

FOREWORD

This report is one of a series written by members of the Solid Fuels Mission to Germany describing wartime developments in the mining, preparation, and utilization of coal. This mission was organized early in 1945 under the auspices of the Technical Industrial Intelligence Committee, which cooperated with a counterpart British committee. In some instances, engineers from other allied countries cooperated. The Solid Fuels Mission operated under the direction of a steering committee headed by Dr. C. J. Potter, Deputy Solid Fuels Administrator. The personnel of the mission consisted of J. W. Buch, Thomas Fraser, L. L. Newman, L. D. Schmidt, and H. F. Yancey of the Bureau of Mines; H. H. Lowry, Director of the Coal Research Laboratory, Carnegie Institute of Technology; H. J. Rose, Vice-president and Director of Research, Bituminous Coal Research, Inc., and M. F. Reed, Chief Chemist, Illinois Geological Survey.

Over 50 reports were written by the members of the Solid Fuels Mission. These reports, together with microfilms of supporting data obtained in the course of the investigations, are on file at the Bureau of Mines, Washington, D. C., where they are available for public examination. The Office of the Publication Board in the Department of Commerce is prepared to furnish photolith copies, photostats, or microfilm reproductions of all declassified reports. A Bibliography of Scientific and Industrial Reports is issued weekly by the Department of Commerce, Office of the Publication Board, and is sold by the Superintendent of Documents, Government Printing Office, Washington 25, D. C., on a subscription basis. An initial payment of \$10 will provide for approximately 9 months, and subscribers will be notified when additional remittance is necessary. All subscriptions will begin with volume 1, No. 1, unless ordered otherwise. The Bibliography covers all materials and subjects and gives instructions for obtaining the desired items.

The reports of the Solid Fuels Mission relate to the following general subjects: viz., Mining methods in the Ruhr district of Germany, with special reference to mechanical cutting and loading equipment, pneumatic packing, and Diesel mine locomotives; activities of industrial research laboratories supported by the German coal and coke industry; coal preparation in Western Europe; low-temperature carbonization processes; metallurgical coke from weakly coking coals; low-ash electrode carbon from coal; new developments in the production of metallurgical coke and the utilization of gas and by-products; briquetting brown coal and bituminous coal without the use of binders; recent engineering developments in gas turbines and steam generators with special reference to use of coal; German coal-fired heating and cooking stoves; and the commercial extraction of coal with solvents for production of synthetic liquid fuels or chemical products.

Numerous reports on the activities of German synthetic liquid fuels plants and the plants for the production of synthesis gas from solid fuels are available in the same office as the solid fuels reports.

It is planned to publish in this series of Bureau of Mines Information Circulars the more important reports or combination of reports prepared by the members of the Solid Fuels Mission. A similar series on synthetic liquid fuel activities is being prepared.

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Fuels and Explosives Branch:

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INFORMATION CIRCULAR

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SOME OBSERVATIONS ON GERMAN COAL RESEARCH AND DEVELOPMENTS^{1/}

By H. H. Lowry^{2/} and H. J. Rose^{3/}

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INTRODUCTION

Considerable information on the organization of German fuel research and recent developments was obtained and published in several combined Intelligence Objectives Sub-Committee Reports. This material, although available in the initial reports, has never been consolidated, so that it may not have come to the attention of many readers. This report gives a summation of the authors' observations at six different research laboratories.

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FUEL TECHNOLOGY AND THE REICHSVereinigung KOHLE^{4/}Conclusions

The Reichsvereinigung Kohle and the associated (?) organization Reichsstelle für Kohle do not partake directly in technical matters to the same extent as did the Reichskohlenrat, which they superseded in 1939. Dr. H. Schwarzkopf, formerly Secretary of the Reichskohlenrat and now in charge of fuel technology for the Reichsvereinigung Kohle, remains an important source of information on German fuel technology. The original C.I.O.S. report^{4/} and T.O.M. reel 70 give detailed information on the organization structure, co-operating institutions, and research projects.

The objective of the Reichskohlenrat was to direct German fuel economy, and for this purpose it made use of the professional knowledge of its committees of experts. These committees gathered the knowledge from practice and research that was important in the fields of coal mining, coal utilization, and social politics; they supported practical and scientific investigations and their publication through the personal participation of the individual committee members and through the agency of specially added members at exceptionally well-qualified scientific institutions and research departments of the industry. The results of these cooperative studies and exchanges of information were generally published by the Reichskohlenrat in its Berichte. The committees of experts had no power to command.

At times, working committees on special subjects were formed and dissolved on completion of their assignments, e.g., committees on domestic fuel, industrial heat economy, production of oil from coal, combination steam and power generation, firing techniques, production and application of pulverized coal, drying techniques, etc.

Relations were maintained by correspondence with related international coal-research organizations, especially for the purpose of cooperation in preparing international conferences such as the World Power Conferences in London, Barcelona, Tokyo, Berlin, Stockholm, Washington, and elsewhere and the International Conferences on Bituminous Coal in Pittsburgh.

Besides the problems covered by the publications in the Berichte der Reichskohlenrat, approximately 30 other subjects were also considered.

It is not entirely clear to what extent the responsibilities and activities of the Reichsvereinigung Kohle can be differentiated from those of the Reichsstelle für Kohle, which it is understood jointly superseded the Reichskohlenrat in 1939. The Reichsstelle für Kohle is understood to have been entirely a governmental body with responsibility for allocation of coal. When such allocation was determined, the amount allocated was distributed by

^{4/} Prepared from Combined Intelligence Objectives Subcommittee report "Fuel Technology and the Reichsvereinigung Kohle," H. H. Lowry and H. J. Rose, 1945. (C.I.O.S. No. XXXI-28, Item No. 28; Solid Fuels No. 23.)

action of the Reichsvereinigung Kohle among its constituent syndicates. The latter body was a voluntary union of the syndicates throughout Germany, including brown coal, bituminous coal, and anthracite. Both organizations were "supreme," neither giving nor taking orders from the other - the operation was through a "personal union," as one man headed both organizations (at present, Dr. R. Regul). Present indications are that the active agency is the Reichsvereinigung Kohle.

One of the main divisions of the Reichsvereinigung Kohle is Technology and Economics (Technik und Wirtschaft). The present head is Dr. H. Schwarzkopf, formerly Secretary of the Reichskohlenrat. The members of this division are generally men active in coal economy from the coal mining industry of the various districts and coal syndicates, who have at their command facilities for research and investigation. The duties of the division originate either from working committees or the president of the Reichsvereinigung Kohle. The necessary investigations are carried out in associated laboratories, research organizations or research departments and, where advisable, with participation of the industry. The research and development work is generally financed by those doing the work, and the results, if expedient, are published in the technical press. If the results of the research and development lead to larger-scale work, the introduction of which would be useful in practice, the members of the Reichsvereinigung Kohle can be so directed by the President. The work of the committee members is honorary. For cooperation on special problems, especially prominent technical persons and appropriate organizations were called on.

Interrogation of Dr. Schwarzkopf

Dr. Reerink of the Bergbau-Verein was stated to be the best source of information on coal carbonization.

On combustion, Dr. Schulte, formerly director of the Verein für Überwachung der Kraftwirtschaft zur Ruhrzechen, and now of the Technischer Überwachungs-Verein, Essen, was cited as the best-informed authority.

Dr. Scheer, of the Bergbau-Verein, was referred to as the best-informed authority on developments in synthesis gasification.

For information on developments in low-temperature carbonization of bituminous coal, Dr. F. Müller of F. Krupp was recommended. It was stated that the biggest developments in this field were in Brux, Upper Silesia, and that Dr. Damm would be the person to see.

New developments in briquetting could be learned best from Dr. Meyer of the Bergbau-Verein. Pressures of many thousands of atmospheres had been used on a research scale for briquetting bituminous coals without a binder; the excessive wear on the machinery made the process impractical and not commercially attractive. The unreacted part from the liquid-phase hydrogenation of pitch had been used as binder for briquets. It was stated that improved 60-gram and larger briquets could be made from brown coal without binder in any briquetting press, such as the Krupp roll press, by fine grinding and

drying to zero moisture; the briquets are stable to weather and abrasion and suitable for gas generation. This method of briquetting is in use at the Rodder Grube near Liblar, near Cologne.

The constitution of coal was no longer studied by organizations such as the Kaiser Wilhelm Institut der Kohlenforschung, but only by companies such as the I. G. Farbenindustrie.

On personalities, he reported that Dr. Agde was dead and Dr. Bunte of Karlsruhe was very ill. (Actually he died sometime between November 1944 and January 1945, according to other reports.) Dr. Harold Kemmer, formerly of the Berlin Gaswerke, is now director of the Posen Gaswerke.

FUEL RESEARCH AND TECHNOLOGY AT RHEINISCH-WESTFÄLISCHES KOHLEN SYNDIKAT, ESSEN^{5/}

Conclusions

The Rheinisch-Westfälisches Kohlen-Syndikat is a sales agency for Ruhr, Aachen, and Saar coals and employs engineers for service to its customers and chemists for service to the mines. It is well-equipped for these services. The organization structure, activities, and staff are given in the C.I.O.S. report.^{2/}

During the war, R.W.K.S. was given the responsibility of approving solid-fuel-burning equipment for house heating and small commercial uses. This responsibility required cooperation with equipment manufacturers to assist in recommending changes in design to meet acceptable standards of efficiency and in selection of fuel.

Support of coal-research and technical services. - There are about 40 member companies supporting R.W.K.S. in the Ruhr and not over 60 in all. Their sales were reported to be as follows for the fiscal years beginning April 1 and ending March 31:

	Tons
1939-40	144,000,000
1942-43	153,000,000
1943-44	145,000,000
1944-45	100,000,000 (est.)

The Syndikat receives 7 to 9 pf. per ton sold (exclusive of coal used at the mines), depending on the actual cost of R.W.K.S. activities from time to time. Of the total income received before the war, stated to be about 1,200,000 M per month, about 10 percent was spent on laboratory work. The percentage of "present" income of 750,000 M per month spent on the laboratory

^{5/} Prepared from Combined Intelligence Objectives Subcommittee report "Fuel Research and Technology at Rheinisch-Westfälisches Kohlen-Syndikat, Essen," H. H. Lowry and H. J. Rose, 1945. (C.I.O.S. No. XXXI-24, Item No. 30; Solid Fuels No. 16).