount to 6 or 7 per cent. of the total, while in Germany they exceed 10 per cent. ; and the employers' contributions seem to be slightly higher than the workers', except in Germany, where they are lower. Next come allowances in cash and in kind (free or cheap coal and housing), which form a substantial percentage of the total in Czechoslovakia (over 10 per cent.), France (a little less than 10 per cent.), Yugoslavia (8 per cent.), Germany (7 per cent.), and Hungary (6 per cent.).

In the countries in which lignite is worked both at the surface and underground wage regulations are the same in both cases. The only difference that can be pointed to is that in Germany underground workers are entitled to a slightly longer holiday than other workers after ten years' service.

The table on page 43 shows average earnings and output, per shift and per year, in lignite mines in the various European countries. All the figures are calculated from the data communicated by the Governments concerned. As stated above, international comparison is made more difficult by the fact that the figures do not all relate to the same year.

In conclusion, it has been thought interesting to give a more detailed survey of movements in the level of earnings and output in the two principal lignite-producing countries of Europe, namely, Germany and Czechoslovakia.

AVERAGE EARNINGS AND OUTPUT PER SHIFT AND PER YEAR IN LIGNITE MINES

Country and district	Unit of currency	Year	Average earnings, in national currency				Average output, in metric tons	
			Per shift		Per worker per year			
			Excluding: employers' contributions	Including: employers' contributions	Excluding: employers' contributions	Including: employers' contributions	Per shift	Per man-year
Austria	Sch.	1928	9.55	—	2,702	—	1.090	309
Czechoslovakia	Kč.	1928	44.73	49.65	12,095	13,427	1.893	512
France	Franc	1929	37.20	38.82	9,842	10,272	0.841	223
Germany [1]:								
Elbe coalfield:								
East bank	R. Mk.	1929	7.31[2]	—	2,193[2]	—	8.421	2,514
West bank	R. Mk.	1929	7.92[2]	—	2,327[2]	—	7.902	2,313
Rhineland coalfield:								
Left bank	R. Mk.	1929	8.97[2]	—	2,718[2]	—	24.002[4]	7,153[4]
Greece	Dr.	1929	50.00	—	—	—	—	88
Hungary	Pengö	1927	4.99	5.45	1,490	1,626	0.793	237
Italy	Lira	1929	16.45[3]	—	—	—	—	171
Netherlands	Guld.	1929	4.22[2]	4.60[2]	991[2]	1,080[2]	8.282[4]	1,835[4]
Poland	Zloty	1929	6.07	6.48	1,671	1,785	0.857	235
Spain	Peseta	1929	7.75	—	2,340	—	0.786	237
Yugoslavia	Dinar	1928	40.46	43.07	12,104	12,886	0.596	178

[1] The three German districts shown in the table provide about 80 per cent. of the total production of lignite.
[2] Including ancillary establishments.
[3] Wage rates for hewers.
[4] Open workings only.

AVERAGE EARNINGS AND OUTPUT IN THE LIGNITE MINES OF GERMANY AND CZECHOSLOVAKIA, 1925-1929

Germany

The following table shows movements in the level of earnings and output in the three chief German coalfields during the years 1925-1929. Figures are given for: (*a*) the average money earnings per shift, including workers' social insurance contributions and allowances in cash, but excluding allowances in kind and payments for holidays; (*b*) the aggregate income per worker per year, excluding employers' social insurance contributions; (*c*) the average output per shift and per man-year. All these averages are taken from the official mining statistics [1]; they apply to all workers employed in the mines. The

[1] *Statistische Nachweisungen über die Arbeitsverhältnisse und Löhne in den Hauptbergbaubezirken* (Beilage zum *Reichsarbeitsblatt*). *Zeitschrift für das Berg-, Hütten- und Salinenwesen im Preussischen Staate*, 1930, No. 78, 3. Stat. Lieferung (Ministerium für Handel und Gewerbe).

wage averages also include workers in ancillary establishments (coke ovens, briquette works, etc.).

AVERAGE EARNINGS AND OUTPUT IN THE PRINCIPAL GERMAN LIGNITE FIELDS, 1925-1929

District and year	Average earnings [1]		Average output, in metric tons			
	Money earnings per shift	Aggregate per worker per year	Per shift		Per man-year	
			Underground mines	Open mines	Underground mines	Open mines
	R.Mks.	R.Mks.				
Elbe coalfield (Halle):						
East bank: 1925	5.36	1,681	2.740	8.049	882	2,607
1926	5.69	1,739	2.856	9.049	898	2,937
1927	6.11	1,846	2.905	10.349	926	3,327
1928	6.85	2,126	3.175	9.708	1,013	3,159
1929	7.03	2,193	3.172	9.889	1,017	3,242
West bank: 1925	5.67	1,735	3.559	5.961	1,135	1,909
1926	6.13	1,828	3.696	6.343	1,180	2,031
1927	6.67	1,971	4.101	7.358	1,304	2,380
1928	7.40	2,252	4.198	8.073	1,334	2,625
1929	7.62	2,327	4.634	8.685	1,470	2,845
Rhineland coalfield:						
Left bank: 1925	6.92	2,136	—	14.719	—	4,711
1926	7.36	2,275	—	16.583	—	5,263
1927	7.81	2,396	—	21.431	—	6,786
1928	7.93	2,465	—	23.105	—	7,390
1929	8.63	2,718	—	24.002	—	7,709

[1] Including ancillary establishments.

The workers' earnings increased steadily from 1925 to 1929, the averages for the last of these years being about 30 per cent. higher than those for the first. The highest proportional increase was on the west bank of the Elbe, where it was 35 per cent.; the east bank of the Elbe came next, with 30 per cent., and the Rhineland district last, with less than 30 per cent. But it is in the Rhineland district, where all the mines are open, that wages and output are highest. Here, however, while average earnings are only 15 to 25 per cent. higher than in the other districts, the average output is more than double, and sometimes nearly treble. This district alone furnishes almost a third of the total production of lignite. Further, if the output of the underground mines is compared with that of the open mines in the two Elbe districts, it will be found that on the east bank the average underground output does not amount to a third of the surface output, whereas on the west bank it is more than a half. In the latter district about twice as much lignite is extracted underground as in the former, and about one-third more at the surface.

Lastly, it is not without interest to compare earnings and output in lignite mines with those in hard-coal mines in the principal districts producing these fuels.

AVERAGE EARNINGS AND OUTPUT IN GERMAN HARD-COAL AND LIGNITE MINES, 1925, 1927, AND 1929

Fuel and district	1925	1927	1929	1925	1927	1929
	Average money earnings per shift [1]			Aggregate earnings per worker per year [1]		
	R.Mks.	R.Mks.	R.Mks.	R.Mks.	R.Mks.	R.Mks.
Hard coal :						
Ruhr	6.91	8.04	8.90	1,955	2,304	2,586
Upper Silesia	5.16	5.94	6.74	1,511	1,745	1,963
Lignite :						
Elbe : East bank	5.36	6.11	7.03	1,681	1,846	2,193
West bank	5.67	6.67	7.62	1,735	1,971	2,327
Rhineland	6.92	7.81	8.63	2,136	2,396	2,718
	Average output per shift worked, in metric tons			Average output per man-year, in metric tons		
Hard coal :						
Ruhr	0,946	1,132	1,271	296	354	395
Upper Silesia	1,153	1,335	1,377	367	426	436
Lignite (underground mines) :						
Elbe : East bank	2,740	2,905	3,172	882	926	1,017
West bank	3,559	4,101	4,634	1,135	1,304	1,470

[1] Including ancillary establishments.

The average earnings per shift are highest in the Ruhr, followed closely by the Rhineland lignite field ; the two Elbe lignite fields come next, and the Upper Silesian hard-coal field last. For annual earnings the Rhineland field is above the Ruhr, but the order of the other three fields is unchanged.

With regard to average output, in the underground mines of the least productive lignite field (east bank of the Elbe) it is nearly 2½ times as much as in the most productive hard-coal field (Upper Silesia) ; and in the underground mines of the most productive lignite field (west bank of the Elbe) it is nearly four times as much as in the least productive hard-coal field (Ruhr).

Czechoslovakia

The following table shows movements in the level of wages and output from 1925 to 1929 in Czechoslovak coal and lignite mines, in the principal coalfields and for the country as a whole. Figures are given for average earnings per day and per year, including allow-

ances and other advantages of every kind, but excluding employers' social insurance contributions; the average output per day and per year on the basis of the net saleable tonnage has also been calculated. These averages apply to all workers employed in the mines. All the figures used are taken from official mining statistics. [1]

AVERAGE EARNINGS AND OUTPUT IN CZECHOSLOVAK HARD-COAL AND LIGNITE MINES, 1925-1929

Fuel and district	1925	1926	1927	1928	1929
	Average earnings per worker per day				
	Kč.	Kč.	Kč.	Kč.	Kč.
Hard coal :					
Ostrava-Karvina	43.45	47.33	47.25	48.77	50.04
Whole country	40.87	43.58	43.75	45.18	46.15
Lignite :					
Northern Bohemia	39.09	43.04	41.72	45.10	44.81
Whole country	38.65	41.75	40.73	43.31	43.28
	Average earnings per worker per year				
	Kč.	Kč.	Kč.	Kč.	Kč.
Hard coal :					
Ostrava-Karvina	10,630	11,915	11,501	12,358	13,492
Whole country	10,230	11,327	11,214	11,911	12,924
Lignite :					
Northern Bohemia	9,791	11,237	11,424	12,062	12,745
Whole country	9,851	10,985	11,190	11,797	12,313
	Average output per worker per day, in metric tons				
Hard coal :					
Ostrava-Karvina	0.925	1.080	1.066	1.100	1.168
Whole country	0.803	0.937	0.938	0.958	1.009
Lignite :					
Northern Bohemia	1.794	1.821	1.826	1.913	1.955
Whole country	1.782	1.804	1.823	1.893	1.938
	Average output per worker per year, in metric tons				
Hard coal :					
Ostrava-Karvina	226	272	259	279	315
Whole country	201	244	241	253	282
Lignite :					
Northern Bohemia	449	476	500	512	556
Whole country	454	475	501	514	551

[1] *Rapports de l'Office de statistique de la République tchécoslovaque* : "Statistique des salaires dans l'industrie minière", 1925-1929; "Statistique de la production des mines, . . . etc.", 1925-1929.

In both hard-coal and lignite mines wages and output, with very few exceptions, increased steadily from 1925 to 1929. But while average earnings in hard-coal mines are generally higher than those in lignite mines—though only slightly, it is true—the output in lignite mines is very nearly double the average output in hard-coal mines. It should, however, be noted that the averages for the output in lignite mines are for underground and surface mines taken together, it being impossible to determine exactly the figures for each separately. In any case, the surface mines furnish a large proportion, perhaps about a third, of the total production of lignite.