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MEMORANDUM

Fourth ECSC medical research programme
Effects on the health on workers of physical and
other occupational factors at the workplace

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occupational factors at the workplace

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I. INTRODUCTION

In accordance with the provisions of Article 55, § 2 of the ECSC Treaty on the promotion of research, further action is proposed in the field of occupational medicine.

The principles behind the work proposed by the Commission of the European Communities and the methods used to implement it are set out in the publication "The High Authority's Policy for the Promotion of Studies and Research on Industrial Health, Medicine and Safety" (+).

(+) Office for Official Publications of the European Communities
Luxembourg, 1966

This programme is concerned mainly with respiratory diseases. It has been drawn up in such a way that it replies to the wishes of the professions concerned. The Commission of the European Communities is aware that there exist other subjects in the field of occupational health that could have been included. Thus subjects such as cardiovascular disease and its effect on manpower in these industries, skin disease, and diseases of the vertebral-column are themes which are certainly worthy of closer consideration, and which could figure in a programme of action based on preparatory research included in this programme.

The new research programme is a follow-up work carried out during the past decade and although use is made of the scientific and practical information obtained, an essential feature is the broadening of its scope to cover, in ECSC undertakings, physical and other occupational factors at the workplace and problems associated with technological developments in production, processing and the use of products.

- a) Basic research into chronic respiratory diseases and their aetiopathogenesis has gradually been reduced over the years to leave more room for applied research. In the past, the emphasis has been on the aetiopathogenesis of types of pneumoconiosis, the cytotoxic properties of silica and the effects of various qualities of dust; recently research workers have turned their attention to the microbiology of bronchial and pulmonary cells in an attempt to discover treatments and cures and to investigate efficient preventive measures in association with early detection techniques.

From now on basic research must concentrate on the development of preventive measures and detection techniques. This will involve biological and therapeutic research into the biological interactions

in the mucous membranes of the respiratory tract, and the reactions and biological defence mechanisms of the individual.

- b) Respiratory function tests to establish individual respiratory capacity have been developed and diversified considerably over the past few years and this has made it possible to refine techniques already tested and develop new methods for the early detection of minor or incipient changes in respiratory function.

For the next few years a special effort must be made to standardize simple and reliable techniques for use by occupational physicians. Occupational physicians must be given tools which they can use on a large scale with maximum reliability in order to do the intensive prevention work required in the iron and steel industry and in coking plants and coal mines.

- c) For assessment of the extent of the various diseases encountered in the ECSC industries and identification of their causes, epidemiology has proved to be the essential scientific approach whereby medical knowledge can be advanced; it helps to pin-point the causes of diseases and identify the factors responsible for the strain and discomfort associated with specific tasks.

Epidemiological research, based on carefully defined criteria, must go hand in hand with both basic biological research and the study of the effects on the individual in his environment. The last two programmes have included important investigations of this kind into the frequency and aetiology of chronic bronchitis. In the next years, epidemiology will be extended to all nuisance factors in the ECSC

industries and their individual effects, and which could lead to new perspectives; the epidemiology of disease and mortality in the ECSC industries will be developed and comparisons will be made with the statistical data available on populations exposed or not exposed to other specific risks.

- d) In this programme research is no longer restricted to the specific problems of the respiratory tract but covers the chemical pollutants and climatic factors of each sector of ECSC industrial activity.

In line with its social research policy, the Commission has made a point of including as far as possible the research topics suggested by producers, workers and government representatives; occupational physicians have also been involved in the preparation of the programme. The intention is therefore to study new topics directly connected with working conditions but future research projects will nevertheless be submitted to advisory committees for assessment to ensure that the programme is sufficiently homogeneous to guarantee maximum efficiency (+).

In order to avoid too much diversification of effort and to make the best use of the information obtained, the programme is based mainly on the most recent results of medical research. The new topics reflect technological developments and the working conditions associated with these and mean that research in the years to come will be broader in scope.

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(+) Research projects which are recognized as important for occupational medicine but are not consistent with the broad scope of this programme may be considered by the CEC either for subsidies under this programme, if funds are available, or they may be judged priority projects and awarded special grants, depending on the opinion of the advisory committees.

II. NEW GUIDELINES AND BROADENING OF THE SCOPE OF THE PROGRAMME

- In the light of the most recent biological information, the scope of experimental and epidemiological research needs to be extended to all harmful agents in the working environment and individual sensitivity factors. These items must be investigated in much greater detail through epidemiological surveys taking into account not only identified and quantified agents but also the complex physical, chemical and climatic factors which can combine to produce effects which differ according to individual receptivity and reaction.

Special attention must be given to cancers and particularly to their early detection through research into the carcinogenicity of atmospheric pollutants in the ECSC industries taking all related pollutants and climatic factors into account.

Extending this programme also means developing a system of information and training for all those who are responsible for preventive medicine and the detection of occupational diseases in coal mines, iron mines, coking plants and iron and steel works. The aim is to improve the methods used by occupational physicians and safety engineers for qualitative and quantitative assessment of harmful agents in these industrial branches. Investigation techniques developed in laboratories must be used for medical surveillance and early detection of any change in health, so that the reliability of the tests and methods already used in practice can be assessed and checked. Finally, one of the objectives of this programme is to establish the orientations for future research.

- Where iron and steel works and coking plants are concerned, epidemiological, biological and functional research must take into account all operations which may have harmful effects on health and pay particular attention to the specific diseases found in blast furnaces, rolling mills and coking plants as a result of the climatic

conditions and toxic substances peculiar to these workplaces. This means gearing research more specifically to the diseases which the occupational physician is likely find in the iron and steel works and coking plants. Chronic bronchitis, because it is so common, will still be a central theme but works must also be done on the identification of toxic and carcinogenic substances.

- The study of chronic respiratory diseases in coal and iron miners is of prime importance in the ECSC industries. During this programme the many projects conducted during the past decade will be followed up methodically and carefully. Many problems remain to be solved and we still know very little about the causes of the often premature respiratory insufficiency from which miners suffer.

While respiratory function testing represents an important step, the gaps in our knowledge of lung disease caused by various types of dusts must also be made good through a coordinated study of agents and immunological effects; another important question is the radiological investigation of pneumoconiosis. Finally, an effort should be made to find out why young miners are losing interest in their work and determine the underlying causes of this psychological phenomenon and its connection with working conditions.

III. CONSULTATIONS WITH ADVISORY COMMITTEES

The ECSC Consultative Committee will be consulted about this programme as stipulated in Article 55, paragraph 2 of the ECSC Treaty.

Like the other research programmes launched since 1957 by the European Coal and Steel Community, this draft programme drawn up for the Commission of the European Communities by the Health and Safety Directorate will be submitted initially to the advisory committees working on social research for an opinion.

The Producers' and Workers' Committee on Occupational Safety and Medicine and the Committee of Government Experts on Occupational Medicine and Rehabilitation and Human Factors and Ergonomics will be consulted and the final programme will be based on the opinions of these two committees.

The topics and priorities of the programme therefore reflect the concerns of the occupational milieu involved and the needs of workers in terms of health, preventive medicine and medical surveillance.

The object is a scientific and practical approach to the diseases associated with the specific environment of the ECSC industries as a result of the harmful substances inhaled and the effects of climatic conditions and the working environment; the scope must be restricted in this way to produce a coherent programme and a concerted effort to ensure maximum success.

Many topics associated with occupational medicine are of course worthy of the consideration the professional organizations would like them to have and there are still a large number of problems outstanding.

The scope of this programme is determined by the resources and administrative work which the CEC can provide for the promotion of research in this field at the moment but this does not mean that research which proves in the next five years to be urgent and appropriate in the opinion of the professional organizations and the CEC will not be considered, under an administrative procedure designed for the purpose by the CEC.

The research must fulfil the needs of the workers and improve their physical and psychological working conditions. It must help to improve preventive medicine, early detection and treatment of occupational disease in coal mines, coking plants and iron and steel works.

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IV. COORDINATION OF WORK

Work will be coordinated, as on previous occasions, by the scientific committee set up for the duration of the programme by the departments of the Commission of the European Communities responsible for launching the programme and supervising it over the next five years.

In practical terms, the research is coordinated by the working parties set up at the beginning of the programme on the basis of the topics to be studied. These meet two to three times a year.

The members of the scientific committee for this programme are appointed by the departments of the Commission of the European Communities in consultation with the Producers and Workers and the Government Experts. Its members must be people experienced and qualified in the various sectors concerned in the programme.

V. JUSTIFICATION

- The first research programme, on silicosis and pneumoconiosis in coalminers, resulted in a better knowledge of the pathogenesis, radiological aspects, complications and functional repercussions of these diseases. Functional spirometry tests were standardized throughout the Member States of the Community.

- The second programme focused on chronic bronchitis and emphysema, which may accompany pneumoconiosis or develop independently and the socio-economic significance of which is well known. Basic research was done into these problems. A standardized questionnaire was developed in the various Member States with a view to carrying out epidemiological surveys of these disorders.

- The third programme, now coming to an end, focused both on pneumoconiosis and on chronic bronchitis and emphysema. As regards the latter diseases, the programme paid particular attention to the biological processes responsible for triggering them. Promising results were obtained concerning the value of certain new techniques which permit early detection and improved treatment of these diseases. The coal industry also launched a programme to rehabilitate bronchitis sufferers in the initial stages of the disease. At the same time work on harmonizing and standardizing respiratory function tests at Community level was continued.

Progress was made on the study and epidemiological monitoring of pneumoconiosis. Studies were also carried out on the preventive effects of P 204 and aluminium salts.

At the various meetings of the three Working Parties - WP on Physiopathology and Rehabilitation, WP on Basic Research and WP on Epidemiology - which included representatives of the occupational physicians in the coal and steel industries in the various Community countries, it emerged that chronic respiratory diseases were still a major cause of morbidity, both among miners and among workers in coking plants and in the iron and steel industry. Priority importance must still be attached to studies aimed at establishing the links between these diseases and characteristic workplace nuisances, in particular exposure to dust, fume and gases, along with the influence of other factors, such as temperature, humidity and air currents. These studies should provide the necessary data for social and political programmes to improve the environment and health of the labour force. The participants also acknowledge that other factors might be responsible for diseases in the two sectors in question. Thus, while research into respiratory diseases should be continued, the field of study should be extended to include other diseases of workers in steelworks, coking plants, coal mines and iron mines.

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Research work of this kind calls for a multidisciplinary approach, involving biology, epidemiology and respiratory function analysis. This threefold approach is indispensable for the development of effective preventive measures and methods of treatment.

a) Studies relating to the health and working conditions of workers in coal mines and iron mines, in coking plants and in the iron and steel sector

1. In the case of these studies one should bear in mind the extent to which biological research in recent years has improved knowledge of defence mechanisms and of the ways in which individuals react to aerogenic aggressions.

Animal experiments and the study of occupationally-induced biological disorders in workers have provided detailed information on the following aspects; without a knowledge of which adequate preventive and therapeutic measures cannot be implemented :

- the nature and the modes of action of the agents involved;
- the growing importance of individual sensitivity factors in the production of these reactions.

2. Moreover, epidemiology should make it possible to study, in these workers, the links between exposure to dust, fume, gases and climatic factors on the one hand and health on the other hand. This should enable the potential harmfulness of recently-developed mining techniques to be determined, in particular with respect to chronic bronchitis, emphysema and cancer.

3. As regards research into respiratory function, the following points should be stressed :

- new Community studies are necessary to evaluate techniques of early diagnosis of chronic bronchitis which can be applied at the workplace,

- at the same time the Community should encourage better information and training for doctors and paramedical staff responsible for carrying out these tests,

- finally, there is a need to study new and more sophisticated tests, which cannot be applied at the workplace, with a view to assessing disability and the results of treatment; these laboratory tests will also permit the assessment of simpler tests usable at the workplace.

b) Studies relating specifically to workers in the iron and steel sector and in coking plants

1. The epidemiological approach would seem to be particularly important for these workers for three reasons :

- this approach enables the relevance of chronic respiratory diseases to overall chronic disease in workers in these sectors to be determined;
- this approach will also provide a better understanding of the health hazards associated with specific types of work in these industries, in particular the hazard of bronchopulmonary cancer; the main areas involved are welding operations, work involving exposure to iron dust at blast furnaces, to graphite dust during pig-iron desulphurization or to oil aerosols during cold-rolling, and operations carried out at high temperatures, etc.;
- finally, epidemiological studies are particularly useful in studying potentially toxic substances, such as chrome or nickel in particular.

2. Biological and respiratory function studies should also be carried out in this field; these different techniques are indispensable for determining anatomical and functional disorders induced by the various factors referred to above.

c) Research relating specifically to coal and iron miners

1. Little is yet known about the causes of the respiratory insufficiency - sometimes premature - which is associated with characteristic jobs in these sectors. These disabling disorders seem to be linked both to pneumoconiosis and to conventional chronic bronchitis, to bronchiolitis, or to other factors - in particular vascular - yet to be specified. Studies in this field

should draw simultaneously on epidemiological, biological and functional investigative techniques with a view to obtaining a clearer picture of the nature of these disorders, determining how they can be prevented and treated, and specifying the extent to which they should be taken into consideration for purposes of compensation.

2. In countries in which young people are again entering the mining sector one frequently hears the complaint that these young miners abandon their trade at an early age; as this situation may partly be due to the environmental and atmospheric conditions, one remedy might be found in improved evaluation of their working conditions, in conjunction with a study of respiratory function.
3. The recent development of pneumoconiosis in the EC Members States again raises certain pathogenic problems which were thought to have been solved, notably as regards the contribution of dust, silica and various co-factors, particularly of an immunological nature, to the production of these disorders. In particular, studies in this field should help to explain the causes of late pneumoconiosis, which seems to be becoming particularly frequent in certain areas of the Community. These studies draw on epidemiological and biological techniques. The reclassification of affected workers is also being considered.
4. Finally, the recent revision of the ILO international classification of radiographs of the pneumoconiosis has left a number of problems unsolved. In particular, there is a need to define model films whose purpose is to determine the limits between various categories of simple pneumoconiosis. This is a basic problem, the solution of which will facilitate comparison of the epidemiology of pneumoconiosis and thus contribute to its prevention in the different Community Member States.

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Annex

Fourth ECSC medical research programme

Effects on the health of workers of physical and other occupational factors at the workplace

a) Studies relating to the health and working conditions of workers in coal mines and iron mines, in coking plants and in the iron and steel sector

1. Research into the biological processes, including individual factors, responsible for the appearance and development of emphysema and chronic bronchitis in these workers. Application of this research to the prevention and treatment of these diseases.
2. Standardization and implementation of workplace tests conducted for the early diagnosis of chronic bronchitis and emphysema.
3. Evaluation of techniques and of the results of various preventive and therapeutic measures applied to persons suffering from respiratory diseases in their early stages.
4. Evaluation of the results of function tests at rest and during exercise with a view to determining working capacity, in particular the residual working capacity of workers with respiratory disorders, in the light of the physiological requirements of certain workplaces.
5. Preparatory research into cardiovascular disease and its effect on manpower, skin diseases and diseases of the vertebral column.

b) Studies relating specifically to workers in the iron and steel sector and in coking plants

1. Epidemiological studies of the main causes of disease and death in the iron and steel industry and in coking plants and of how they correlate with working conditions (gases, fume, temperature, humidity, air currents, etc.).

2. Study and prevention of the specific health risks, including the risk of bronchopulmonary cancer, associated with certain characteristic operations in the iron and steel industry and in coking plants, such as

- welding work;
- work involving exposure to iron dust at blast furnaces;
- work involving exposure to graphite dust during pig-iron desulphurization;
- work involving exposure to oil aerosols during cold-rolling;
- work involving exposure to high temperatures, etc.

3. Identification of the hazards associated with potentially harmful substances such as nickel, chromium and other substances used in alloys, with a view to determining whether existing threshold values for exposure involve a health risk.

c) Research relating specifically to coal and iron miners

1. Study of the causes of respiratory insufficiency which is responsible for disability (sometimes premature) in characteristic jobs in those sectors. Prevention and treatment.
2. Epidemiological studies of the main causes of disease and death in coalminers and iron miners, and their relationship with working conditions (gases, fume, temperature, humidity, air currents etc.).
3. Study of the contribution of silica, other dusts, and exogenous and endogenous co-factors to the abnormally rapid appearance and development of simple pneumoconiosis and massive progressive pneumoconiosis. Prevention of such development. Reclassification of affected workers.
4. Validation, at Community level, of the ILO international classification of radiographs of the pneumoconiosis (revised in 1980) including a study of the value of model films illustrating the limits between the categories.

VI. IMPLEMENTATION OF THE PROGRAMME

The Committee of Scientific Experts advises the Commission, on a permanent basis, on the scientific aspects of the various research projects for which financial aid is requested.

To implement the programme, the CEC will, as on previous occasions, call upon research institutes in the member countries to help, after the Commission of the European Communities has pronounced on this Memorandum.

As the topics of this programme cover more ground than those of previous years, a larger scientific committee instituted at the beginning of the new programme will be asked to help the Commission form opinions on scientific aspects of the research projects. After studying the projects, the Producers' and Workers' Committee and the Committee of Government Experts will be asked to give their opinions. These opinions determine whether or not financial aid is to be awarded according to the specific criteria of the ECSC industries.

During the work, working parties chaired by Commission representatives and assisted by the scientific committee will meet regularly and distribute the interim results to scientific and professional bodies, thus encouraging a continuous exchange of information between the research institutes and the circles concerned.

When the research programme has been completed, the scientific committee will help to arrange seminars and publish the results; the various research institutes which have received financial aid during the programme are required to make their research findings available to the Commission of the European Communities and the scientific committee so that these may be distributed with a view to practical application.

VII. FINANCING AND DURATION OF THE PROGRAMME

It is estimated that implementation of the fourth ECSC medical research programme on the Effects on the health of workers of physical and other occupational factors at the workplace will cost 9 million ECU over five years. This is based on the following :

- 1°) The programme proposed is both an extension of the preceding programme (for which 5 million ECUS were awarded for four years) and an exploration of new topics as shown in this Memorandum.
- 2°) The scope of research into preventive medicine and the improvement of working conditions will go on developing in all the fields covered by the programme.
- 3°) Research costs have increased considerably in recent years. This means that the research projects submitted to the Commission of the European Communities must be carefully selected.

A concerted effort must be made if practical objectives are to be achieved through coordinated and efficient development.

With this financial aid the research programme will cover, in addition to direct aid to the institutes, all administrative costs arising from :

- scientific coordination and cooperation
- experts' and research workers' visits
- publication and distribution of reports
- bibliographical documentation, etc....

Furthermore, the institutes benefitting from financial aid contribute to the cost of the research by making their own research workers, scientific equipment and financial resources available to the Commission of the European Communities.

In view of all these factors, the budget for this research project amounts to a total of 9 million ECU for five years. As in the past, Community aid represents only a portion of the funds necessary for the various research projects.

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CONCLUSION

The Commission of the European Communities :

- in view of the need to encourage medical research dealing with the Effects on the health of workers of physical and other occupational factors at the workplace in ECSC undertakings and to promote research projects to improve health and well-being in these undertakings;
- account being taken to of the favourable opinion and approval of the Producers' and Workers' Committee and the professional and government representatives;
- having regard to Article 55 of the Treaty instituting the European Coal and Steel Community;
- proposes an appropriation of 9 million ECU over five years for the implementation of the fourth ECSC medical research programme on the Effects on the health of workers of physical and other occupational factors at the workplace in ECSC undertakings.

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