

I—Appendices

APPENDIX I

COMPOSITION OF FIELD TEAMS

These were organised under the leadership of Major K. Gordon and Mr. J. A. Oriel.

The members attached to the Army Groups (Consolidated Advance Field Teams) were:—

R. E. HALES ..	Shell Refining & Marketing Company, Ltd.
E. W. HARDIMAN ..	Anglo-American Oil Company, Ltd.
C. R. MIDDLETON ..	Shell Refining & Marketing Company, Ltd.
J. W. VINCENT ..	Shell Refining & Marketing Company, Ltd.
H. G. SIMPSON ..	Imperial Chemical Industries, Ltd.
R. A. ACTON TAYLOR	Fuel Research Station, DSIR

The investigating teams were:—

1. CARBONISATION AND GASIFICATION OF COAL

H. BARDGETT ..	Fuel Research Station, DSIR
H. H. BATES ..	South-Western Tar Distilleries
H. HOLLINGS (Leader)	Gas Light & Coke Company
G. U. HOPTON ..	Gas Light & Coke Company
T. F. HURLEY ..	Fuel Research Station, DSIR
J. G. KING ..	Gas Research Board
R. NEUMANN ..	Stanton Iron Works Company, Ltd.
W. SPIVEY ..	Gas Light & Coke Company
R. A. ACTON TAYLOR	Fuel Research Station, DSIR

2. FISCHER-TROPSCH PROCESS

C. C. HALL ..	Fuel Research Station, DSIR
A. PARKER (Leader) ..	Fuel Research Station, DSIR
R. N. QUIRK ..	Ministry of Fuel and Power
A. H. TAYLOR ..	Fuel Research Station, DSIR
A. J. V. UNDERWOOD	Consultant

3. HYDROGENATION PROCESS

M. A. L. BANKS ..	Anglo-Iranian Oil Company, Ltd.
C. M. CAWLEY ..	Fuel Research Station, DSIR
C. COCKRAM ..	Imperial Chemical Industries, Ltd.
J. F. ELLIS ..	Imperial Chemical Industries, Ltd.
R. HOLROYD (Leader)	Imperial Chemical Industries, Ltd.
R. J. MORLEY ..	Imperial Chemical Industries, Ltd.
J. H. G. PLANT ..	Gas Light & Coke Company
H. G. SIMPSON ..	Imperial Chemical Industries, Ltd.
F. A. WILLIAMS ..	Fuel Research Station, DSIR

4. PETROLEUM REFINING

C. GOURLAY ..	Anglo-Iranian Oil Company, Ltd.
R. E. HALES ..	Shell Refining & Marketing Company, Ltd.
P. de H. HALL ..	Anglo-Iranian Oil Company, Ltd.
C. A. HARRISON ..	Anglo-Iranian Oil Company, Ltd.
D. MORTEN ..	Shell Refining & Marketing Company, Ltd.
C. E. SPEARING (Leader)	Anglo-Iranian Oil Company, Ltd.
C. J. WRIGHT ..	Anglo-Iranian Oil Company, Ltd.
E. H. BOOMER } (Canadian)	Canadian Department of Munitions and Supply
R. H. SMITH }	

5. LUBRICATING OIL PRODUCTION

L. KING (Leader) ..	Anglo-Iranian Oil Company, Ltd.
C. R. MIDDLETON ..	Shell Refining & Marketing Company, Ltd.
H. TER MEULEN ..	Shell Refining & Marketing Company, Ltd.
J. W. VINCENT ..	Shell Refining & Marketing Company, Ltd.

6. CRUDE OIL PRODUCTION

R. K. DICKIE ..	Anglo-Iranian Oil Company, Ltd.
A. E. GUNTHER ..	NV de Bataafsche Petroleum Maatschappij
C. A. P. SOUTHWELL (Leader)	Anglo-Iranian Oil Company, Ltd.

7. UTILISATION AND PERFORMANCE

C. H. BARTON ..	Shell Refining & Marketing Company, Ltd.
E. L. BASS ..	Shell Petroleum Company, Ltd.
E. W. HARDIMAN ..	Anglo-American Oil Company, Ltd.
D. A. HOWES ..	Anglo-Iranian Oil Company, Ltd.
Lt.-Col. H. F. JONES ..	War Office ST2
H. C. TETT (Leader) ..	Esso Development Company, Ltd.
W. H. THOMAS ..	Anglo-Iranian Oil Company, Ltd.
L. ROSENFELD ..	Institution of Automobile Engineers
H. L. WEST ..	Esso Development Company, Ltd.
J. G. WITHERS ..	Anglo-Iranian Oil Company, Ltd.

8. INTERPRETER

Major E. TILLEY ..	BLA
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Acknowledgments

The Committee wish to acknowledge the invaluable help given by the above Field Teams with a special reference to Drs. C. C. Hall, R. Holroyd and R. J. Morley, who have borne the greater part of the work of drafting this report.

We also wish to record our appreciation of the help given by the following persons, who were not members of the above Field Teams:—

Examination and Abstraction from German Documents

G. A. J. CARTER	..	Shell Petroleum Company, Ltd.
R. A. ELDRIDGE	..	Shell Petroleum Company, Ltd.
S. R. HILLS	..	Shell Petroleum Company, Ltd.
D. L. SAMUEL	..	Shell Petroleum Company, Ltd.
J. A. E. MOY	..	Anglo-Iranian Oil Company, Ltd.
K. G. G. KIRKPATRICK	..	Anglo-Iranian Oil Company, Ltd.
C. G. WILLIAMS	..	Shell Refining & Marketing Company, Ltd.

F. L. GARTON	..	Shell Refining & Marketing Company, Ltd.
R. HARGREAVES	..	Shell Refining & Marketing Company, Ltd.
J. HEYMAN	..	Shell Refining & Marketing Company, Ltd.
N. KENDAL	..	Shell Refining & Marketing Company, Ltd.
C. H. JOHNSON	..	Shell Refining & Marketing Company, Ltd.
E. LOWENTHAL	..	Shell Refining & Marketing Company Ltd.
F. J. WALLACH	..	Birmingham University
T. K. HANSON	..	Trinidad Leaseholds, Ltd.
R. GODFREE	..	Esso European Laboratories
J. F. TREMAINE	..	Esso European Laboratories
H. CLOUGH	..	Imperial Chemical Industries, Ltd.
S. R. CRAXFORD	..	Fuel Research Station, DSIR
G. H. DAZELEY	..	Fuel Research Station, DSIR
D. GALL	..	Fuel Research Station, DSIR

Final Editing

B. C. NEWBURY	..	Imperial Chemical Industries, Ltd.
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APPENDIX II

PUBLISHED FIELD TEAMS REPORTS CONCERNED
WITH LIQUID FUELS AND LUBRICANTS

Report No.	Title of Report	Reported by	Relevant sections of present Report.
CIO			
VI-22 } X-18 } XV- 5 }	Fischer-Tropsch Process	{ H. A. Schade, USN† E. Foran, USA R. C. Aldrich, USNR	{ F.T.
XV- 2	The French Shale Oil Industry	E. V. Foran, USA R. C. Aldrich, USNR	C. & G., P.R.
XVII-11	Polhoche Measurement of Lubricating Oils	R. C. Aldrich, USNR	L.O.
XVIII- 5	Synthetic Lubricating Oil Production in France	R. C. Aldrich, USNR	L.O.
XXII-15	IG Farbenindustrie Plant, Frose	W. S. Calcott, HQ ETUSA	T. & E.
XXIII-15	IG Farbenindustrie AG, Frankfurt/Main	K. Gordon, Ministry of Fuel & Power	F.T., L.O.
„ -16	Oil Targets in Ruhr and Hanover Areas	J. A. Oriel, Ministry of Fuel & Power	H., F.T., C.O., P.R., L.O.
XXIV- 9	Synthetic Lubricating Oil Plant, Rheinpreussen, Homburg	H. V. Atwell, TIIC W. C. Schroeder, TIIC	L.O.
XXV- 1	Kaiser Wilhelm Institut für Kohlenforschung, Mulheim	V. Haensel, TIIC	F.T.
„ - 4	Wirtschaftliche Forschungs Gesellschaft, Aussenstelle Munchen I	L. L. Newman, TIIC H. M. Weir, TIIC	P.R., L.O.
„ - 7	Klocknerwerke AG, Castrop-Rauxel	C. C. Hall, Ministry of Fuel & Power A. R. Powell, TIIC	C. & G., F.T.
„ -24	Die Staatliche Materialprüfungsanstalt an der Technischen Hochschule, Stuttgart	H. M. Weir, TIIC L. L. Newman, TIIC	T. & E.
„ -25	Krupp Treibstoff Werk GmbH, Wanne-Eickel	C. C. Hall, Ministry of Fuel & Power A. R. Powell, TIIC	C. & G., F.T.
„ -27	Wartime Research on Synthetic Fuels, Kaiser Wilhelm Institut für Kohlenforschung	D. R. Dewey, USNR, NAVTECMISEU	F.T.
XXVI- 5	Wirtschaftliche Forschungs GmbH, Stassfurt and Bad Berka	D. A. Howes, Ministry of Fuel & Power J. G. Allen, TIIC	P.R.
„ -50	Production of Synthetic Fatty Acids and Edible Fats, Deutsche Fettsäurewerke, Witten	E. L. Baldeschwieler, TIIC	F.T.
„ -51	Plant of Chemische Werke Hüls, Hüls	V. Haensel, TIIC E. Cotton, TIIC	P.R.
„ -78	French Oil Shale Industry	W. W. Odell, TIIC E. L. Baldeschwieler, TIIC	C. & G., P.R.
„ -79 (Same as XXV-26)	IG Farbenindustrie, Mainkur-Hoechst	C. C. Chaffee, US Ord	C.O., T. & E.
„ -80 (Same as XXV-6)	Steinkohlen-Bergwerk Rheinpreussen, Moers-Meerbeck	H. V. Atwell, TIIC W. C. Schroeder, TIIC	C. & G., F.T.
„ -87	Dachs I, Lubricating Oil Plant, Porta	J. A. Oriel, Ministry of Fuel & Power W. A. Horne, TIIC	P.R., L.O.

* C. & G. = Carbonisation and Gasification Section.

H. = Hydrogenation Section.

F.T. = Fischer-Tropsch Section.

C.O. = Crude Oil Production Section.

P.R. = Petroleum Refining Section.

L.O. = Lubricating Oil Section.

T. & E. = Testing and Evaluation Section.

† The code of abbreviations used against author's names in this bibliography is as follows:—

CM Hq = Canadian Military Headquarters.

RCAF = Royal Canadian Air Force.

Cdn = Canadian.

USFET = US Forces European Theatre.

USA = US Army.

USN = US Navy.

USNR = US Navy Reserve.

US Ord = US Ordnance.

ETUSA = European Theatre Operations US Army.

CWS = Chemical Warfare Section.

NAV TECH MIS EU = Naval Technical Mission Europe.

TIIC = Technical and Industrial Intelligence Committee.

JIOA = Joint Intelligence Objectives Agency.

Report No.	Title of Report	Reported by	Relevant sections of present Report*
CIO XXVII-14	IG Farbenindustrie, Mainkur-Hoechst	H. V. Atwell, TIIC K. Gordon, Ministry of Fuel & Power	T. & E.
" -18	The Oxo Plant, Ruhrchemie, Oberhausen-Holten	R. L. Hasche, TIIC R. H. Boundy, TIIC	F.T., P.R.
" -21	Research Activity at Deutsche Versuchsanstalt für Luftfahrt, Garmisch	S. T. Robinson, USNR R. S. Spoule, RCAF	T. & E.
" -54	Chemische Werke Essener Steinkohle, AG	C. C. Hall, Ministry of Fuel & Power	C. & G., F.T.
" -55	Gesellschaft für Linde's Eismaschinen AG, Hollriegelskreuth	H. M. Weir, TIIC	C. & G.
" -60	The Wesseling Synthetic Fuel Plant	L. H. Mulit, USNR	C. & G., H., P.R.
" -68	Fischer-Tropsch Unit at Leipzig Gas Works	W. A. Horne, TIIC	C. & G., F.T.
" -69	The Fischer-Tropsch Plant of Ruhrchemie AG, Sterkrade-Holten	V. Haensel, TIIC C. C. Hall, Ministry of Fuel & Power	C. & G., F.T., L.O.
" -70	Gutehoffnungshütte AG, Sterkrade	C. C. Hall, Ministry of Fuel & Power	F.T.
" -82	Fischer-Tropsch and Allied Processes	W. Hirschkind, CWS, ETUSA F. R. Lowdermilk, CWS, ETUSA	C. & G., F.T.
" -84	IG Farbenindustrie AG, Ludwigshafen and Oppau, Wehrmacht Items	J. Kern, R. Murray, ETUSA R. W. Sudoff, ETUSA	H., P.R., T. & E.
" -85	Miscellaneous Chemicals, IG Farbenindustrie AG, Ludwigshafen and Oppau	R. W. Sudoff, ETUSA	F.T., P.R.
" -93 (Same as XXVI-68)	Wirtschaftliche Forschungs GmbH, Fuel Blending Sta., Heiligenstadt	C. Chaffee, US, H. Schindler, TIIC D. A. Howes, Ministry of Fuel & Power	P.R., L.O., T. & E.
XXVIII-23	A. G. Sächsische Werke, Espenhain	G. S. Bays, Jr., TIIC	C. & G., F.T.
" -27	Leuna Works, near Merseberg	J. W. Livingston, TIIC	H., P.R., L.O.
" -35	Production of Fatty Acids—Fischer Tropsch Process	P. L. Pavcek	F.T.
" -36	H. Koppers GmbH, Essen	E. B. Peck, TIIC	C. & G., F.T.
" -40	The High Pressure Hydrogenation Plant, especially for Brown Coals, Wesseling	J. A. Oriel, Ministry of Fuel & Power I. H. Jones, TIIC	C. & G., H.
" -57	Deutsche Erdöl AG, Erdölwerke "Nova," Dachs II Plant, Ebensee, Austria	L. L. Newman, TIIC H. M. Weir, TIIC	P.R., L.O.
XXIX-40	Lubricants Manufactured and used by Zeiss in Jena	T. J. Rennekamp, US Ord	L.O.
" -51	Thyssen'sche Gas und Wasserwerke, GmbH, Duisburg-Hamborn Krupp Treibstoffwerk, Wanne-Eickel	L. L. Newman, TIIC	C. & G.
" -54	Ignition by means of an Injection of "Ignition Oil"	J. R. Parry, Ministry of Supply C. A. Lindblom, US Ord	T. & E.
XXX-5	Synthetic Lubricating Oils	F. R. Roberts, NAVTECMISEU	L.O.
" -10	IG Farbenindustrie, Hoechst	R. J. Ozol, US Ord C. C. Chaffee, US Ord	F.T., T. & E.
" -13	AG Sächsische Werke, Böhlen	H. Hollings, Ministry of Fuel & Power L. L. Newman, TIIC	C. & G., F.T.
" -18	Oil Recovery from Württemberg Shale	R. H. Smith, CM Hq H. Bardgett, Ministry of Fuel & Power	C. & G., P.R.
" -34	Technical Assistance on Synthetic Oils rendered the Japanese by the IG Farbenindustrie AG	E. B. Peck, TIIC I. H. Jones, TIIC	C. & G., F.T.
" -70	The Preparation of Tetrahydrofuran Polymers as a Synthetic Lubricant for Metals	F. H. Roberts, NAVTECMISEU	L.O.
" -102	Scholven Hydrogenation Plant	C. Cockram, Ministry of Fuel & Power	C. & G., H., P.R.

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P.R. = Petroleum Refining Section.
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T. & E. = Testing and Evaluation Section.

Report No.	Title of Report	Reported by	Relevant sections of present Report*
CIO XXX-103	IG Farbenindustrie AG Works, Ludwigshafen and Oppau	R. Holroyd, Ministry of Fuel & Power	C. & G., H., F.T., L.O.
„ -104	Bottrop-Welheim Hydrogenation Plant	C. Cockram, Ministry of Fuel & Power	C. & G., H.
„ -105	Gelsenberg Hydrogenation Plant	C. Cockram, Ministry of Fuel & Power	C. & G., H.
XXXI-23	Metallgesellschaft-Lurgi, Frankfurt-am-Main	C. C. Chaffee, US Ord O. G. Thompson, Ministry of Fuel & Power H. V. Atwell, TIIC	C. & G., H., F.T., P.R.
„ -25	Fuel Research and Technology, Bergbau-Verein, Essen-Heisingen	J. W. Buch, TIIC E. T. Wilkins, Ministry of Fuel & Power	C. & G.
„ -27	Coal Extraction Plant, Ruhröl GmbH	H. H. Lowry, TIIC H. J. Rose, TIIC	C. & G., H.
„ -29	Fuel Research Activities, The AG der Kohlenwertstoff-Verbände, Bochum	H. H. Lowry, TIIC H. J. Rose, TIIC	C. & G., F.T.
„ -30	Krupp-Lurgi Low-temperature Carbonisation Plant, Wanne-Eickel	H. H. Lowry, TIIC H. J. Rose, TIIC	C. & G.
„ -31	Coal and Coke Research, H. Koppers GmbH, Essen	H. H. Lowry, TIIC H. J. Rose, TIIC	C. & G.
„ -51	Luftfahrtforschungsanstalt, Volkenrode	G. H. Hinds, C. R. Illingworth, Ministry of Supply	T. & E.
„ -58	Compilation of German Fuels and Lubricants Specifications	C. C. Chaffee, US Ord	H., F.T., P.R., L.O., T. & E.
„ -75	Hüls Chemical Works, IG Farben., Hüls	J. W. Livingston, TIIC	P.R.
„ -78	Internal Combustion Engines	R. J. Bender, USNR	T. & E.
„ -79	Manufacture of Synthetic Butter	M. E. Spaght, NAVTECMISEU	F.T.
„ -85	Edeleanu GmbH, Altenburg	J. P. Jones, TIIC	C. & G., P.R., L.O.
XXXII- 3	Deutsche Erdöl AG, Mineralölwerke, Rositz	W. A. Horne, TIIC	C. & G., P.R.
„ -14	Deutsche Erdöl AG, Regis	H. Bardgett, Ministry of Fuel & Power	C. & G.
„ -15	Kukuck I Plant, Niedersachswerfen	J. F. Ellis, Ministry of Fuel & Power	H.
„ -16	Stuttgart Technische Hochschule, Forschungs Institut für Kraftfahrwesen und Fahrzeug Motoren	H. C. Tett, Ministry of Fuel & Power	L.O., T. & E.
„ -17	Underground Factories in Central Germany	Ministry of Supply Team, led by W. R. J. Cook	H., P.R., L.O.
„ -68	The Manufacture and Application of Lubricants in Germany	M. E. Spaght, NAVTECMISEU	L.O.
„ -89	Luftfahrtforschungsanstalt, Braunschweig	H. C. Tett, Ministry of Fuel & Power	T. & E.
„ -90	Wintershall AG, Lützkendorf	H. Hollings, Ministry of Fuel & Power	C. & G., H., F.T., P.R., L.O.
„ -91	Lurgi Gesellschaft für Wärmetechnik, Frankfurt-am-Main	H. Hollings, Ministry of Fuel & Power J. G. King, Ministry of Fuel & Power	C. & G., F.T.
„ -92	Brabag I Plant, Böhlen	J. F. Ellis, Ministry of Fuel & Power	C. & G., H., P.R.
„ -93	Gesellschaft für Teerverwertung GmbH, Duisburg-Meiderich	H. H. Bates, Ministry of Fuel & Power	C. & G.
„ -94	German Petroleum Industry, Hamburg District	P. de H. Hall, Ministry of Fuel & Power	H., P.R., L.O., T. & E.
„ -96	Ruhrchemie AG, Sterkrade-Holten	W. F. Faragher, TIIC D. A. Howes, Ministry of Fuel & Power	F.T., P.R., L.O., T. & E.

* C. & G. = Carbonisation and Gasification Section.
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APPENDICES

Report No.	Title of Report	Reported by	Relevant sections of present Report*
CIOS XXXII-107	IG Farbenindustrie AG, Leuna	R. Holroyd, Ministry of Fuel & Power	C. & G., H., F.T., C.O., P.R., L.O.
XXXIII-5	Methanisation of Coal Gas. Information obtained from Dr. Martin of Ruhrchemie AG, and from Dr. Traenckner of Ruhrgas AG	E. T. Wilkins, Ministry of Fuel & Power	C. & G., F.T.
" -15	Verein für die bergbaulichen Interessen (Bergbau-Verein), Heisingen, Ruhr	H. Bardgett, Ministry of Fuel & Power	C. & G.
" -16	F. Krupp AG, Altendorfer Strasse, Essen	H. Bardgett, Ministry of Fuel & Power	C. & G.
" -18	Gelsenkirchner Bergwerks AG (GBAG) Rosastrasse, Essen and Nordstern, Wanne-Eickel	H. Bardgett, Ministry of Fuel & Power	C. & G.
" -24	Report on Investigations by Fuel and Lubricants Team at the Brabag Works at Tröglitz-Zeitz	J. F. Ellis, Ministry of Fuel & Power R. J. Morley, Ministry of Fuel & Power	C. & G., H., L.O.
" -29	Sulphur Recovery from Spent Purifier Oxide, Ruhrgas AG, Herwarth Strasse, Essen	H. Bardgett, Ministry of Fuel & Power	C. & G.
" -30	Stickstoffwerk Hibernia, Wanne-Eickel, Ruhr	H. Bardgett, Ministry of Fuel & Power	C. & G.
" -37	Cokeoven Installation of Reichwerke AG, Hermann Goering Werke at Watenstedt, near Brunswick	H. Bardgett, Ministry of Fuel & Power	C. & G.
" -40	Nordstern Cokeoven Plant, Gelsenkirchner Bergwerks AG	R. Neumann, Ministry of Fuel & Power H. H. Bates, Ministry of Fuel & Power	C. & G.
BIOS 13	German Montan Wax Industry	G. Palmer, Ministry of Aircraft Production G. E. Shillitoe, Ministry of Aircraft Production A. MacMaster, Ministry of Aircraft Production	F.T., P.R.
39	Concealed Oil Plants in the Brilon-Bredelar Area	R. A. Acton Taylor, Ministry of Fuel & Power F. A. Williams, Ministry of Fuel & Power	P.R.
42	WIFO Oil Storage Depots at Eickeloh, Ruthen and Nienburg	C. A. Harrison, Ministry of Fuel & Power E. Laidlaw, Ministry of Fuel & Power	P.R., L.O.
82	Inspection of Hydrogenation and Fischer-Tropsch Plants in Western Germany, during September, 1945	T. E. Warren, Canadian Investigator	H., F.T.
118	Munich Technical High School—Interrogation of Dr. E. H. Kadmer and Dr. K. Schnauffer	W. H. Thomas, Ministry of Fuel & Power C. C. Chaffee, US Ord	L.O., T. & E.
119	Deutsche Versuchsanstalt für Luftfahrt (DVL) Institut für Betriebsstoff Forschung	C. C. Chaffee, US Ord W. H. Thomas, Ministry of Fuel & Power	T. & E.
120	Wirtschaftliche Forschungs Gesellschaft mbH, Hitzacker Depot	H. F. Jones, War Office, ST2 H. L. West, Ministry of Fuel & Power	P.R., L.O., T. & E.
121	WIFO Heiligenstadt Installation	H. F. Jones, War Office ST2 A. O. Bell, 21st Army H. L. West, Ministry of Fuel & Power	P.R.
122	WIFO Herr Helmut Plote	H. L. West, Ministry of Fuel & Power	P.R.
131	The Production of Alcohols and Ketones from Olefins at the Treibstoffwerke Rheinpreussen, Moers, near Duisburg	M. A. Matthews, Ministry of Supply W. L. Wood, Ministry of Supply	F.T.

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Report No.	Title of Report	Reported by	Relevant Sections of present Report*
BIOS 197	Reichinstitut für Erdölforschung, Technischen Hochschule, Hannover	A. E. Gunther, Ministry of Fuel & Power	C.O., P.R.
199	Ten Years of Oxygen Gasification at Leuna	C/E Sabel	C. & G.
200	Organisation of Deutsche Versuchsanstalt für Luftfahrt (DVL)	D. A. Howes, Ministry of Fuel & Power	T. & E.
324	Band Oil Filter, Oil Refinery at Porta, near Minden	T. Brookbank, Ministry of Fuel & Power J. A. Green, Ministry of Fuel & Power W. D. Wemyss, Ministry of Fuel & Power	P.R., L.O.
325	Kaiser Wilhelm Institut für Strömungsforschung, Abteilung Reibungsforschung, Berlin. Interrogation of Dr. Ing. G. Vogelpohl	D. A. Howes, Ministry of Fuel & Power	L.O.
326	Interrogation of A. Bollhorn, E. Grages and Dr. Gross of Deutsche Erdöl AG, Berlin	D. A. Howes, Ministry of Fuel & Power	C. & G., P.R., L.O.
330	Wirtschaftliche Forschungsgesellschaft mbH, Eickeloh Installation	H. F. Jones, War Office ST2 H. L. West, Ministry of Fuel & Power	P.R., L.O., T. & E.
331	Amalia Benzole Refinery	C. A. Murray, Jr., Ministry of Fuel & Power	C. & G.
332	Chemische Fabrik Weyl AG	C. A. Murray, Jr., Ministry of Fuel & Power	C. & G.
333	Winkler Generators and Manufacture of Water Gas, etc.	R. J. Morley, Ministry of Fuel & Power	C. & G., H., F.T.
334	Development of Geophysical Prospecting in Germany during the War	A. O. Rankine, Ministry of Fuel & Power A. Van Weelden, Ministry of Fuel & Power R. Davies, Ministry of Fuel & Power	C.O.
335	Metallgesellschaft AG, and the Lurgi Groups of Chemical Engineering Companies	W. R. Beswick, Ministry of Supply N. C. Fraser, Ministry of Supply	C. & G., F.T., L.O.
373	IG Farbenindustrie AG, Ludwigshafen, Fuels and Lubricants	D. A. Howes, Ministry of Fuel & Power W. H. Thomas, Ministry of Fuel & Power	H., P.R., L.O., T. & E.
419	IG Waxes, Manufacture at Gersthofen and Oppau	W. Baird, Ministry of Supply G. R. Perdue, Ministry of Supply	F.T., P.R.
447	Interrogation of Dr. Otto Roelen of Ruhrchemie AG	C. C. Hall, Ministry of Fuel & Power S. R. Craxford, Ministry of Fuel & Power D. Gall, Ministry of Fuel & Power	F.T.
450	Gesellschaft für Teerverwertung mbH, Duisburg-Meiderich and Castrop-Rauxel	C. J. Waller, C. A. Murray, Jr., Ministry of Fuel & Power	C. & G.
510	Samples of Petroleum Products collected from the Hamburg, Hannover, Bremen and Kiel Areas	J. G. Withers, Ministry of Fuel & Power W. H. Thomas, Ministry of Fuel & Power E. B. Robinson, BAOR	F.T., P.R., L.O., T. & E.
511	Ruhrchemie AG, Sterkrade, Holten—Interrogation of Dr. O. Roelen	J. G. Withers, Ministry of Fuel & Power H. L. West, Ministry of Fuel & Power	C. & G., F.T., L.O.
512	Schlafhorst Chemische Werke GmbH, Hamburg—Lubricants	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	L.O., T. & E.

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T. & E. = Testing and Evaluation Section.

Report No.	Title of Report	Reported by	Relevant sections of present Report*
BIOS 513	Notes on the Organisation of the German Petroleum Industry during the War	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	P.R., L.O.
521	Lurgi High Pressure Gasification	H. Hollings, Ministry of Fuel & Power G. U. Hopton, Ministry of Fuel & Power E. Spivey, Ministry of Fuel & Power	C. & G.
524	Deutsche Gasolin AG, Hamburg—Lubricants	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	F.T., P.R., L.O. T. & E.
525	Staatliches Material Prüfungsamt, Berlin-Dahlem	D. A. Howes, Ministry of Fuel & Power	P.R., L.O., T. & E.
586	Ernst Schliemann's Oelwerke und Export-Ceresin Fabrik, Hamburg—Lubricants and Miscellaneous Products	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	L.O., T. & E.
590	Deutsche Vacuum Oel AG, Workshop at Grosse Ilsede and Oilfield Laboratory near the Oberg Oilfield	R. K. Dickie, Ministry of Fuel & Power	C.O.
591	Large-scale Production of Oxygen and Atmospheric Gases	A. M. Clark, Ministry of Fuel & Power	C. & G.
596	Gesellschaft für Teerverwertung, Varziner Strasse, Duisburg-Meiderich, Ruhr	H. Bardgett, Ministry of Fuel & Power	C. & G.
597	Interrogation of Dr. C. H. N. Bensmann	W. H. Thomas, Ministry of Fuel & Power W. F. Faragher, US Petroleum Administration for War	P.R.
598	Oelwerke Julius Schindler GmbH, Hamburg	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	L.O., T. & E.
635	Mineralölwerke Albrecht —Lubricants	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	L.O., T. & E.
636	Mineralölwerke, F. Harmsen, Kiel—Lubricants	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	L.O., T. & E.
637	Olex Deutsche Benzin and Petroleum Gesellschaft—Fuels and Distribution	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	T. & E.
638	Deutsche Erdöl AG, Hamburg—Crude Oil and Products	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	C.O., P.R., L.O.
639	Deurag-Nerag Gewerkschaft Deutsche Erdöl Raffinerie and Neue Erdöl Raffinerie—Fuels and Lubricants	W. H. Thomas, Ministry of Fuel & Power J. G. Withers, Ministry of Fuel & Power	P.R., L.O.
JIOA 37	German Bulk Storage of Liquid Fuels	Office, Chief Engineer, USFET	P.R.
40	German Oil Refineries	Office, Chief Engineer, USFET	H., P.R., L.O.

* C. & G. = Carbonisation and Gasification Section.
H. = Hydrogenation Section.
F.T. = Fischer-Tropsch Section.
C.O. = Crude Oil Production Section.

P.R. = Petroleum Refining Section.
L.O. = Lubricating Oil Section.
T. & E. = Testing and Evaluation Section.

Report No.	Title of Report	Reported by	Relevant sections of present Report*
FIAT 90	Interrogation of Professor Franz Fischer	W. A. Horne, TIIC	F.T.
239	Fischer-Tropsch Plant of Hoesch Benzin AG, Dortmund	W. Schroeder, TIIC R. Neumann, Ministry of Fuel & Power	F.T.
276	Interrogation of Dr. Helmuth Pichler and Prof. Karl Ziegler at Kaiser Wilhelm Institut für Kohlenforschung, Mulheim	W. F. Faragher, TIIC W. A. Horne, TIIC	F.T.
293	IG Farbenindustrie, Leverkusen—Oils, Recoil and Lubricant	W. F. Faragher, TIIC C. C. Chaffee, TIIC H. Schindler, TIIC	P.R., L.O., T. & E.
299	Supplemental Report on the Ruhröl Hydrogenation Plant, Welheim, Ruhr	W. F. Faragher, TIIC W. A. Horne, TIIC	H.
362	Synthetic Fatty Acids, IG Farbenindustrie AG, Ludwigshafen	K. S. Markey, JIOA	H., F.T., P.R.
368	Interrogation of Dr. Gunter Spengler, Munich, formerly of Institute for Coal Research, German Technical High School, Prague	W. H. Thomas, Ministry of Fuel & Power J. G. Allen, TIIC	C. & G., P.R., T. & E.
401	Wifo, Berlin—Evacuated Personnel at Munich	R. J. Ozol, US Ord C. C. Chaffee, US Ord	P.R., L.O.
422	Manufacture and Regeneration of Catalysts at IG Farbenindustrie AG, Ludwigshafen/Oppau	W. F. Faragher, JIOA W. A. Horne, JIOA	C. & G., H.
423	Synthetic Lubricating Oil Manufacture, Rhenania-Ossag, Mineralölwerke AG, Harburg Refinery	J. G. Allen, JIOA	F.T., P.R., L.O.
424	Butadiene from Hydroaromatics	I. H. Jones, TIIC	P.R.
425	Gasification of Brown Coal Briquettes in Pintsch-Hillebrand Water Gas Generators at Wesseling	I. H. Jones, TIIC	C. & G.
426	Interrogation of Dr. Pier and Staff, IG Farbenindustrie AG, Ludwigshafen/Oppau	W. A. Horne, JIOA W. F. Faragher, JIOA	H., F.T., P.R., T. & E.
447	Study of Production of Shale Oil from Oil Shale in Württemberg	F. H. Reed, JIOA	C. & G., P.R.
476	Deep Well Turbine Submersible Pump Motors	F. J. McEntee, JIOA	C.O.
577	Survey of the Leading Manufacturers of Pressure Vessels	R. W. Clark, JIOA	H.
698	Photographing a Single Fuel Injection	R. C. Mathewson, JIOA	T. & E.
709	Verbrennungsmotoren (Internal Combustion Engines), by Prof. Schmidt (in German)	Introduction by G. von Elbe, JIOA	T. & E.
729	The German High-temperature Coal-tar Industry	E. O. Rhodes, JIOA	C. & G.
741	Catalysts for Coal Hydrogenation	P. W. Sherwood, JIOA	H.
810	Activated Clay Bleaching Adsorbents	A. D. Rich, TIIC	P.R.

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APPENDIX III

GLOSSARY OF TERMS AND ABBREVIATIONS

- ALKAZID PROCESS.**—A process for removing hydrogen sulphide and carbon dioxide from gases. The gases are scrubbed with one of a number of selective absorbents ("M" Liquor, DIK Liquor—salts of amino-acids) which is then regenerated by raising the temperature and distilling off the dissolved gases.
- ALKYLATE.**—A mixture of branched-chain paraffins obtained by combining isobutane with n-butylene in the presence of sulphuric acid.
- AMF COAL.**—Coal calculated as combustible material only, i.e. on an ash- and moisture-free basis.
- BAYERMASSE.**—An impure form of iron oxide obtained as a by-product from aluminium manufacture and used as a hydrogenation catalyst.
- BIOS.**—British Intelligence Objectives Sub-Committee.
- BMEP.**—Brake mean effective pressure. The uniform pressure which, acting throughout the power stroke only, would give the horse-power measured at the engine shaft.
- BOTTLED GAS.**—A general term for light hydrocarbons, mainly propane and butanes, sold as liquids under pressure for fuels.
- BRIGHT STOCK.**—A general term applied to clean high viscosity lubricating oils.
- CFR.**—A standard engine used for determining the octane number of a fuel.
- CAFT.**—Consolidated advance field team. Personnel allotted to army groups for preliminary assessment of targets for investigating teams.
- CETANE NUMBER.**—A method of rating the behaviour of a fuel in a diesel engine and indicates a measure of the delay between injection and ignition of the fuel. It is quoted as the percentage of cetane in a cetane- α -methyl naphthalene mixture which gives the same ignition delay as the fuel under consideration when tested under similar conditions.
- CIOS.**—Combined (i.e. UK and US) Intelligence Objectives Sub-Committee.
- COWPER.**—A large vessel filled with refractory chequerwork for heating gases. The refractory is alternately heated by burning fuel gas and cooled by the passage of the gas to be heated.
- DHD.**—A modification of the hydroforming process (q.v.) using only one reactor system and a higher hydrogen pressure (40–50ats).
- DIK LIQUOR.**—See "ALKAZID."
- DIN.**—A German specification corresponding to the British Standards Specifications (BSS).
- FBP.**—Final boiling point. The temperature at which the last drop of a batch of oil distils in a standard distillation apparatus.
- FUGAL.**—A general term for a machine used to separate two components by means of centrifugal force and may be either:—
 (a) A machine for separating liquids of different densities, i.e. a centrifuge.
 (b) A machine for accelerated filtration having a filter-basket rotating at high speed and retaining the solids while the liquids are thrown through the basket by centrifugal force.
- GLEITOL.**—An oil introduced into lines carrying coal paste for hydrogenation. This oil is reputed to surround the paste and prevent sticking to the walls of the lines.
- GRUDE.**—Brown coal coke.
- HOLD.**—Heavy oil let-down. The heavy oil deposited in the hot catchpot immediately after the converters in the liquid phase hydrogenation of oils and coal.
- HF PROCESS.**—The original hydroforming process of IG Farbenindustrie, treating natural petroleum naphthas.
- HYDROFORMING.**—A medium pressure (15ats) dehydrogenation process carried out in the presence of hydrogen, used for converting naphtha fractions into highly aromatic petrols.
- HYDROPETROL.**—Petrols produced by the hydrogenation process.
- IBP.**—Initial boiling point. The temperature at which the first drop of oil distils in a standard distillation apparatus; an indication of the amount of light hydrocarbons in the oil.
- KNOCK RATING.**—See "OCTANE NUMBER."
- KWI.**—Kaiser Wilhelm Institut.
- KW PROCESS.**—A modification of the methane-steam process in which the necessary heat is developed directly by burning part of the hydrocarbon gas with oxygen instead of using indirect heating.
- LEADED PETROL.**—See "TEL."
- LEISTUNG.**—In the hydrogenation process, this expression means the throughput per m³ of catalyst $\times$ fraction converted, i.e. weight of material converted per hour per unit volume of catalyst, te/m³/hr. For the Fischer-Tropsch process, it is the weight of hydrocarbon product obtained per unit volume of catalyst per hour.
- LUXMASSE.**—Impure hydrated iron oxide, obtained as a by-product of aluminium manufacture.
- "M" LIQUOR.**—See "ALKAZID."
- MTH.**—A process for hydrogenation of certain heavy oils in the liquid phase using fixed catalyst beds in a plant similar to that used for vapour phase hydrogenation. The reaction temperature is about 390°C.
- MUG.**—Make-up gas.
- OCTANE NUMBER.**—The tendency of fuels to detonate, knock or "pink" sets a limit to the power which can be obtained from a given swept cylinder capacity. Octane number is a measure of a fuel's resistance to knocking, and is defined as the volume percentage of iso-octane in an iso-octane/n-heptane mixture which matches the fuel in knock intensity when tested in a standard engine under specified conditions.
 Even in the same engine, different conditions of speed, temperature, etc., lead to different ratings of the same fuel, e.g. the CFR Research Method rating of a "sensitive" fuel may be 5–10 units higher than its CFR Motor Method rating.
- ON.**—Octane number (see above).
- PVC.**—Polyvinyl chloride. A plastic obtained by polymerisation of vinyl chloride.
- TEL.**—Tetra-ethyl lead. A substance added to petrols to increase the octane number. Petrols as produced are known as "unleaded" or "clear." After the addition of TEL they are termed "leaded." Petrols are said to show a "good lead response" if the addition of TEL causes a large increase in octane number.
- TETRAMER.**—A polymer formed by the union of four molecules of monomer.
- TTH.**—A process similar to MTH (q.v.) but using a lower reaction temperature to produce some wax and lube oil.
- UNLEADED PETROL.**—See "TEL."
- VI.**—Viscosity index. A measure of the change in viscosity with temperature. High VI oils (HVI) show a smaller dependence of viscosity on temperature than do low VI oils.
- WICKEL VESSEL.**—A high pressure vessel made by winding a light-walled vessel with steel tape.
- ZUSCHLAG.**—A surcharge for factory overheads and administration—usually added as a percentage of labour cost.

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APPENDIX IV **CONVERSION TABLES**

1. Length		7. Heat Transfer	
1 millimetre (mm)	= 0.0394 in.	Conductance	
1 metre (m)	= 3.28 ft.	1 k.cal/m ³ /hr./°C.	= 23.75 BTU/ft ² /hr/°F.
2. Area		8. Calorific Value	
1 sq.metre (m ²)	= 10.76 sq.ft.	1 k.cal/m ³	= 0.1125 BTU/cu.ft.
		1 k.cal/kg	= 1.8 BTU/lb.
3. Volume		9. Energy	
1 cu.metre (m ³)	= 35.314 cu.ft.	1 k.cal	= 3.968 BTU
	= 220 Imp.gallons	1 te.cal.	= 0.03968 therms.
	= 264.17 US gallons		
	= 62.8 US bbls.		
4. Mass		10. Pressure	
1 tonne (te)	= 0.9842 long tons	1 kg/cm ³	= 0.968 atmospheres
	= 2,204.6 lb.		= 735.6 mm Hg
	= 1,000 kg		(28.96 in. Hg)
			= 14,223 lb/sq.in.
5. Density		11. Costs	
1 kg/m ³	= 0.624 lb/cu.ft.	RM1	= £ 0.1 (approx.)
1 gm/m ³	= 0.437 grains/cu.ft.	RM1/te	= 0.0109 pence/lb.
		RM1/m ³	= 0.68 pence/cu.ft.
			= 0.109 pence/Imp.gallon
6. Volume Rate			
1m ³ /hr	= 3.667 Imp.gallons/min.		
	= 0.588 cu.ft./min.		
	= 1,505 US bbls/day		
	(151 B/D)		