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CULTURAL SERVICES DEPARTMENT

Archives catalogue

U262

Records of Charles Craib Middleton, Eccles, near Manchester, chemical engineer, 1927-67, n.d.

Deposited: per Kevin C. Conroy, Esq., 36 Stafford Road, Eccles, Manchester, M30 9ED, Nov., 1982.

Catalogued: A.N. Cross, Nov., 1985-Jan., 1986.

Location: Archives Centre, 658/662 Liverpool Road, Irlam, Manchester, M30 5AD.

The following records were found at 36 Stafford Road, Eccles, Manchester, M30 9ED, by Mr. Conroy, who lived there after Mr. Middleton, in a basement where they had become covered with fungus and had otherwise suffered from damp. They were fumigated and metal which had rusted was removed. Brochures which had become heavily damaged by damp were destroyed, as also issues of transactions of professional bodies which had not been marked or had no apparent relevance to the following records. Copies of documents in excess of two copies of the same version of a document were also destroyed. U262/B53-55, 71, 80, 82, 86-87, 89-90 were found in one bdle.

Charles Craib Middleton had printed a very detailed curriculum vitae on his career to 1948 (see U262/B37) which includes the following information. He was born in Hamilton, Ayrshire, in 1901. He became a member of several professional bodies. Among the posts which he held were ones with Woodall Duckham Co., 63-77 Brompton Road, London, S.W.1 (from 1928), with I.C.I. (Explosives) Ltd., Research Department, Ardeer Works, Stevenston, Ayrshire (from 1940), and with Lansil Ltd., Lancaster (from 1945). The curriculum ends with a list of coke oven plants which he had controlled, incl. those of the following:

- Nunnery Coke and Gas Co.Ltd., Handsworth, near Sheffield;
- Nunnery Colliery Co.Ltd., Nunnery Pit, near Sheffield;
- Thorncliffe Coal Distillation Ltd., Smithywood Works, near Sheffield;
- British Benzol and Coal Distillation Ltd., Bedwas, near Newport, Monmouthshire;
- John Lysaght Ltd., Normanby Park Steelworks, Scunthorpe, Lincolnshire;
- Lancashire Steel Corporation Ltd., Irlam, Lancashire;
- South African Iron and Steel Corporation Ltd., Pretoria, South Africa;
- Stewarts and Lloyds Ltd., Corby, near Kettering;
- Workington Iron and Steel Co., Moss Bay, Workington, Cumberland;
- Barnsley District Coking Co.Ltd., Worksborough, near Barnsley;
- Brancepeth Gas and Coke (Strakers and Love) Ltd., Willington, Co. Durham;
- Waleswood Coking Co.Ltd., Waleswood Collieries, near Sheffield;
- Richard Thomas and Baldwins Ltd., Ebbw Vale, Monmouthshire, and Redbourn Works, Scunthorpe, Lincolnshire.

He was subsequently appointed to the staff of the Royal College of Advanced Technology, Salford, which became the University of Salford in 1967. There he advocated a process for using methane from coalmines as a fuel by means of a plant which he described in

## UNOFFICIAL COLLECTIONS

a paper (U262/B62-64) as consisting of a waste heat boiler between two regenerators. Doubts were expressed about the process on economic grounds. He took out patents on it (U262/B37, 41, 44-52).

He retired from lecturing and died during 1967 (information supplied by Mr. Conroy).\*

## BUSINESS

Docs. or copies produced or received by Woodall-Duckham (1920) Ltd., Ebury and Allington Houses, 136-150 Victoria Street, London, S.W.1, incl. a few (incl. copy of memorandum to him at Pretoria, South Africa, 1933) sent to or by C.C. Middleton and a provisional specification (marked as dropped owing to anticipation as in accompanying copy of a patent, 1933) of a patent (for concentration of ammoniacal liquors as during carbonisation of coal) to which he was a party, extracts from publications, graphs and diagrams, [1927]-[1937], n.d., relating to plants producing coal gas, esp. that of John Lysaght Ltd., Normanby Park Steel Works, Scunthorpe, Lincolnshire, incl. references also to other plants (Thorncliffe, Nunnery, Bedwas, Partington and Corby, Great Britain, and plant at Pretoria, South Africa) and with paper and graphs describing water cooling towers esp. with reference to Ebbw Vale, Wales, 1937-38, and with brochure on fans for ventilation of mines, n.d. (1 folder containing docs.)

[1927]-38,  
n.d.

/B2 Page of rough notes on "Lysaghts WO Cooler" (1 doc.)

n.d.

/B3 Letters to or apparently for C.C. Middleton and accompanying papers on various benzole plants, esp. the Partington plant, Lancashire (one letter addressed to C.C. Middleton, c/o the Lancashire Steel Corp.Ltd., Irlam, Manchester, 1932) and the Thorncliffe plant (of Thorncliffe Coal Distillation Ltd.) but also to benzole plants (Bedwas, Lysaghts, Nunnery, Barrow Barnsley and Workington (Moss Bay), and to coke ovens (Dowlais and Nunnery, with other references to use of steam in plants at same sites and in coke ovens at Dowlais) (1 bdle.)

[1930]-32,  
1935, n.d.

/B4 Vol. marked "Mine Air":

1931-66, n.d.

At front attached blueprints some or all showing machinery at Partington benzole plant, 1931, n.d., and written notes on Partington reflux condenser, n.d.;  
Page headed "Barlow Gillett and Perceval", listing expenses during years 1963-1966 on account of patents, 1966 or later;  
At end, written notes headed "Heat Transfer (I.C.I. Book 1941)", n.d.;  
Page with rough pencilled notes intended to accompany a graph, n.d.;  
Two pages of notes on prices of shares in rubber companies during years 1932, 1934-36, and in iron and steel companies during year 1936, n.d. (1936 or later).

(1 vol.)

\*According to a certificate held by the Manchester District Probate Registry the date of death was 27 Oct., 1967; for copies of wills relating to his estate see A/TR352.

## UNOFFICIAL COLLECTIONS

## BUSINESS

U262/B5

Folder marked "Waleswood" containing papers of Woodall-Duckham Vertical Retort and Oven Construction Co. (1920) Ltd. incl. reports, diagrams and graphs relating esp. to gas-producing plant of Waleswood Coking Co.Ltd. but with also references to such plant of Strakers and Love and of John Lysaght Ltd. and to other such plant (incl. Workington, Barrow Barnsley, Nunnery, Corby, Thorncliffe, Cardiff, Moss Bay, Ebbw Vale and Redbourn, Great Britain, and plant at Pretoria, South Africa), incl. papers addressed to C.C. Middleton or marked with his name (1 folder containing docs.)

[1936]-38,  
n.d.

See also U262/B41

/B6

Folder containing newscuttings, preprinting or proof copies or other copies of publications, reports, diagrams, notes, letters and other docs. (incl. letters to C.C. Middleton) relating to plastics, stainless-clad steel, fractionating techniques, "Cellofas" (produced by I.C.I. at Ardeer during the second World War), "Saran" (polyvinylidene chloride), filters (of Metafiltration Co.Ltd., Belgrave Works, Hounslow, Middlesex), direct-hydraulic system, vapourisation of liquids, ethylene production, "Elin Hafergut Welding Process" and regulations for pressure vessels (apparently pressure vessels in the Dyestuffs Group of I.C.I.) (1 folder containing docs. and copies of publications)

1934,  
1943-49, n.d.

Two letters to C.C. Middleton indicate that by 1947 his address was Clarendon House, Clarendon Road, Eccles.

/B7

Page headed "Report upon High Pressure Hot Water Heating System" with typed description of its possible use, apparently prepared in a firm (1 doc.)

1948

/B8

Folder marked "Heat Exchangers Performance Results" containing reprints, 1958-59, accompanying letter, 1959, copies of paper, 1961, and written or typed notes, 1943, 1953, n.d., on heat exchangers and cooling (1 folder containing docs.)

1943-61, n.d.

/B9

Folder, first page headed "Heat Transfer and Pressure Drop", containing notes (mostly typed), graphs and diagrams, n.d., incl. references to dates up to 1941, in appearance resembling contents of U262/B10 (1 folder containing docs.)

n.d.

/B10

Folder, marked "Absorption and Spray Cooling of Gases. Spray Heating of Liquids" and "Absorption Theory and Gas Properties", containing notes (mostly typed), graphs and diagrams, n.d. incl. references to dates up to 1943 (1 folder containing docs.)

n.d.

/B11

Folder marked "Heat Transfer" containing graphs (with some mathematical tables copied from a publication) (1 folder containing docs.)

n.d.

## UNOFFICIAL COLLECTIONS

## BUSINESS

- U262/B12 Volume headed "Heat Transfer" containing brief written notes on some kinds of heat exchangers, n.d., and rough notes, n.d. incl. references to dates from 1930 to 1954, apparently on details of exchangers with particular specifications (incl. reference to I.C.I. and one page headed "Comparison of TEMA. W.J.F. and CCM.") (1 vol. containing, loose, typed annotated copy of minutes of meeting incl. C.C. Middleton of W.J.F., 1954) 1954, n.d.
- /B13 One copy of paper on heat transfer, "Part II", by T.M. Coulson and M.J. McNelly (1 doc., duplicated) 1954 or later
- /B14 Photocopy, annotated, of paper on heat transfer prepared for discussion at a session of the A.S.M.E. annual meeting in Dec., 1934 (1 doc.) [1934]
- /B15 Vol. headed "Calculations Distillation C.C. Middleton" containing rough notes, plans and graphs, some dated 1953, on various plants, with memorandum, 1953, and copies of plans, [1950] (1 vol. enclosing loose docs.) [1950], 1953  
 These plants include Esso Purfleet, Esso Ellesmere Port, Johannesburg "NH3" and British Diesel Oil and Petrol Oil, Chesterfield.  
 This vol. gives address of C.C. Middleton as 48 Stainforth Road, Seven Kings, Ilford, Essex.
- /B16 Vol. headed "Lab. Equipment Calculations Salford T." containing rough written notes and plans (incl. reference to one date in 1955) chiefly concerning columns in chemical engineering and, loose, two letters, 1957, and sheet, n.d., chiefly on supply of equipment (1 vol. in same style as that above) 1957, n.d.
- /B17 Stationery wallet headed "Air in Ducts" containing rough notes, graphs and plan (1 stationery wallet containing docs.) n.d.
- /B18 Bdle. of notes, headed "Project Economics", containing written notes on forecasts of costs of production and of costs of depreciation in work of chemical engineers, other economic matters, designing plant and preparing design reports, apparently compiled for use in lecturing, 1949 or later with annotations or additions dated 1957-64, n.d., and with cuttings from or copies of publications, n.d. (1 bdle.) 1957-64, n.d.
- /B19 Written notes, on combustion of gases, apparently used for lecture notes, with annotations dated 1956 or 1957 and n.d. and with two cuttings from publications, 1957, n.d. (1 bdle.) 1956-57, n.d.
- The following items mostly relate to the scheme for using methane from coalmines.
- /B20 Folder marked "N.C.B." containing correspondence and other docs. on use of methane from coalmines (1 folder containing docs.) 1962-67
- /B21 Folder marked "Ministry of Power" containing correspondence and other docs. on same use of methane (1 folder containing docs.) 1963-66



## UNOFFICIAL COLLECTIONS

## BUSINESS

- U262/B22 Folder marked "Sir H H Sir H R-C Institute of Fuel" containing correspondence and other docs. on same use of methane (1 folder containing docs.) 1963-65
- /B23 Folder marked "N.R.D.C." containing correspondence and other docs. on same use of methane, 1965-66, and publications on the National Research Development Corporation, 1964, n.d. (1 folder containing docs. and publications) 1964-66, n.d.
- /B24 Folder marked "Mine Air correspondence" containing correspondence with various companies and other docs. on same use of methane (1 folder containing docs.) 1962-65
- /B25 Folder marked "Mine Air Parsons Inter [national] Comb[ustion Ltd.]" containing correspondence with various companies or other organisations and other docs. on same use of methane (1 folder containing docs.) 1964-66
- /B26 Folder marked "Sterile Approaches" containing correspondence with various companies on same use of methane (1 folder containing docs.) 1965-67
- /B27-30 Three folders, each marked "Confidential Upcast Air Selected Correspondence With Comments" and containing photocopies of other copies, n.d., of letters (largely from organisations as above, arranged and numbered) and other papers on same use of methane, [1962-65], with written notes, n.d., found in bdle. with page of written notes headed "Staff [ord] Myth", n.d., on same use of methane (1 sheet and 3 folders containing docs. found as a bdle. surrounded by a rubber band) [1962-65], n.d.
- /B31 Photocopy, n.d., of letter dated 14 July, 1966, from National Coal Board as in U262/B19 concerning same use of methane but not showing annotation added to original letter (1 doc.) [1966]
- /B32 Photocopy, n.d. of letter dated 6 May, 1966, from National Research Development Corporation as in U262/B22 concerning same use of methane, with additional annotations (1 doc.) [1966]
- /B33 Folder marked "Stein Atkinson Stordy" containing brochure, [1965], and papers or copies concerned in correspondence with Stein Atkinson Stordy Ltd., Westminster House, Kew Road, Richmond, Surrey, and elsewhere, engineers, concerning same use of methane, 1966-67, and photocopy, n.d., of published paper on gas turbine development, [1965] (1 folder containing docs. and publications or copies) [1965], 1966-67, n.d.

## UNOFFICIAL COLLECTIONS

## BUSINESS

- U262/B34 Letter to C.C. Middleton concerning supply of refractory cast blocks from John G. Stein and Co.Ltd., Bonnybridge, Scotland, 1966, and brochure of same firm, 1965, containing another letter to C.C. Middleton, 1966, and printed list, 1966 (1 letter, 1 brochure containing docs.) 1965-66
- /B35 Brochure on hot-face insulating refractories, printed for Allen and Son /Halifax/ Ltd., Genefax House, Tapton Park Road, Sheffield, 10, and Hipperholme Works, Halifax, Yorkshire, part of Genefax Group, 1964, and accompanying pamphlet on tests of the Company's refractory insulating bricks, n.d., 1963 or later, and letter, 1966 (2 pamphlets, 1 doc.) 1964, 1966, n.d.
- /B36 Folder, marked "Experimental Regener, Reversing Gear", containing correspondence, [1965], 1966, and notes, pages of brochures and other papers concerning correspondence with various firms regarding supply of an experimental regenerator, 1962-65, n.d. (1 folder containing docs.) 1962-66, n.d.
- /B37 Folder marked "Experimental Regen Unfiled Letters", containing correspondence, bills, plans, notes, extracts from publications and other papers concerning proposal for use of methane as above (esp. patenting it) and experimental regenerator, 1963, 1965-67, n.d., with also two printed copies of "curriculum vitae" of C.C. Middleton, 1948 or later, and copy of plan of gas reversing valve, [1955] (1 folder containing docs.) c.1948, [1955], 1963, 1966-67, n.d.
- /B38 Looseleaf vol. issued by Royal College of Advanced Technology, Salford, marked "Experimental Regenerator Instructions and Quotes", containing correspondence, plans and notes, 1966-67, n.d., and brochures (or extracts from them), 1962, 1966, n.d., of various firms relating to supply of components for an experimental regenerator (1 looseleaf vol.) 1962, 1966-67, n.d.
- /B39 Folder, marked "Experimental Regenerator", containing letters, plan, notes and other papers concerning a tender for upcast air fan (1 folder containing docs.) 1966, n.d.
- /B40 Stationery wallet, marked "Regen Filling", containing rough notes, plans and photograph concerning regenerator (1 stationery wallet containing docs.) n.d.

## UNOFFICIAL COLLECTIONS

## BUSINESS

- U262/B41 Looseleaf vol. issued by Royal College of Advanced Technology, Salford, containing: 1932-65, n.d.
- Plan of lengths of piping prepared for [patent] specification no. 13770/63 with name of agents Barlow, Gillett and Percival, annotated, presumably in connection with patent application by C.C. Middleton, ?1963;
- Rough notes on bricks, apparently in connection with a regenerator, n.d.;
- Rough notes and graphs relating to methane in coal mines and its possible use with regenerators as a fuel, incl. references to local collieries, esp. Mosley Common, 1962, 1965, n.d., and part of draft copy of paper by C.C. Middleton on this subject, n.d.;
- Letter to Woodall-Duckham Company (1920) Ltd. and graph, 1935, typed note regarding ovens of "Corby II" plant, 1935, and letter from Woodall-Duckham Vertical Retort and Oven Construction Co. (1920) Ltd., 1932, regarding heating up coke ovens; Rough notes regarding "Ducting" and "Surface Losses" apparently in connection with coke ovens producing gas, n.d.
- (1 looseleaf vol. containing docs.)
- /B42 Correspondence, 1963, typed copy of patent specification, 1963, and rough notes and plans on use of methane as above, n.d., with also reprint of article on large boiler plant design, 1962 (1 bdle.) 1962-63, n.d.
- /B43 Letter, 1966, and accompanying catalogues, 1965-66, and rough notes on same use of methane, n.d. (1 bdle.) 1965-66, n.d.
- /B44-52 Typed or other copies (often annotated) of specifications, correspondence and other papers (incl. copies of earlier patents) relating to patents obtained by C.C. Middleton on "utilisation of methane in mine air" (or "utilisation of weakly combustible air-fuel mixtures", according to title on one complete specification for British patent, 1966) in Britain, U.S.A., Belgium and Federal German Republic (1 doc., 8 folders containing docs.) 1963-67, n.d.
- /B53 Account, n.d., typed in English, of patent granted in France in 1953 for improvement in refractory furnace regenerators (1 doc. of 11 pages) [1953]
- /B54 Five pages typed in English containing slightly different and annotated version of part of statement as above, n.d. (1 doc.) n.d.



## UNOFFICIAL COLLECTIONS

## BUSINESS

- U262/B55 Photocopy, n.d., of printed statement of patent granted in Britain in 1930 for improvement to industrial thermal apparatus. (1 doc.) [1930]
- /B56 Folder, marked "Mine Air Stafford Colliery", containing rough notes (1 folder containing docs.) n.d.
- /B57 Folder, marked "Mine Air Schack Rummel Pasadena", containing published lecture, 1931, pages cut from Coal Quarterly (vol. 1, no. 3), 1962, and copies of publications, [1936-62], n.d., concerning regenerators, use of coal or burning of methane or exhaust gases (1 folder containing 10 copies of 6 published papers) 1931, [1936]-62, n.d.
- /B58 Folder, marked "Mine Air Costs", containing rough notes (incl. references to publications or dates in various years from 1948 to 1966), n.d., and annotated extracts from an annual report for year ending in 1965 (1 folder containing docs.) 1965, n.d.
- /B59 Folder, marked "Mine Air Notes of Talks.....", containing rough notes (incl. references to publications in years 1944 and 1954-55) (1 folder containing docs.) n.d.
- /B60 Folder, marked "Mine Air, Regen Size", containing rough plans and graphs, with one copy of graphs in a publication (1 folder containing docs.) n.d.
- /B61 Folder marked "Mine Air Drawings", containing drawings of schemes of boilers fired with upcast air and of related tubing and details as in paper in U262/B62-64 (1 folder containing docs.) n.d.
- /B62 Folder, marked "Mine Air Paper", containing various annotated copies of paper by C.C. Middleton, "Upcast Air as a Boiler Fuel. A New Source of Power" and various plans and rough notes (1 folder containing docs.) n.d.
- /B63 Envelope containing 3 copies of paper of title as in U262/B62, one annotated as read to the Institute of Fuel, Manchester, 6 Oct., 1964 (1 envelope containing 3 docs.) [1964]
- /B64 Envelope, containing copy of paper of title as in U262/B62-63 annotated...."Steen Atkinson Stordy" (1 envelope containing 1 doc.) n.d.
- /B65 Envelope, marked "BEG Corrected Diagram Turbine Diagram", containing copies of plans of one scheme of boiler fired with upcast air as in U262/B61 and plan of scheme incl. regenerators and referring to turbine compressor (1 envelope containing 5 docs.) n.d.

## UNOFFICIAL COLLECTIONS

## BUSINESS

- U262/B66 Envelope containing photocopies of rough notes: n.d.  
 One photocopy of notes headed "Million Ton Colliery" with reference to date in 1966;  
 Four photocopies of notes headed "Gas Turbine Middleton Version";  
 Two photocopies of notes headed "Upcast Air" (1 envelope containing 7 docs.)
- /B67 Folder, marked "Turbine Scheme", containing letter accompanying list of American firms, 1966, duplicated copy of paper on gas turbine developments, 1961, issue of Escher Wyss News (vol. 39, no.1), 1966, brochure on Thornton Power Station, Lancashire, n.d. (1959 or later), annotated copy of a paper on gas turbine developments, n.d. (1956 or later), and rough notes, n.d. (1 folder) 1961, 1966, n.d.
- /B68 Page headed "Pilot" with rough notes and sketches on burning methane (1 doc., once part of a loose-leaf folder or vol.) n.d.
- /B69 Newscuttings, 1960, 1964, n.d., and rough notes, n.d. regarding use of gas from gas fields in Sahara or elsewhere (1 bdle.) 1960, 1964, n.d.
- /B70 Article on coal carbonisation taken from Chemical and Process Engineering, with various markings, May, 1962 (4 pages stapled together) 1962
- /B71 Annotated copy of annual report and statement of accounts of the Institute of Fuel for the year 1964, 1965 (1 pamphlet) 1965
- /B72 Rough notes, graphs, photographic plates for printing, diagrams and copies of pages of publications, largely mathematical or relating to heat exchange (109 docs.) n.d.
- /B73 Page from Industrial and Engineering Chemistry, vol. 34, no. 7, July 1942, containing advertisement for a make of heat transfer unit (1 sheet) 1942
- /B74 Brochure on Karbate and National corrosion resistant heat exchange equipment, printed for National Carbon Company, Inc., New York and elsewhere in U.S.A., part of Union Carbide and Carbon Corporation (1 pamphlet) 1944
- /B75 Page with photographic illustration showing production of heat exchangers at Whessoe Works of Whessoe Darlington (1 sheet, possibly once part of a brochure) n.d.
- /B76 Page of catalogue showing pre-heaters of R. and J. Dempster Ltd., Gas Plant Works, Manchester (1 page) n.d.
- /B77 Brochure, on sulphuric acid cooling, printed for Q.V.F. Ltd., Duke Street, Fenton, Stoke-on-Trent, Staffordshire (1 leaflet) n.d.

## UNOFFICIAL COLLECTIONS

## BUSINESS

- U262/B78 Paper, preprinted for the meeting in 1937 of the American Institute of Chemical Engineers, on the condensation of mixed vapours (1 pamphlet) ?1937
- /B79 Reprints of articles and other copies of papers on heat transfer (9 pamphlets, 1 set of 3 sheets) [1937-1951]
- /B80 Issue of Chemical and Process Engineering, "Heat Transfer Survey", Grampian Press Ltd., London and elsewhere, Aug., 1965 (1 pamphlet) 1965
- /B81 Brochure (publication no. 214B), on fluid power equipment, printed for Maxam Power Ltd., Camborne, England, part of the Holman Group (1 looseleaf vol.) 1964
- /B82 Reprints advertising Cochran and Co. Annan Ltd., Annan, Dumfriesshire, Scotland, [1964-1965], and advertising brochures of same firm, 1965, n.d. (1 pamphlet, 3 leaflets) [1964]-65, n.d.
- /B83 The Chemical Engineer, no. 161, and Transactions of the Institution of Chemical Engineers, vol. 40, no. 3, June, 1962, one article on regenerators marked (1 vol.) 1962
- /B84-85 Issues of the Journal of the Institute of Fuel, vol. 36, no. 275, Dec., 1963, and vol. 39, no. 302, Mar., 1966, each with an article on gas marked (2 vols., U262/B85 in poor condition) 1963, 1966
- /B86 Printed text of paper on gas as an industrial fuel, Institute of Fuel (North Western Section), Nov., 1964 (1 vol.) 1964
- /B87 Pages from Iron and Coal of originals of two articles on removing methane from coal mines, 1961 (1 folder enclosing two sets of pages) 1961
- /B88 Envelope containing two photocopies, n.d., of newscuttings on use of methane for power, [1965] (2 docs., with some annotations, n.d.; photocopies of two articles as in U262/B87 removed; 1 envelope) [1965], n.d.
- /B89 Issue of The Mining Electrical and Mechanical Engineer, journal of the Association of Mining, Electrical and Mechanical Engineers, vol. 43, no. 507, Jan. 1963 (1 vol. marked with compliments of author of articles as in U262/B87) 1963
- /B90 Reprint from The Mining Engineer, transactions of the Institution of Mining Engineers, no. 62, Nov., 1965, on factors affecting methane extraction (1 pamphlet, annotated with compliments of author as in U262/B87) 1965

## UNOFFICIAL COLLECTIONS

## BUSINESS

2/B91 Envelope marked "Colliery Guardian", containing cutting from Colliery Guardian, with date added, 1964, and two photocopies, n.d., of same cutting (1 envelope containing docs.) 1964, n.d.

/B92 Page from publication of the Institution of Chemical Engineers, no. 64, June, 1963, containing marked article on the first degree in chemical engineering awarded in the British Commonwealth (1 sheet) 1963

## MAPS AND PLANS

/M1 R. and J. Dempster Ltd., Gas Plant Works, Manchester, engineers and contractors, Messrs. Woodall, Duckham (1920) Ltd. for Pretoria, ammonia liquor concentration plant (capacity 2 units 3,400 gallons), blueprint, diagram of one unit only, annotated incl. date in 1931 (no. 21782, "DR37610; 19/8/31; Pretoria" added) (1 doc., punched as if once part of looseleaf file) 1931

U262/M2-42 were found marked, presumably by C.C. Middleton, with numbers from 36 to 94 in crayon and have been arranged in the same order.

/M2-5 Blueprints, Woodall-Duckham Co., stamped by the Woodall-Duckham Vertical Retort and Oven Construction Co. (1920) Ltd., Allington House, Victoria Street, London, S.W.1., in 1931: 1928, 1931-32, n.d.

/M2 Thorncliffe, oven brickwork details, sheet 3, 1928 stamped in 1931 (marked 36, drawing no. 16542); 1928, 1931

/M3 Partington, oven brickwork, details, sheet 2, 1931 revised in 1932, marked, n.d. ("1929" on back) (marked 37 and 3, drawing no. 254961A); 1931-32, n.d.

/M4 Partington, cross section through coke oven battery, "Preliminary Dated 16.3.31", 193- (marked 38, drawing no. 25009); 1931

/M5 Partington, longitudinal plan of coke oven battery, "Preliminary Dated 16.3.31", 193- (marked 39, drawing no. 25008) 1931  
(4 docs., U262/M2 and /M5 torn)

U262/M6-7, 11-13, 16 are in German with some annotations in English in pencil, e.g. "Keteen Scrubbing Tower" (U262/M6).

/M6 Dr. A. Wacker, Gesellschaft für elektrochem. Industrie. G.M. b.H. Werk Burghausen, Umlaufwäscher 780 li Eisen gummiert-Baulange-5206 mm, 1940 revised in 1942 (marked 56, 5037/2228) (1 doc.) 1940, 1942

/M7 Dr. A. Wacker as above, Nachwäscher ... Eisen gummiert-Baulange-4620 mm (translated in added note as "Scrubber Iron Ruberised /sic/ Construction length ...") (marked 57, CM45 and CE Office copy, 5037/2238) (1 doc.) 1940

## UNOFFICIAL COLLECTIONS

## MAPS AND PLANS

- U 2/M8      Lansil Ltd., Caton Road, Lancaster, no. 3 coil (stainless steel I5), anhydride heating furnace, revised (marked 58, drawing no. CE2/14A) (1 doc., fragile, torn slightly, one or two fragments missing)      1946
- /M9      do., no. 2 coil stainless steel (Immac. 5) for anhydride heating furnace, revised (marked 59, drawing no. CE2/12A) (1 doc.)      1946
- /M10      do., no. 1 coil (stainless steel), anhydride heating furnace, revised (marked 60, drawing no. CE2/13A) (1 doc.)      1946
- /M11      Dr. A. Wacker as above, Krümmer und Aste für VA-Fe.-Liebigkühler mit neuer Flanschführung, 1940 revised in 1941 (marked 61 and "Keteen "Immaculate" Pipe Work Details", 5037/2232)(1 doc.)      1940-41
- /M12      Dr. A. Wacker as above, VA-Umlaufrohrenskühler (marked 62 and "Acetic Acid Vapourizer", 5037/2226) (1 doc.)      1940
- /M13      Dr. A. Wacker as above, Doppelgasofen (Mauerzeichg.) für Unterdruckanlage, 1936 revised to 1938 (marked 63 and "Keteen Wacker Furnace Design", Bi 5037/1231) (1 doc.)      1936-38
- /M14      British Furnaces Ltd., proposed layout of acetic anhydride plant, coloured and annotated (marked 64 and CM163, drawing no. F38245) (1 doc.)      1946
- /M15      Lansil Ltd. as above, flow sheet for catalytic section of anhydride plant (marked 65, drawing no. CE1/113) (1 doc., fragile)      1946
- /M16      Dr. A. Wacker as above, Spaltanlage - Schema für Anhydridanlage, 1943 revised in 1944, annotation, n.d., in ink referring to letter of 1946 (marked 66 and "Keteen Process Flow Diagram", Wa.5037/2459a) (1 doc. slightly torn)      1943-44, n.d.
- /M17      ICI (Explosives) Ltd., Nobel's Ardeer Factory, Research Engineering Section, ethyl cellulose manufacture, detail of continuous isolator and collecting tank, copy made in 1944 of plan of 1943 (marked 67, drawing no. 1014) (1 doc.)      [1943]-44
- /M18      Nobel's Explosives Co.Ltd., Ardeer, Engineering Division, ethyl cellulose manufacture, building no. ML4, detail of collecting system, copy made in 1944 of drawing of 1942 (marked 68, drawing no. 905) (1 doc.)      [1942], 1944



## UNOFFICIAL COLLECTIONS

## MAPS AND PLANS

- U262/M19 do., ethyl cellulose manufacture, building no. ML4, arrangement and details of syphon tank, copy made in 1944 of drawing of 1942 (marked 69, drawing no. 897) (1 doc.) [1942], 1944
- /M20 do., ethyl cellulose manufacture, flow diagram, copy made in 1944 of drawing of 1942 (marked 70, drawing no. 900) (1 doc.) [1942], 1944
- /M21 ICI (Explosives) Ltd., Research Engineering Section, T.M.N.M. pilot plant, detail of swing door for pressure filter (marked 71, drawing no. 958) (1 doc.) 1942
- /M22 do., copy made in 1944 of drawing as above (marked 72, drawing no. 958) (1 doc.) [1942], 1944
- /M23 ICI (Explosives) Ltd., Nobel's Ardeer Factory, Research Engineering Section, T.M.N.M. pilot plant, pressure filter, drawn in 1942 and traced in 1943 (marked 73, drawing no. 957) (1 doc., small fragments missing) [1942]-43
- /M24 ICI (Explosives) Ltd., Research Engineering Section, T.M.N.M. pilot plant, sight flow on pressure filter (marked 74, drawing no. 972) (1 doc.) 1942
- /M25 ICI (Explosives) Ltd., Nobel's Ardeer Factory, Research Engineering Section, copy made in 1944 of plan as in U262/M23 above (marked 75, drawing no. 957) (1 doc.) [1942]-44
- /M26 Scotts, London, S.W.1, engineers, "Scott" patent high vacuum glycerine distillation plant, small plan, annotated, drawn in 1942 and traced in 1943, annotated, n.d. (marked 79, M.6034) (1 doc., poor condition, partly repaired with cellotape) [1942]-43, n.d.
- /M27 Blueprint showing detail of spray nozzles, stamp of Simon-Carves Ltd. on back, n.d., and attached copy (marked "Mr. Middleton" and signed for Research Manager) from ICI (Explosives) Ltd. to Messrs. Simon-Carves Ltd., Bird Hall Lane, Cheadle Heath, Stockport (blueprint marked 80 and also with figure 836) (2 docs., joined together) 1944, n.d.
- /M28 ICI (Explosives) Ltd., Research Engineering Section, plastic cored fuse, details of traversing machine, copy made in 1944 of drawing of 1942 (marked 81 and "Wind Up Gear; Traverse Gear (Details)", drawing no. 1345) (1 doc.) [1942], 1944
- /M29 do., plastic cored fuse, arrangement and details of traversing machine, copy made in 1944, date of original obscured (marked 82 and "Wind Up: Traverse", drawing no. 1344) (1 doc.) 1944

## UNOFFICIAL COLLECTIONS

## MAPS AND PLANS

U2/M30	do., plastic cored fuse, arrangement of winding and traversing gear, copy made in 1944, date of original obscured (marked 83, drawing no. 1336) (1 doc.)	1944
/M31	do., cannel coal research, sectional arrangement of vertical retort, copy made in 1944 (marked 84, drawing no. 1724/1) (1 doc.)	1944
	U262/M32-40 relate to a proposed plastic wire covering machine, the word "nylon" sometimes being also added to the description.	
/M32	Nobel's Explosives Co. Ltd., Ardeer, Engineering Division, general arrangement, copy made in 1944 of tracing of 1939 (marked 85, no drawing no. shown) (1 doc.)	[1939], 1944
/M33	do., details, copy made in 1944 of tracing of 1939 (marked 85(a), R.12415) (1 doc.)	[1939], 1944
/M34	ICI (Explosives) Ltd., Research Engineering Section, arrangement and details of extruding die, copy made in 1944 of drawing checked in 1943 (marked 86, drawing no. 1316) (1 doc.)	[1943]-44
/M35	do., melting, metering, filtering and extrusion assembly, copy made in 1944 of drawing of 1943 (marked 87, drawing no. 1326) (1 doc.)	[1943]-44
/M36	do., details of pump block, copy made in 1944 of drawing of 1943 (marked 88, drawing no. 1318) (1 doc.)	[1943]-44
/M37	do., details of heating jacket for pump block, copy described as made in 1943 (presumably in error for 1944) of drawing of 1943 (marked 89, drawing no. 1317) (1 doc.)	[1943], ?1944
/M38	Nobel's Explosives Co. Ltd., Ardeer, Engineering Division, arrangement and details of pump block, copy described as made in 1943 (presumably in error for 1944) of tracing of 1939 (marked 90, R.12409) (1 doc.)	[1939], ?1944
/M39	ICI (Explosives) Ltd., Research Engineering Section, general arrangement (marked 91, drawing no. 1321) (1 doc.)	?1944
/M40	ICI (Explosives) Ltd., Research and Development Department, reeling arrangement, revised (marked 92, drawing no. 1563B) (1 doc.)	1944
/M41	ICI (Explosives) Group, Research Engineering Division, wedge wire screen, arrangement and details of silentbloc housing, copy made in 1944 of drawing of 1943 (marked 93, drawing no. 1134) (1 doc.)	[1943]-44

## UNOFFICIAL COLLECTIONS

## MAPS AND PLANS

- U262/M42 Plan with stamps of Nobel's Explosives Co. Ltd., Ardeer Engineering Division, and ICI (Explosives) Group, Research Engineering Division, ground nut oil extraction, building no. ML4, arrangement of experimental wedge wire filter, copy made in 1944 of plan of 1942 (marked 94, drawing no. 918) (1 doc.) [1942], 1944
- /M43-44 Copies of plan, origin not indicated, of special impulse process timing mechanism, 1946 revised to 1951, slight marking on U262/M44, n.d. (D6224/1 revision G) (2 docs. found in envelope with U262/M45-48 below) 1946-51, n.d.
- /M45-49 Simon-Carves Ltd., Stockport, Coke Oven and Washer Department: 1961-62, n.d.
- /M45-46 Plan for Richard Thomas and Baldwins Ltd., Newport, diagrammatic arrangement of hydraulic reversing system, 1961 revised to 1962 (1200/RTB/14/25, revision F) (2 docs.); 1961-62
- /M47-48 Plan for Richard Thomas and Baldwins, Spencer Works, schematic diagram for reversing winch control gear, revised (1200/RTB/27/42, revision F) (2 docs.); 1961
- /M49 Envelope found enclosing U262/M43-48 (1 envelope) (4 docs. and their enclosing envelope; this envelope, in poor condition, sent by Simon-Carves Ltd. to C.C. Middleton, date illegible, also found containing U262/M43-44 above) n.d.
- The following, U262/M50-65, were found in one bdl. Their origin is not shown apart from indications noted below.
- /M50-51 Mosley Common Colliery, Tyldesley Urban District, surface plan (scale 40 feet to 1"), showing railway line and various numbered buildings (2 docs., stained and small fragments of U262/M51 missing) n.d.
- /M52-54 Plan showing some of numbered buildings as in U262/M50-51 above together with approximate position of British Rail Wigan (North West) Line, U262/M54 annotated (3 docs., stained) n.d.
- /M55-57 Mosley Common Colliery, experimental regenerators, plan showing outline of part of same buildings as in U262/M52-54 above but with some slight differences (3 docs.) n.d.
- /M58-60 do., experimental regenerator, plan as U262/M55-57 above but with some measurements and markings added, initialled "CCM" with date in 1967 (3 docs.) 1967
- /M61-63 do., experimental regenerator, foundations, small plan and some details drawn roughly in ink on a tracing, together with two copies (3 docs., some staining) n.d.

UNOFFICIAL COLLECTIONS

MAPS AND PLANS

U262/M64

Section drawn in ink and called "Methane Drainage" showing tube from mine tunnel to surface, evidently intended to be impressionistic and not to indicate a particular site or proposal, marked in pencil on back "Mr. Middleton 2 - copies" (1 doc.)

n.d.

/M65

Rough annotated plan with such figures as "20°C" "420°C" and "1020°C" marked in places and "Wellman Incandescent Furnace Co. Ltd., Cornwall Rd., Smethwick, Birmingham" marked on back (1 doc., torn)

n.d.