

## APPENDIX 1

*(Referred to in paragraph (i) of the Introduction)*

### REFERENCE FROM THE BOARD OF TRADE THE MONOPOLIES AND RESTRICTIVE PRACTICES (INQUIRY AND CONTROL) ACT, 1948

#### CERTAIN INDUSTRIAL AND MEDICAL GASES

Whereas it appears to the Board of Trade that conditions to which the Monopolies and Restrictive Practices (Inquiry and Control) Act, 1948 applies prevail as respects the supply of each of the following descriptions of goods, that is to say:—

- (a) oxygen;
- (b) dissolved acetylene;
- (c) propane:

Now therefore the Board in pursuance of Section 2 (1) of the said Act hereby refer to the Monopolies and Restrictive Practices Commission for investigation and report the matter of such supply.

The Commission shall as respects such supply investigate and report on

- (1) whether the conditions to which the Act applies in fact prevail and if so in what manner and to what extent;
- (2) the things which are done by the parties concerned as a result of or for the purpose of preserving those conditions; and
- (3) whether the conditions in question or all or any of the things done as aforesaid operate or may be expected to operate against the public interest.

Dated this first day of February, 1954.

(Signed) M. J. DEAN.

A Secretary of the Board of Trade.

## APPENDIX 2

*(Referred to in paragraph (iv) of the Introduction and paragraph 108)*

### PRINCIPAL SOURCES OF EVIDENCE

Air Ministry  
Board of Trade  
British Constructional Steelwork Association  
The British Iron and Steel Research Association  
The British Oxygen Co. Ltd.  
BP Trading Ltd.  
British Standards Institution  
British Transport Commission  
The Butterley Co. Ltd.  
Calor Gas (Distributing) Co. Ltd.  
The Carbide Distributing Agency Ltd.  
Central Electricity Authority  
The Chesterfield Tube Co. Ltd.  
Colvilles Ltd.  
Department of Scientific and Industrial Research  
The Distillers Co. Ltd.  
Dorman Long (Steel) Ltd.  
Eagle Oil & Shipping Co. Ltd.  
Esso Petroleum Co. Ltd.  
The Gas Accumulator Co. (United Kingdom) Ltd.  
Hadfields Ltd.  
Home Office  
Imperial Chemical Industries Ltd.  
Kingston Chemicals Ltd.  
Lea & Son (Runcorn) Ltd.  
Lee-Midgley, Whitehead & Co. Ltd.  
Ministry of Fuel and Power  
Ministry of Health  
Ministry of Supply  
National Coal Board  
Rubery, Owen & Co. Ltd.  
Joseph Sankey & Sons Ltd.  
Saturn Industrial Gases Ltd.  
Shell-Mex & B.P. Ltd.  
The Shell Petroleum Co. Ltd.  
The Shipbuilding Conference  
The Steel Company of Wales Ltd.  
Stewarts & Lloyds Ltd.  
The United Steel Companies Ltd.  
Thos. W. Ward Ltd.

Evidence was also obtained from other Government Departments, 23 local authorities, 54 hospitals, Gas Boards and industrial users, including 34 iron and steel manufacturers, 43 motor car and motor accessory manufacturers, 24 electrical machinery manufacturers, 22 aircraft constructors, 36 general engineers, 6 public works contractors, 5 shipbreakers, 10 chemical manufacturers and 2 scrap metal merchants.

## APPENDIX 3

(Referred to in paragraph 2)

### THE PRODUCTION OF OXYGEN

The process of extraction of oxygen from the air either as liquid or as gas involves three fundamental phases, (a) air purification, (b) partial liquefaction of the air by compression and expansion, (c) separation into oxygen and nitrogen by fractional distillation.

Two main impurities have to be removed, namely carbon dioxide, which would solidify and choke the distillation column, and water vapour, which is always present in the air. Carbon dioxide is absorbed in contact with a solution of caustic soda in a scrubbing tower, generally after the first stage of compression of the air, while water is removed firstly by separation as liquid in the further stages of compression, and secondly either by refrigeration where it is deposited as ice, or sometimes by absorption on activated alumina.

Since oxygen liquefies at  $-183^{\circ}\text{C}$ . and nitrogen at  $-196^{\circ}\text{C}$ ., it is necessary to provide a large amount of refrigeration in order to liquefy sufficient of the air to enable liquid oxygen to be produced.

The air is compressed in stages, with cooling between stages, and refrigeration is obtained firstly by expanding a proportion of the compressed air in an engine whereby the air does work and thereby cools itself, and secondly by subjecting the compressed air in a heat exchanger to the flow of the cold nitrogen leaving the distillation stage.

In practice, it is found that if the air is subjected to a pressure exceeding 140 atmospheres (2,100 p.s.i.g.) and if 60 per cent. of this air is expanded in an engine, sufficient refrigeration will be produced to liquefy approximately 26 per cent. of the total air supplied. Since the amount of oxygen contained in the atmosphere is about 20 per cent. by volume, it is by this means technically possible to liquefy all the oxygen and provide sufficient refrigeration to overcome the ingress of heat and the other losses inherent in a process of this nature.

The liquid air so produced is then distilled or rectified to separate the oxygen. Rectification is carried out in two stages in a so-called double column. In the first or high pressure stage which is operated at about five atmospheres, the liquid air is separated into a nitrogen fraction, which is practically pure nitrogen, and an oxygen-enriched fraction which contains 35 to 40 per cent. of oxygen.

The oxygen-rich fraction from the bottom of the high pressure column is expanded into the second or low pressure column which is operated at only slightly above atmosphere pressure, while the nitrogen fraction from the top of the high pressure column is expanded into the low pressure column above the oxygen-rich fraction. This nitrogen fraction washes out the oxygen from the rising vapours of the oxygen-rich fraction. Thus the descending liquid becomes richer and richer in oxygen whilst the rising vapours become richer and richer in nitrogen. The nitrogen from the top of the column is used, as previously stated, to cool the compressed air. At the bottom of the column a liquid collects which has a purity of about 99.7 per cent. of oxygen and this is progressively withdrawn and stored in insulated storage tanks for distribution as required.

The equipment for liquefying and rectifying air operates at such a low temperature that it has to be completely insulated, and in practice non-combustible insulating materials having a very low conductivity, such as slag wool, are employed.

Plants from which oxygen is withdrawn as a gas operate on very similar principles, but much less refrigeration is required since less cold is removed from the cycle of operations by the withdrawal of gaseous oxygen as compared with that removed when the oxygen is withdrawn as liquid. Consequently the operating pressure and hence the power required is somewhat less and gaseous oxygen plants can be made to operate at pressures below 20 atmospheres.

## APPENDIX 4

(Referred to in paragraph 10)

### TECHNICAL TERMS USED IN THE IRON AND STEEL INDUSTRY

- Air enrichment* Oxygen is mixed with the combustion air supplied to the open hearth furnace or is blown into the furnace adjacent to the point of entry of gas or other fuel for firing. The resultant intensified combustion accelerates the melting process and leads to an increase of steel output and some fuel saving.
- Enrichment of air blast* Oxygen is added to the air blast which is blown into the molten metal in the Bessemer converter.
- Desiliconisation* }  
*Decarburisation* } These are methods for removing by oxidation the silicon and carbon contents of the metal and so accelerating the process of refining. Oxygen is injected through a lance into the ladle or the mixer of molten metal before it is put into the furnace, or by inserting the lance through the door of the furnace. The lance is consumed and the silicon and carbon content reduced. At one large steel works a patented process has been developed by which the oxygen is injected by means of a gun through the roof of the furnace; the oxygen penetrates through the slag into the molten metal and the gun is not consumed as it is kept above the surface and will therefore last for a number of operations. This method enables an exact carbon analysis of the steel to be obtained and refining can therefore be carried out to exact requirements. As silicon is reduced before carbon elimination begins, desiliconisation is carried out by lancing in the ladle or mixer. Very dense fumes are produced, which constitute a problem. Lancing for decarburisation in the furnace is a process which is becoming more widespread.
- Deseaming* }  
*Scarfing* } These are dressing operations to remove from the surface of steel ingots, blooms and billets any imperfections or irregularities which would adversely affect further fabrication of the steel. Oxygen is used to burn away the surface of the ingot, possibly up to  $\frac{1}{4}$  in., and the process may be done by hand with various types of torches and blowpipes or by machines which have rows of nozzles, whose areas of operation are arranged to overlap, so that the entire surface of an ingot on all four sides is treated at the same time. If the steel is already hot enough (i.e. over 1,000° C.), deseaming is done by oxygen alone, but when colder material is being treated an oxy-acetylene flame is initially applied for pre-heating, before the burning with oxygen can be operated. Propane may be used for pre-heating in deseaming.

## APPENDIX 5

(Referred to in paragraph 54)

### PROPANE AGREEMENT CONCLUDED BETWEEN IMPERIAL CHEMICAL INDUSTRIES LTD. AND SHELL-MEX & B.P. LTD., 13th AUGUST, 1941

The arrangements discussed between us to regulate the sale of Propane in the United Kingdom of Great Britain and Northern Ireland, and in Eire, for industrial processes excluding mineral oil refining, which arrangements are to be as follows:

(1) *Definition of Propane*

The term "Propane" means any hydrocarbon product consisting predominantly of Propane and/or Propylene.

(2) *Method of Sale*

All sales of Propane in the market defined above shall be made by Shell-Mex & B.P. Ltd. Imperial Chemical Industries Ltd. will not sell Propane into that market except through Shell-Mex & B.P. Ltd.

(3) *Participation of Anglo-American Oil Co. Ltd.*

It is envisaged that the Anglo-American Oil Co. Ltd. (and/or its Associated and Subsidiary Companies) may later by agreement between Shell-Mex & B.P. Ltd. and Imperial Chemical Industries Ltd. become a party to this agreement.

In this case, Shell-Mex & B.P. Ltd. and Imperial Chemical Industries Ltd. will meet together to agree amendment of quotas mentioned in paragraph (5) below, in order to make room for the Anglo-American Oil Co. Ltd.

(4) *Period of Agreement*

The arrangement will be for an initial period of fourteen months from November 1st, 1940, until 31st December, 1941, and will continue in force thereafter until terminated by either party giving the other twelve months' notice in writing.¶

(5) *Quotas*

The total sales of Propane for the agreed purposes shall be divided as follows:

- (i) Shell-Mex & B.P. Ltd. (and/or its Associated and Subsidiary Companies) shall have a minimum quota of 400 tons in any calendar year.
- (ii) Any sales in excess of 400 tons shall be divided as to 60 per cent. to Imperial Chemical Industries Ltd. (and/or its Associated and Subsidiary Companies) as to 40 per cent. to Shell-Mex & B.P. Ltd. (and/or its Associated and Subsidiary Companies).
- (iii) When the total sales shall have reached a figure of 2,400 tons in any year, then all sales in excess of 2,400 tons shall be divided equally between the two parties.

Under normal conditions the method for the adjustment of quotas shall follow so far as is appropriate and practicable that laid down in Schedule A. of the Butane Agreement between the parties.

It is recognised however, that should war conditions cause one party's supplies to fail either wholly or partly then the other party is at liberty to supply in excess of its quota in order to avoid restricting the total market. In this event it is understood that every effort will be made to adjust in each six-monthly period (i.e. January 1st to June 30th, and July 1st to December 31st) any disproportionate delivery carried forward into it from the previous six-monthly period, and if the party who has become under-delivered in any such six-monthly period fails to offer in the next following six-monthly period sufficient additional Propane to adjust the quota, then that party shall have no further claim in respect of such quantity as it shall have failed to offer.

As regards November and December, 1940, Shell-Mex & B.P. Ltd.'s minimum quota for the two months shall be one-sixth of 400 tons, i.e. 66·7 tons, and the price

to be paid to Imperial Chemical Industries Ltd. shall be based on the average sales price charged to buyers during those two months in the manner prescribed in paragraph (6) below.

(6) *Prices*

The price to be paid to Imperial Chemical Industries Ltd. by Shell-Mex & B.P. Ltd. shall be based on the average sales price charged to buyers.

When the average sales price is 6d. per lb. the price to be paid to Imperial Chemical Industries Ltd. shall be 1·8d. per lb. in cylinders provided by Shell-Mex & B.P. Ltd. to be placed free on rail or lorry at Billingham when full. If the average sales price is other than 6d. per lb. then the price to be paid to Imperial Chemical Industries Ltd. shall be in the same proportion to 1·8d. per lb. as the actual realised sale price is to 6d. per lb. If, however, the actual realised sale price exceeds 6d. per lb., any increase in the all-in container costs over the basic figure of 1·084d. per lb. shall be deducted before calculating the increased price to be paid to Imperial Chemical Industries Ltd.

Shell-Mex & B.P. Ltd. will certify to Imperial Chemical Industries Ltd. on or before the 31st July and the 31st January, the actual achieved average sales price in the half year ending the 30th June and 31st December respectively, and the certificate of the Chief Accountant of Shell-Mex & B.P. Ltd. shall be accepted by Imperial Chemical Industries Ltd. in confirmation of such declarations.

Any increase in the all-in container costs which would affect the price to be paid to Imperial Chemical Industries Ltd. will also be certified by the Chief Accountant of Shell-Mex & B.P. Ltd. and his certificate accepted by Imperial Chemical Industries Ltd.

Shell-Mex & B.P. Ltd. agree to consult Imperial Chemical Industries Ltd. before making any change in the schedule of re-sale prices. Imperial Chemical Industries Ltd. shall have the right to ask for a revision of sales prices, and Shell-Mex & B.P. Ltd. will not unreasonably withhold their agreement to such revision.

## APPENDIX 6

(Referred to in paragraphs 58 and 149)

### SUMMARY OF AGREEMENT BETWEEN THE BRITISH OXYGEN COMPANY LTD. AND THE STEEL COMPANY OF WALES LTD. FOR THE SUPPLY OF OXYGEN BY PIPELINE TO THE MARGAM WORKS

1. The agreement was concluded on 10th May, 1951. The preamble refers to a companion and in part related agreement made the same day between B.O.C. and British Industrial Solvents Ltd. (as agents for the Ministry of Supply) for the sale of nitrogen to the Ministry of Supply factory at Kenfig. It provides for building a B.O.C. factory on a site convenient to both the Steel Company of Wales's works and Kenfig, for the Steel Company of Wales to give help on obtaining way-leaves, etc. for the pipeline from the B.O.C. factory to their works, for the property in the pipeline and its branches to vest in B.O.C., and for B.O.C. to bear the cost of installation and to be responsible for maintenance.

2. The Steel Company of Wales shall purchase from B.O.C. and B.O.C. shall supply all the oxygen which the Steel Company of Wales shall require up to a maximum of 85 million cubic feet a year at a purity of 99.5 per cent. at a pressure of 250 p.s.i. If B.O.C. cannot for the time being supply the Steel Company of Wales's requirements, the Steel Company of Wales shall purchase not less than 40 million cubic feet a year.

3. B.O.C. shall invoice oxygen to the Steel Company of Wales at a basic price of 9s. 0d. a 1,000 cubic feet and nitrogen to British Industrial Solvents at a basic price of 1s. 6d. (the latter being subject, in the companion B.O.C./British Industrial Solvents agreement, to annual adjustments for quantity as shown in column 4 of the Table below and a minimum annual payment of £7,500). At the end of the year the Steel Company of Wales's payments shall be adjusted in accordance with the following Table and the other extracts from Clauses 8 and 9 cited below:

" 8. . . .

OXYGEN		NITROGEN		
1.	2.	3.	4.	5.
Volume Million cu. ft. p.a.	Scale price per 1,000 cu. ft.	Scale limit Million cu. ft. p.a.	Scale price per 1,000 cu. ft.	Total cost at scale rate
Over 40 under 45	9/-	Up to and incl. 125	1/6	£ 9,375
45 50	8/6	140	1/6	10,500
50 55	8/-	155	1/5	10,979
55 60	7/6	170	1/5	12,042
60 65	7/-	185	1/4	12,333
65 70	6/6	200	1/3	12,500
70 75	6/-	215	1/2	12,543
75 80	5/6	230	1/1	12,458
80 85	5/-	250	1/-	12,500

. . . . If the volume of nitrogen taken by the M.O.S. factory falls short of the quantity shown under the heading of Scale Limit (column 3) of the above Table against the range of oxygen volume taken by the Steel Company (column 1) the Steel Company will be charged with the amount by which the total volume of nitrogen actually taken calculated at the Scale Price for nitrogen (column 4) appropriate to the volume of oxygen taken or the amount of £7,500 whichever is the greater falls short of the Total Cost of nitrogen at the Scale Rate (column 5) also appropriate to the volume of oxygen actually taken . . . ."

" 9. In the event of the annual consumption of oxygen exceeding the maximum of 85,000,000 cubic feet indicated on the Table in Clause 8 and if the M.O.S. factory does not take nitrogen in excess of 250,000,000 cubic feet then the amount to be

realised from the Steel Company for oxygen and from British Industrial Solvents for nitrogen (taking into account that the minimum payment to be made by British Industrial Solvents for nitrogen shall be £7,500 per annum) shall be in total equal to the amount arrived at by multiplying the volume of oxygen taken by the Steel Company by a price of Nine Shillings per 1,000 cubic feet." In the event of British Industrial Solvents' demand for nitrogen rising above 250 million cubic feet there is provision for negotiating revised prices for oxygen taken by the Steel Company of Wales at a rate in excess of 85 million cubic feet a year. (And, in the companion agreement, for comparable negotiations with British Industrial Solvents on their nitrogen prices.)

---

*Note:* It appears from correspondence filed by B.O.C. with these Agreements that:

- (a) There was some understanding between the parties, but no provision in the Agreement, that the Steel Company of Wales should provide the unskilled labour, works' tackle, etc. required for the pipeline installation. In the event it agreed to bear a half of these expenses.
- (b) B.O.C. agreed, after the Steel Company of Wales's representations, to provide routine day-to-day maintenance for the Steel Company of Wales's pipeline. B.O.C.'s usual practice in such cases is to provide for periodic visits and overhauls by its engineers and to leave the ordinary day-to-day unskilled supervision to the customer's workmen.



## **APPENDIX 8**

*(Referred to in paragraph 62)*

### **THE BRITISH OXYGEN COMPANY LTD. SUBSIDIARY AND ASSOCIATED COMPANIES**

#### **HOME**

The Alliance Calcar Co. Ltd.  
Charles Bingham & Co. Ltd.  
British Industrial Gases Ltd.  
British Oxygen Aro Equipment Ltd.  
British Oxygen Chemicals Ltd.  
British Oxygen Engineering Ltd.  
British Oxygen Gases Ltd.  
British Oxygen Linde Ltd.  
Fusarc Ltd.  
Industrial Gases (I.F.S.) Ltd.  
Industrial Gases (Scotland) Ltd.  
A. Charles King Ltd.  
Medical Gases Ltd.  
Oxhycarbon Co. Ltd.  
Quasi-Arc Ltd.  
Sparklets Ltd.  
Thorn & Hoddle Ltd.

#### **OVERSEAS**

African Oxygen & Acetylene (Pty.) Ltd.  
The British Oxygen Canada Ltd.  
Burma Oxygen & Acetylene Co. Ltd.  
Ceylon Oxygen & Acetylene Co. Ltd.  
China Oxygen & Acetylene Co. Ltd.  
The Commonwealth Industrial Gases Ltd.  
Egyptian Oxygen & Acetylene Co. Ltd.  
The Indian Oxygen & Acetylene Co. Ltd.  
Industrial Gases (Malaya) Ltd.  
New Zealand Industrial Gases Ltd.  
Odda Smelteverk A/S Norway.  
Pakistan Oxygen & Acetylene Co. Ltd.

## APPENDIX 9

(Referred to in paragraphs 65 and 72)

### THE BRITISH OXYGEN COMPANY LTD.

#### LOCATION OF OXYGEN AND DISSOLVED ACETYLENE WORKS

District	Oxygen			Dissolved Acetylene†
	Liquid	Compressed	Medical*	
<i>Scotland (inc. N. Ireland)</i>				
Aberdeen ... ..		x T		
Belfast ... ..	x	x L		x
Dundee ... ..		x T		x
Glasgow ... ..				
Hillington (3 works) ... ..	x		x	x
Polmadie ... ..	x	x L		
Govan ... ..				x
Leith ... ..		x T		
<i>North-East</i>				
Billingham ... ..		x T		
Chester-le-Street ... ..	x	x L		x
<i>Lancashire</i>				
Barrow ... ..		x GT		
Bromborough ... ..		x TB		
Crewe ... ..		x T		x
Liverpool ... ..				x
Manchester ... ..	x	x LB		
Worsley ... ..	x	x L	x	x
<i>Yorkshire</i>				
Brinsworth ... ..	x			
Goole ... ..		x T		
Leeds ... ..	x	x L		
Rotherham ... ..	x	x L		
Sheffield ... ..				x
<i>Midlands</i>				
Aston ... ..		x T		
Bilston ... ..				x
Corby ... ..	x	x L		
Coventry ... ..		x T		
Derby ... ..		x T		
Hockley ... ..		x T		
Wolverhampton ... ..	x	x L		
<i>Western</i>				
Bristol ... ..		x T		x
Cardiff ... ..	x	x L		x
Margam ... ..	x	x L		
Plymouth ... ..		x T		
<i>London</i>				
Brentford ... ..			x	
Cricklewood ... ..				x
Erith ... ..		x B		
Greenwich ... ..		x GT		
Ilford ... ..		x B		
Ipswich ... ..		x T		x
Poplar ... ..				x
Southampton (2 works) ... ..		x T		x
Wembley ... ..	x	x LG		

#### *Compressed Oxygen*

- L from liquid oxygen produced at the same factory.
- T from liquid oxygen transferred by road from another factory.
- G from gas produced at the same factory.
- B from gas bought in.

\* *Medical Oxygen* is also produced at most of the factories making compressed oxygen but is not shown separately in the table. Those marked produce medical oxygen only.

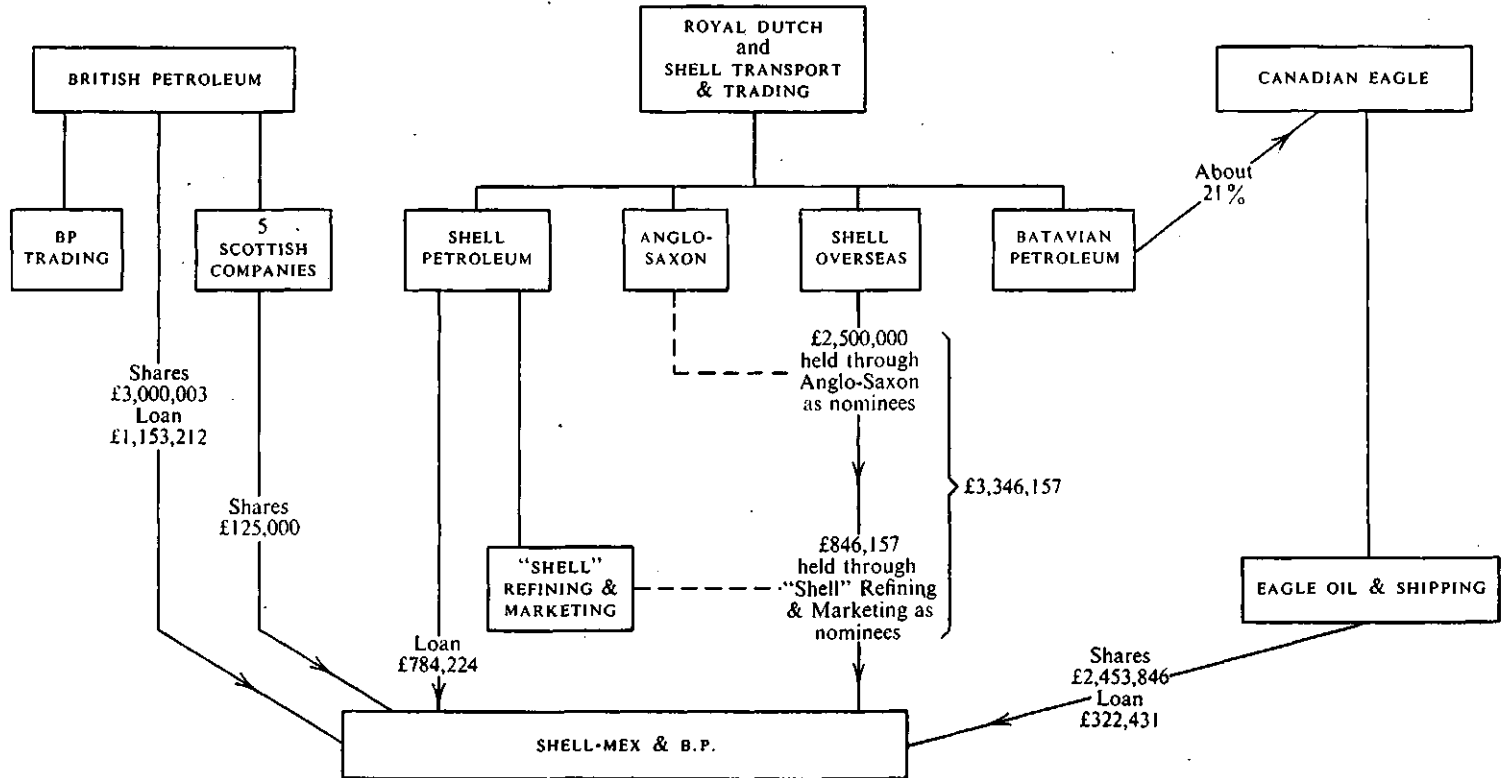
† *Dissolved Acetylene* is produced at the stations marked, but is also distributed to customers from other works where compressed oxygen is produced.



# APPENDIX 11

(Referred to in paragraph 98)

## SHELL-MEX & B.P. LTD. : PRESENT RELATIONSHIP TO PARENT COMPANIES



## APPENDIX 12

(Referred to in paragraph 99)

### AGENCY AGREEMENT DATED 31st DECEMBER, 1931: "SHELL" MARKETING CO. LTD., EAGLE OIL & SHIPPING CO. LTD., ANGLO-PERSIAN OIL CO. LTD. AND SHELL-MEX & B.P. LTD.

AN AGREEMENT made the 31st day of December 1931 Between "SHELL" MARKETING COMPANY LIMITED whose registered office is at St. Helen's Court Great St. Helen's in the City of London (hereinafter called "Shell Marketing") of the first part EAGLE OIL & SHIPPING COMPANY LIMITED whose registered office is at 16 Finsbury Circus in the City of London (hereinafter called "Eagle") of the second part ANGLO-PERSIAN OIL COMPANY LIMITED whose registered office is at Britannic House Finsbury Circus aforesaid (hereinafter called "Anglo-Persian") of the third part and SHELL-MEX AND B.P. LIMITED whose registered office is at St. Helen's Court aforesaid (hereinafter called "New") of the fourth part.

WHEREBY IT IS AGREED as follows:—

1. SHELL Marketing Eagle and Anglo-Persian are hereinafter sometimes collectively referred to as "the Consigning Companies."

2. THE duration of this Agreement shall be for 20 years from the 1st day of January 1932 (inclusive) and thereafter unless and until determined on the 31st December 1951 or on the 31st December in any subsequent year by not less than 24 calendar months' previous notice in writing given by the Consigning Companies to New or vice versa.

3. THE expression "Oil" shall embrace and include crude petroleum and each and every product of crude petroleum whether supplied to the consumer straight run cracked or as an admixture in whatever proportions of substances whether of other hydro-carbons or otherwise together with all other liquids or solids not being crude petroleum or any of its products but which may at any time be available and in demand to serve all or any purposes which may previously have been filled by crude petroleum and/or its products whether straight run cracked or as admixtures with other substances.

4. THIS Agreement shall not extend to or include lubricating oil bunkers wax or candles. The expression "lubricating oil" shall mean oil for the purpose of lubrication and the expression "bunkers" shall mean oil for the propulsion of sea-going vessels other than trawlers fishing-boats and similar smaller coasting vessels.

5. SUBJECT as hereinafter provided each of the Consigning Companies shall as from the 1st day of January 1932 inclusive during the continuance of this Agreement employ New as its sole and exclusive consignee and agent for the sale and distribution of oil for consumption within the whole area of the United Kingdom and the Irish Free State Isle of Man and Channel Islands (hereinafter called "the said area") and New shall as such consignee and agent use its best endeavours to promote the interests of the Consigning Companies and New shall not knowingly sell oil for resale outside the said area. ALWAYS provided that to the extent that the Consigning Companies respectively have for themselves or (in the case of the first two named of the Consigning Companies) through Shell-Mex Limited or (in the case of the last named of the Consigning Companies) through British Petroleum Company Limited assumed contractual obligations which are now subsisting and whereby oil has been entrusted for sale and distribution in the said area to organisations other than one of the Consigning Companies the Consigning Company concerned shall be free to observe and satisfy such obligations.

6. DURING the continuance of this Agreement the Consigning Companies shall not nor shall any of them be directly or indirectly interested except through the agency of New in the sale of oil for consumption in the said area save as in the last preceding clause provided.

7. NEW may at any time purchase on its own account any oil for resale on its own account but only for consumption in the said area and only if and so far as such purchases and resales of oil by New on its own account shall not interfere with or prejudice the sale by New of any oil which any of the Consigning Companies has the right and is under obligation to sell through New.

8. DELIVERY of the oil required by New as laid down in Clause 20 hereof shall be made by the Consigning Companies to New c.i.f. such ports in the said area as New may direct but such directions shall provide for adequate notice of shipments and have due regard to shipping conditions.

9. NEW as agent for sale under this Agreement shall have the fullest liberty in respect of the sale of oil delivered to it under this Agreement and may sell the same either in its own name or otherwise and in such manner and at such prices and upon such terms and conditions as it may think advisable.

10. NEW shall during the continuance of this Agreement provide all such means of inland transport storage packing handling sale and distribution distilling refining and treatment of oil as shall be necessary for the proper conduct of its business.

11. THE commission payable to New for its services as such agent shall be such as may from time to time be agreed between the parties hereto or in the absence of Agreement as may be determined by the Chairmen of Shell Marketing and Anglo-Persian jointly or failing agreement between them by a sole arbitrator appointed by them provided that no rate shall be fixed without the express agreement of New in respect of any product which would make the rate of commission payable less than the actual cost of effecting the sale of such product. Any such rate may be retrospective in its application if so agreed upon or determined.

It is agreed that the commission for No. 1 and No. 3 grades of Benzine shall be the same.

Should such commission as aforesaid not provide sufficient profit to enable New to depreciate its assets by an amount equal to at least the maximum amount allowed by the Income Tax Commissioners for the purpose of ascertaining the basis of profit upon which Income Tax is chargeable then it shall be an obligation upon the parties hereto to vary such commission in such manner as may be agreed between them or as in the absence of agreement shall be determined as aforesaid so as to ensure that the total profits earned by New shall be sufficient to make the before-mentioned depreciation.

This commission shall cover all expenses of whatever nature so that the Consigning Companies shall receive the gross selling price of all the products sold less only the said commission.

12. IF in the said area any of the products supplied by any of the Consigning Companies shall enjoy a fiscal advantage by way of Preferential Tariff or any similar privilege over the same products supplied by the others or other of the Consigning Companies such fiscal advantage shall accrue solely to the Consigning Company whose product enjoys it and import duties shall therefore not be a general charge but shall be a direct charge against the Company consigning the products by which the said duty is incurred.

13. FINAL accounts in respect of each calendar year shall as soon as practicable after the end of such year be made out and rendered by New to each of the Consigning Companies.

14. AT the end of each year before the preparation of such final accounts the Consigning Companies shall agree as to:—

- (A) The standard quality of each product for the purposes of the accounts.
- (B) The different qualities of such product delivered to New.

- (C) The differential in values necessary to adjust the product referred to under (B) to the standard of the product referred to under (A).

In the event of the Consigning Companies failing to agree on any of the said matters the same shall be determined by the Chairmen of Shell Marketing and Anglo-Persian jointly or failing agreement between them by a sole arbitrator appointed by them.

The differential so established shall be properly taken into account in ascertaining the proceeds of sale.

15. EACH of the Consigning Companies shall bear its due proportion of all shortages or losses by leakage or otherwise on each product in the proportion that the deliveries of such product to New made by it bear to the total deliveries of such product made to New by the Consigning Companies and by any other person firm or company from whom New may have purchased or received deliveries.

16. SEPARATE accounts shall be kept in respect of each product and each quality of each product delivered to New and sold by it.

17. EACH quality of each product delivered by each of the Consigning Companies shall be considered as forming part of the total quantity of that quality of such product received by New from all sources and the Consigning Companies shall participate in the net proceeds in respect of the total sales of such quality in the proportion that the quantity of such quality of product delivered by each of the Consigning Companies to New in each year bears to the total quantity of such quality of product delivered to New during that year.

18. THE total quantity of each quality of each product sold by New in each year shall be ascertained by adding to the stocks of each quality of such product held by New at the commencement of such year the quantity of the quality of such product delivered to it by the Consigning Companies or purchased by New during such period and deducting the stocks of such quality of such product held by New at the close of such year. Any quantity so purchased by New shall be deemed to have been sold by New during the year during which it is purchased save to the extent that the amount so purchased exceeds the total sold.

19. THE stocks left at the end of such year shall be ascertained and shall be allocated to the respective parties who have delivered them to New during the said year in the proportions that the deliveries made by each party respectively bear to the total deliveries received by New and the stocks shall be carried forward to the following year and deemed to be delivered by the respective parties for and on account of the following year.

20. NEW shall three calendar months before the 1st day of January and 1st day of July each year notify the Consigning Companies the approximate quantity of each quality of each product which it anticipates being able to market in the said area during the coming six calendar months commencing on such 1st January and 1st July and the Consigning Companies shall (subject to Act of God enemies of His Majesty the King or any foreign state fire flood tempest riot civil wars and commotions strikes lockouts or any other cause operating as force majeure) have the obligation and the right to supply such quantity of each quality of each product in the proportions specified in a Memorandum bearing even date herewith and signed by Frederick Godber and Robert Percy Brousson and William Fraser for identification as the Memorandum here referred to.

In the event of one petroleum product taking the place of another for a recognised trade the rights and obligations of the parties as regards their quotas shall not be altered for example if Kerosene is substituted for Benzine such Kerosene will as regards quotas be treated as though it were Benzine. And the above shall then represent the quota of each party and they shall accordingly be bound to deliver such quantities.

For any new petroleum products for which there is no quota each party shall have the right and obligation to supply such new products in the same proportion as its position exists in the products from which these new products are taken.

21. SHOULD any of the Consigning Companies having supplied oil to New desire to export oil of a similar kind from any of the installations of New in the said area to a destination outside the said area such Consigning Company shall be permitted so to do and the quantity of such oil which it has supplied to New shall be reduced accordingly but so that its right and obligation to supply for consumption in the said area shall be in no way varied. The Consigning Company exercising this right shall however reimburse to New any expenses including depreciation which New has incurred on the landing storing handling treating or blending of such exported oil but New shall not charge any profit on such expenses.

22. ON the requisition of a Consigning Company New shall provide all tankage necessary to enable the Consigning Company to carry on its business in bunkers and the Consigning Company shall pay for the use of such facilities a sum of three shillings and sixpence per ton on all deliveries ex tank. Should however the aggregate sum so paid by the Consigning Companies in each year not be sufficient to recoup to New the whole of the working expenses of the tankage relating to the said business in bunkers so provided by New together with a sum equal to 15 per cent. on the relative capital costs to New then the Consigning Company or Companies concerned shall pay to New such additional sum per ton on deliveries ex tank as together with the sums then already paid will equal the working expenses of such tankage together with the said 15 per cent. on such capital cost as aforesaid.

23. THE brands to be utilised for all sales to be effected by or on behalf of New shall be determined by New with a view to securing the greatest financial return and in this respect full consideration should be given to trade marks trade names and brands hitherto employed by the Consigning Companies either directly or indirectly in different parts of the said area subject always to the restriction that the marks previously used by Shell-Mex and the British Petroleum Company Limited shall never be used for products either straight run cracked or blended without the specific consent of Shell Marketing and Eagle in the first case and Anglo-Persian in the second case respectively. New shall be entitled to use free of charge trade marks trade names or brands registered or used by Shell-Mex Limited or British Petroleum Company limited in the said area and Shell Marketing and Eagle in the first case and Anglo-Persian in the second case warrant that they will procure that proper steps shall be taken to secure this result. In case of resale (other than for the purposes of amalgamation) or in case of liquidation (voluntary or otherwise) the said trade marks and trade names shall be retransferred as follows:—

- (1) As regards marks and names acquired from Shell-Mex Limited such of these as were originally acquired by Shell-Mex Limited from Shell Marketing shall be transferred as Shell Marketing shall direct and such of these as were originally acquired from Eagle or its predecessors shall be transferred as Eagle shall direct.
- (2) As regards trade marks and names acquired from British Petroleum Company Limited the same shall be transferred as Anglo-Persian shall direct.

24. THE trade marks and/or trade names referred to in Clause 23 hereof are as specified in a Memorandum bearing even date herewith and signed by Frederick Godber and Robert Percy Brousson and William Fraser for identification as the Memorandum here referred to.

IN WITNESS whereof the said parties to these presents have caused their respective Common Seals to be hereunto affixed the day and year first above written.

The Common Seal of "SHELL" MARKETING COMPANY } SEAL  
LIMITED was hereunto affixed in the presence of  
ANDREW AGNEW }  
A. S. DEBENHAM } *Directors*  
C. F. GREENSLADE } *Secretary*

The Common Seal of EAGLE OIL & SHIPPING COMPANY } SEAL  
LIMITED was hereunto affixed in the presence of  
R. P. BROUSSON }  
J. H. MACDONALD } *Directors*  
C. H. M. C. WILSON } *Secretary*

The Common Seal of ANGLO-PERSIAN OIL COMPANY } SEAL  
LIMITED was hereunto affixed in the presence of  
W. FRASER, *Director*  
JNO. CLARK, *Secretary*

The Common Seal of SHELL-MEX AND B.P. LIMITED was } SEAL  
hereunto affixed in the presence of  
W. FRASER }  
F. GODBER } *Directors*  
H. K. STEIN } *Secretary.*

## APPENDIX 13

(Referred to in paragraphs 165 and 217)

### THE BRITISH OXYGEN COMPANY LTD.: SALES OF OXYGEN AND DISSOLVED ACETYLENE AND AVERAGE PRICES, 1920 TO 1954

Year	INDUSTRIAL OXYGEN						MEDICAL OXYGEN						TOTAL OXYGEN INDUSTRIAL AND MEDICAL Million cubic feet	DISSOLVED ACETYLENE	
	COMPRESSED		LIQUID		TOTAL INDUSTRIAL OXYGEN Million cubic feet	Average price per 1,000 cubic feet	COMPRESSED		LIQUID		TOTAL MEDICAL OXYGEN Million cubic feet	Average price per 1,000 cubic feet		Million cubic feet	Average price per 1,000 cubic feet*
	Million cubic feet	Average price per 1,000 cubic feet*	Million cubic feet	Average price per 1,000 cubic feet			Million cubic feet	Average price per 1,000 cubic feet	Million cubic feet	Average price per 1,000 cubic feet					
	(1)	(2)	(3)	(4)	(5) [(1) & (3)]	(6)	(7)	(8)	(9)	(10)	(11) [(7) & (9)]	(12)	(13) [(5) & (11)]	(14)	(15)
		s. d.		s. d.		s. d.		s. d.		s. d.		s. d.			s. d.
†1919-20	176	43 8	—	—	176	43 8							176	12	228 10
1920-21	218	46 7	—	—	218	46 7							218	11	228 11
1921-22	167	46 8	—	—	167	46 8							167	13	208 3
1922-23	215	39 9	—	—	215	39 9							215	18	192 11
1924	328	32 7	—	—	328	32 7							328	19	184 10
1925	283	28 11	—	—	283	28 11							283	21	196 7
1926	251	28 4	—	—	251	28 4							251	24	175 8
1927	347	27 3	—	—	347	27 3							347	32	170 4
1928	375	26 11	—	—	375	26 11							375	36	158 11
1929	432	26 5	—	—	432	26 5							432	43	132 6
1930	396	24 6	—	—	396	24 6							396	45	115 10
1931	319	20 11	—	—	319	20 11							319	41	104 3
1932	335	19 1	7	13 8	342	19 1							342	45	99 7
1933	413	19 3	48	13 11	461	18 8							461	55	96 6
1934	517	19 4	76	13 10	593	18 8							593	74	95 4
1935	570	19 11	93	14 2	663	19 1							663	88	96 7
1936	658	20 3	138	13 5	796	19 1							796	105	97 1
1937	723	20 6	186	13 0	909	19 0							909	121	96 3
1938	663	22 10	234	14 2	897	20 7							901	125	98 11
1939	693	22 2	341	14 3	1,034	19 6	4	30 8	—	—	4	30 8	1,046	141	96 3
1940	762	23 11	574	14 9	1,336	19 11	15	58 6	—	—	15	58 6	1,351	176	107 7
‡1941	859	24 1	817	15 0	1,676	19 8	35	51 2	—	—	35	51 2	1,711	212	110 5
1942	1,030	24 10	1,096	15 7	2,126	20 0	60	44 6	—	—	60	44 6	2,186	271	127 7
1943	1,184	22 11	1,379	14 10	2,563	18 6	100	41 0	18	11 0	118	36 5	2,681	312	126 3
1944	1,209	20 10	1,399	14 10	2,608	17 8	131	32 4	197	11 0	328	19 6	2,936	315	113 5
1945	1,067	20 11	1,284	14 10	2,351	17 7	53	36 6	142	11 0	195	17 11	2,546	262	111 10
1946	1,093	22 5	1,288	14 7	2,381	18 2	32	57 9	15	11 0	47	43 3	2,428	262	113 10
1947	1,104	26 2	1,436	14 5	2,540	19 7	38	58 1	7	11 0	45	50 6	2,585	285	115 2
1948	1,319	26 10	1,841	14 4	3,160	19 6	46	56 6	11	11 0	57	47 8	3,217	351	115 7
1949	1,316	26 8	2,123	13 10	3,439	18 9	55	55 4	—	—	55	55 4	3,494	368	117 9
§1950	1,316	27 6	2,397	13 9	3,713	18 7	69	53 0	—	—	69	53 0	3,782	387	122 5
1951	1,366	29 1	2,638	14 3	4,004	19 4	82	54 6	—	—	82	54 6	4,086	406	129 10
1952	1,414	32 9	2,979	14 4	4,393	20 3	82	67 5	—	—	82	67 5	4,475	432	139 1
1953	1,390	32 10	3,389	14 2	4,779	19 7	95	64 4	34	11 6	129	50 5	4,908	444	147 9
1954	1,409	32 10	3,838	13 4	5,247	18 7	96	64 6	30	11 11	126	52 4	5,373	462	142 10

NOTES.—\* Prices for industrial compressed oxygen and dissolved acetylene do not include cylinder rentals.

† The average prices for the years 1920 to 1937 do not include carriage.

‡ High Flying Oxygen is included with Medical Oxygen except for the years 1949 to 1952. Sales of High Flying Oxygen were as follows:—

		Compressed Million cubic feet	Liquid Million cubic feet			Compressed Million cubic feet	Liquid Million cubic feet
1941	...	27	—	1946	...	4	15
1942	...	52	—	1947	...	2	7
1943	...	89	18	1948	...	2	11
1944	...	116	197	1953	...	9	33
1945	...	38	142	1954	...	16	28

§ From 1950 Compressed Oxygen figures include adjustment for Boyles Law (that is, the difference between the nominal and actual content of the cylinder) as follows:—

		Compressed Oxygen Industrial Million cubic feet	Medical Million cubic feet
1950	...	60	3
1951	...	114	7
1952	...	118	7
1953	...	116	8
1954	...	117	8

## APPENDIX 14

(Referred to in paragraph 169)

### THE BRITISH OXYGEN COMPANY LTD.

INDUSTRIAL LIQUID AND COMPRESSED OXYGEN AND DISSOLVED ACETYLENE, DISTRICT SELLING PRICES,  
COSTS AND PROFITS\*, 1953—AVERAGE PER 1,000 CUBIC FEET

DISTRICTS	LIQUID OXYGEN			COMPRESSED OXYGEN			DISSOLVED ACETYLENE		
	Realised Selling Prices	Costs	Profits as Percentage on Costs	Realised Selling Prices	Costs	Profits as Percentage on Costs	Realised Selling Prices	Costs	Profits as Percentage on Costs
	s. d.	s. d.	per cent.	s. d.	s. d.	per cent.	s. d.	s. d.	per cent.
Scotland (including Northern Ireland) ... ..	13 10	9 6	46	31 2	21 8	44	147 6	110 0	34
131 North East ... ..	14 3	8 6	67	29 11	20 1	49	143 0	92 11	54
Lancashire ... ..	15 2	10 10	40	34 1	24 8	38	152 3	105 5	44
Yorkshire ... ..	13 5	8 3	63	32 8	19 8	66	155 2	111 11	39
Midlands ... ..	14 9	9 8	52	33 7	24 2	39	150 2	104 0	44
Western ... ..	12 5	9 5	32	32 10	24 5	35	156 5	110 5	42
London (Greenwich) ... ..	16 4	11 9	39	36 4	24 8	47	161 1	112 5	43
London (Wembley) ... ..	17 6	12 3	43	38 8	27 2	42	163 7	113 0	45
Weighted Average ... ..	14 2	9 5	50	33 9	23 5	44	153 7	107 9	43

\* The costs do not include District and General Overheads, and the profit rates have been arrived at before taking account of this expenditure.

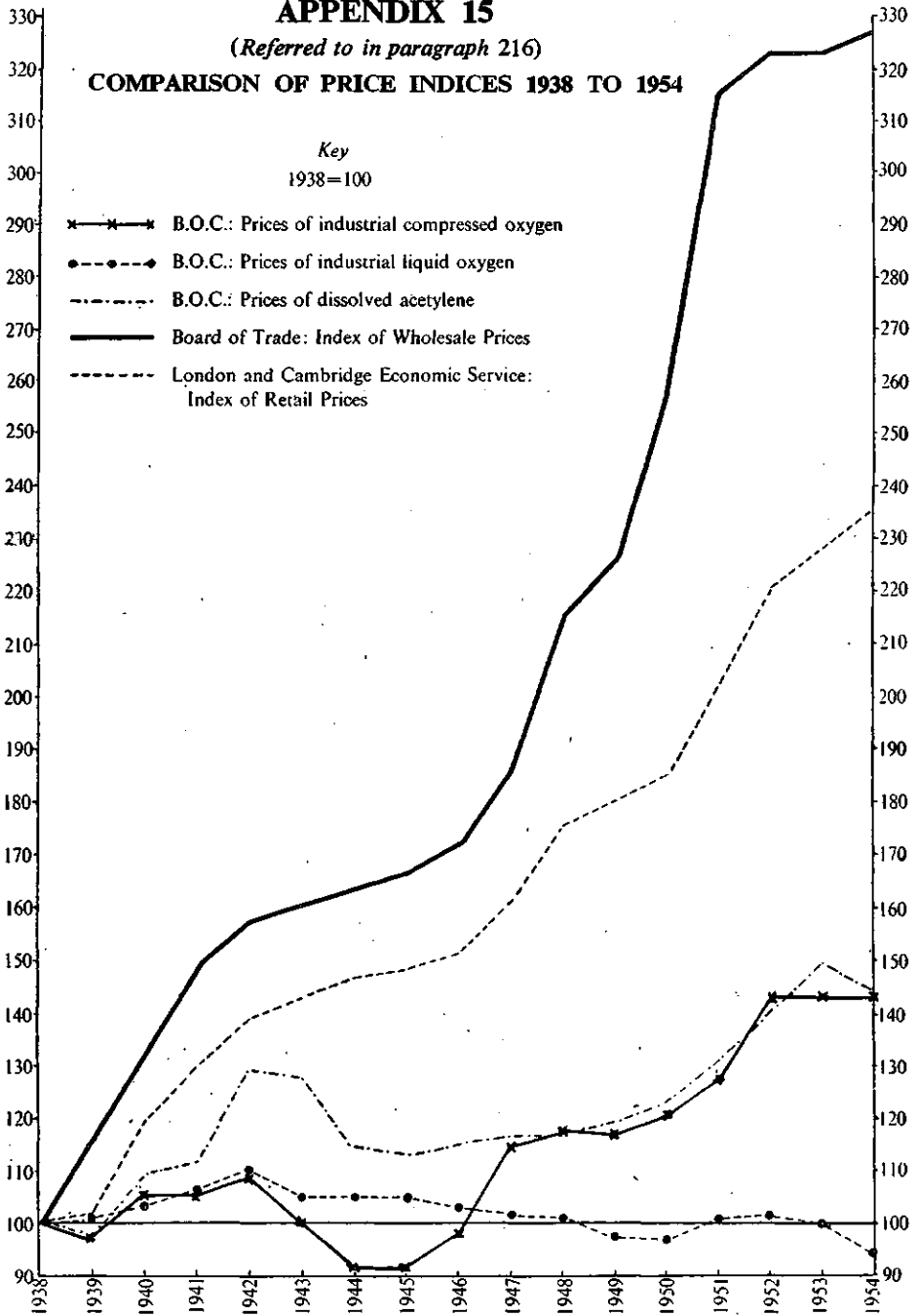
# APPENDIX 15

(Referred to in paragraph 216)

## COMPARISON OF PRICE INDICES 1938 TO 1954

Key

1938=100



## APPENDIX 16

(Referred to in paragraph 260)

### PROFIT AS YIELD ON AVERAGE CAPITAL EMPLOYED

WEIGHTED AVERAGE YIELDS FOR 23 INDUSTRY GROUPS COMPRISED  
OF COMPANIES WHOSE BALANCE SHEETS WERE PUBLISHED DURING  
THE FIRST THREE QUARTERS OF EACH OF THE LAST FOUR YEARS

Industry Group (Arranged in ascending order of yield for 1954)	Number of Companies (in 1954)	Year to which figures relate (see notes)			
		1951	1952	1953	1954
		per cent.			
<b>(i) MANUFACTURING</b>					
Rubber ... ..	224	28	12	6	11
Chemicals and Paint ... ..	67	14	10	12	13
Breweries and Distilleries ... ..	58	14	11	14	13
Cotton ... ..	36	23	8	11	13
Silk and Rayon ... ..	15	19	8	16	13
Iron and Steel ... ..	46	16	19	15	14
Wool ... ..	44	10	16	17	15
Other Textiles ... ..	36	19	12	15	15
Shipbuilding ... ..	11	17	16	14	16
Electrical Manufacturing ... ..	59	19	17	16	16
Clothing and Footwear ... ..	79	18	14	17	17
Tobacco ... ..	15	20	17	17	18
Miscellaneous Manufacturing ... ..	282	23	17	18	18
Food and Confectionery ... ..	108	18	14	18	19
Engineering ... ..	194	22	21	19	20
Newspapers, Paper and Printing ... ..	71	33	20	22	25
Motors, Cycles and Aircraft ... ..	74	21	20	25	27
Average for Manufacturing ...	1,419	19·4	15·4	16·6	17·2
<b>(ii) NON-MANUFACTURING</b>					
Shipping ... ..	27	19	17	11	8
Other Companies ... ..	366	9	9	10	10
Building ... ..	111	20	20	20	20
Shops and Stores ... ..	42	23	24	28	28
Tea ... ..	108	15	6	22	38
Oil ... ..	18	49	64	57	39
Average for Non-Manufacturing	672	19·4	21·1	21·1	19·4
ALL GROUPS ... ..	2,091	19·4	16·7	17·6	17·7

**NOTES:**

1. The data in this table have been prepared from statistics of Industrial Profits and Assets appearing quarterly in *The Economist*.

2. It has been assumed that the profits shown in the accounts published between January and September will have been earned mainly in the preceding calendar year. Thus the column headed "1954" relates to accounts published between January and September 1955. Figures from accounts published in the fourth quarter have been omitted because they are likely to relate to approximately half of the previous year and half of the year in which they are published.

3. The classification of industries between manufacturing and non-manufacturing is a broad one: it is probable that within each group there are some exceptions.

4. Capital employed has been calculated by taking the total assets, other than outside investments and goodwill items, and deducting therefrom current liabilities and provisions. Thus it is represented not only by share capital but all forms of borrowing (including debentures and bank overdrafts) and also capital and revenue reserves (including provision for future taxation).

5. Profit yields are based on the published profits (i) before deduction of taxation; (ii) before payment of interest on loans and overdrafts (which has been estimated at a rate of 4 per cent.), because these items are treated as capital employed; and (iii) after deducting non-trading profits (which have been estimated as equal to one-half of the non-recurring profits).

6. The figures given above very largely relate to "historical" capital (see paragraph 158). A few companies have, however, revalued their assets for balance sheet purposes and such cases will tend to reduce the average profit rates.

# INDEX

	<i>Pages</i>
Abbreviations ... ..	viii
Acetone: use of ... ..	3, 11, 53, 54
Acetylene ... ..	3
<i>see also</i> Dissolved acetylene.	
Agreements:	
Butterley and Air Products Inc. ... ..	48
common selling agent, <i>see under</i> Shell-Mex & B.P. Ltd.	
Esso and British Cutting Gases ... ..	33
Shell-Mex & B.P. and I.C.I. ... ..	20, 22, 25, 113-114
<i>see also under</i> British Oxygen Co. Ltd.	
Air Ministry: purchase of oxygen ... ..	29
prices to ... ..	58, 64, 100
Air Products, Inc., U.S.A.: oxygen plant supplier ... ..	76, 91
patent licence agreement ... ..	48
Aircraft Production, Ministry of:	
cost investigation ... ..	21
Heysham oil refinery ... ..	22, 24-25
Aktiengesellschaft für Industriegasverwertung (Heylandt) [A.F.I.] ... ..	43
oxygen plants in U.K. ... ..	15, 27, 42, 43
—patents acquired by B.O.C. ... ..	12, 14-15, 27, 43
B.O.C.'s comments ... ..	43, 74, 75
Allen, Sidney ... ..	19
Allen-Liversidge Ltd.... ..	11-12, 13
acquired by B.O.C. ... ..	12, 13-14
Anglo-American Oil Co., <i>see</i> Esso Petroleum Co. Ltd.	
Area Electricity Boards: B.O.C.'s agreements with ... ..	63
Associated Portland Cement Manufacturers Ltd.: group contract with B.O.C. ... ..	57
B.P. Trading Ltd. [The British Petroleum Co. Ltd.]: propane producer ... ..	6, 20, 35
common selling agent, <i>see under</i> Shell-Mex & B.P. Ltd.	
costs and profits... ..	68, 86
—Commission's comments ... ..	102
general interests and position ... ..	34, 121
prices ... ..	67, 102
sales, 1953-1955 ... ..	8
Bingham, Charles H.... ..	15, 16
Bottogas Ltd. ... ..	37
Brin's Oxygen Co. Ltd. ... ..	9
British Constructional Steelwork Association: evidence ... ..	39-40
British Cutting Gases Ltd. ... ..	20, 23, 33
British Gas & Torch Co. Ltd. ... ..	24
British Industrial Gases Ltd. [B.I.G.]:	
costs and profits... ..	61-62
history ... ..	15
oxygen and dissolved acetylene: manufacturer and supplier ... ..	7, 20, 30-31
prices ... ..	20, 31, 62
propane distributor ... ..	8, 31
sales ... ..	7-8, 61
subsidiary of B.O.C. ... ..	12, 15, 20, 26
—non-disclosure of ownership, <i>see under</i> British Oxygen Co. Ltd.	

British Industrial Solvents Ltd. [B.I.S.]:	
agreement with B.O.C. and Steel Company of Wales ...	24, 57, 115-116
calcium carbide producer ...	53-54
—direct sales to B.O.C. ...	54, 93
subsidiary of The Distillers Co. Ltd. ...	54
British Iron and Steel Research Association: B.O.C. co-operate with	23-24, 47
British Liquid Air Ltd.: Claude patents ...	75, 72
acquired by B.O.C. ...	10, 18
British Oil and Cake Mills Ltd.: produce electrolytic oxygen ...	7
British Oxygen Co. Ltd. (The) [B.O.C.] ...	12-18
acquisition of competitive interests ...	10, 42-43
—B.O.C.'s comments ...	74-75
—Commission's conclusions ...	92
acquisition of patents, <i>see under</i> Patents.	
agreement with L'Air Liquide ...	10, 43-44
—Allen-Liversidge Ltd. ...	13-14
—British Industrial Solvents and Steel Company of Wales	24, 57, 115-116
—George Cohen Sons & Co. Ltd. ...	18-19
—Gesellschaft für Lindes Eismaschinen A.G. ...	32, 50-51, 75
—Hydrogen, Oxygen & Plant Co. Ltd. ...	13
—Knowles Oxygen Co. Ltd. ...	10-11
—Lever Bros. Ltd. ...	10-11
—Linde Air Products Co., U.S.A. ...	19, 44-46, 75
—Linde British Refrigeration Co. Ltd. ...	9
—Liquid Air Ltd. ...	16, 42
—Messer G. m. b. H. of Frankfurt ...	16, 42-43, 74-75
—Metal Industries Ltd. ...	14
—Edgar J. Rees Ltd. ...	16-17
—Shell-Mex & B.P. ...	37, 102
—Siebe Gorman Ltd. ...	46
—Supply, Ministry of ...	21
—Union Carbide and Carbon Corporation, U.S.A. ...	19, 44-46
—Thos. W. Ward Ltd. ...	17-18, 57
calcium carbide, interest in ...	52-54, 66
—Commission's conclusions ...	93
capital issued, 1938-1956 ...	26, 117
capital requirements: Commission's comments ...	95-96, 107
case for ...	73-84
Commission's conclusions and recommendations ...	88-107
contract, conditions of ...	30
—B.O.C.'s case ...	76-77
—Commission's conclusions and recommendations ...	92-93, 100
contracts, group ...	55, 57-58
costs ...	59-61
B.O.C.'s comments ...	83
Commission's comments ...	96-97, 105
—dissolved acetylene ...	60-61, 65-66, 127
—district ...	127
—oxygen ...	60-65, 127
—propane ...	60-61, 69
—transport and delivery ...	66
cylinders ...	28, 29, 51
—conditions for loan of ...	28, 30
—B.O.C.'s comments ...	79-80
—Commission's conclusions ...	89
—development ...	78-79
directors ...	26
distribution, methods of: oxygen and dissolved acetylene ...	27-28, 29
—propane ...	22-23, 29

B.O.C. Ltd.—*contd.*

dividends paid, 1938–1956	117
efficiency of: Commission's comments	89
history of development, 1886–1939	9–20
—1939–1945	20–22
—1945 on	23–24
management	26–27
monopoly position, development and preservation of, <i>see above</i> acquisition of competitive interests and contract, conditions of.	
— <i>see below</i> oxygen plant.	
— <i>see also</i> Fighting companies; Saturn Industrial Gases Ltd.; competition with B.O.C.	
oxygen plant, <i>see under</i> Oxygen plant.	
price policy: B.O.C.'s case	80–83
—Commission's conclusions and recommendation	96–101, 104, 107–108
—delivered prices	6, 27, 29, 55
B.O.C.'s case	82
Commission's conclusions	98
—medical oxygen	58–59, 100
—national scheme: industrial oxygen and dissolved acetylene	21–22, 55–56
B.O.C.'s case	82–83
Commission's conclusions	96–98, 105–106
—special customers	24, 55, 56–58
B.O.C.'s case	82
Commission's conclusions	98–99
—users' comments	39–41
prices: average, 1920–1954	Appendix 13
—comparative price index graph	128
—oxygen and dissolved acetylene	55–56, 58–59
—propane	69
—relationship to costs	60
production: oxygen and dissolved acetylene	27, 29, 119
profits	60–61
—B.O.C.'s comments	83–84
—Commission's conclusions and recommendation	94–96, 100, 101, 103, 104, 107–108
—on dissolved acetylene	60–61, 65, 127
—on oxygen	60–62, 64, 127
—on propane	60–61, 69–70
public interest: B.O.C.'s comments on	84
purchaser: electrolytic oxygen	7, 27, 76
—propane	25, 29, 36, 37, 38
research and development	24, 47–48
—B.O.C.'s comments	78–79
—Commission's conclusions	89–90, 101
sales: oxygen and dissolved acetylene	7, 11–12, 15, 23, 60–63, 65, Appendix 13
—propane	8, 23, 69
structure of company	26–27
subsidiary companies	118
<i>see also</i> British Industrial Gases Ltd.; British Oxygen Engineering Ltd.; British Oxygen Linde Ltd.; Industrial Gases (Scotland) Ltd.; Odda Smelteverk A/S Norway; Oxhycarbon Ltd.	
subsidiary companies, non-disclosure of ownership of	15, 16, 31
—B.O.C.'s comments	77
—Commission's conclusions and recommendation	92
technical services to customers: B.O.C.'s comments	79–80
—Commission's conclusions	89
—pipeline installation	27–28, 29, 30
works, location of	119

	<i>Pages</i>
British Oxygen Engineering Ltd. ... ..	27, 49
British Oxygen Gases Ltd. ... ..	26, 105
British Oxygen Linde Ltd.: formation ... ..	50
B.O.C.'s comments ... ..	75-76
Commission's comments ... ..	91
British Petroleum Co. Ltd. (The), <i>see</i> BP Trading Ltd.	
British Railways: oxygen producer ... ..	42
purchaser of the gases ... ..	28, 37, 38
British Standards Institution: specifications ... ..	3
British Transport Commission: purchaser of the gases ... ..	33
Butane:	
agreement, Shell-Mex & B.P. and I.C.I. ... ..	20
propane, alternative to ... ..	5
—price relationship ... ..	69, 86
suppliers ... ..	7, 39
Butterley Company Ltd. (The): entry into plant market ... ..	48-51, 76, 91
Calcium carbide:	
distribution methods ... ..	52, 53, 54
European cartel ... ..	52
imports ... ..	5, 52
production in U.K. ... ..	20, 24, 52-54
use in dissolved acetylene production ... ..	3-4
<i>see also under</i> British Industrial Solvents Ltd.; British Oxygen Co. Ltd.	
Caledon Shipbuilding & Engineering Co. Ltd.:	
oxygen plant acquired by B.O.C. ... ..	13, 18
Caledonian Power Co. Ltd. ... ..	52-53
Calor Gas (Distributing) Co. Ltd.: propane distributor ... ..	7, 37, 39, 68
Canadian Eagle Oil Co. Ltd. ... ..	33
Carbide Committee, United Kingdom ... ..	52, 55
Carbide Distributing Agency Ltd. ... ..	53, 54, 93
Carbide (Voluntary) Control Committee ... ..	53
Chesterfield Tube Co. Ltd.: cylinder manufacturer ... ..	51, 52, 75
Chloride Purchasing Co. Ltd.: group contract with B.O.C. ... ..	57
Cohen, George, Sons & Co. Ltd.: oxygen plant acquired by B.O.C. ... ..	13, 16, 18-19
Colvilles Ltd.: group contract with B.O.C. ... ..	58
Conclusions and recommendations, Commission's:	
oxygen and dissolved acetylene ... ..	88-101
—addenda ... ..	104-106
—reservation ... ..	107-108
propane ... ..	101-103
Consett Iron Co. Ltd.: supply of oxygen to ... ..	51
Contracts, Conditions of, <i>see under</i> British Oxygen Co. Ltd.	
Costs:	
petroleum companies ... ..	68-69
<i>see also under</i> British Oxygen Co. Ltd.; Saturn Industrial Gases Ltd.	
Cylinders ... ..	3, 4
government regulations concerning ... ..	3-4
manufacturers ... ..	51-52
patents concerning ... ..	11, 13, 29
<i>see also under</i> British Oxygen Co. Ltd.	
Dalglish Brothers: oxygen and dissolved acetylene distributor ... ..	7

	<i>Pages</i>
Deseaming process ... ..	19, 112
licensing of patents ... ..	19, 44-46, 75
use of gases for ... ..	5, 41
Dissolved acetylene:	
cylinders ... ..	3-4, 11, 13, 51-52
distributors ... ..	6-7
history of industry ... ..	11-14, 15, 19-20, 21
prices, <i>see under</i> British Oxygen Co. Ltd.; Saturn Industrial Gases Ltd.	
producers ... ..	6-7
— <i>see also</i> British Oxygen Co. Ltd.; Saturn Industrial Gases Ltd.; Gas Accumulator Co. (United Kingdom) Ltd.	
production, method of ... ..	3
—government regulations concerning ... ..	3-4
propane, alternative to ... ..	22-23, 41, 78, 84-85, 86-87, 94, 103
sales in U.K. ... ..	7, 23
supply, method of ... ..	3
uses of ... ..	5, 11
Distillers Co. Ltd. (The), <i>see</i> British Industrial Solvents Ltd.	
Distribution, <i>see under</i> Oxygen. <i>see also</i> distributors <i>under</i> Dissolved acetylene and Propane.	
Eagle Oil & Shipping Co. Ltd.: propane supplier ... ..	6, 35
common selling agent, <i>see under</i> Shell Mex & B.P. Ltd.	
general interests and position ... ..	35, 121
prices ... ..	67
sales ... ..	8
Esso Petroleum Co. Ltd. [Esso]: propane producer ... ..	6, 20, 22-23, 24, 32-33, 85
British Cutting Gases, agreement with ... ..	33
—relations with ... ..	20, 22
costs and profits... ..	68-69, 85, 102
distributor customers ... ..	20, 32, 33
percentage of total U.K. propane trade ... ..	71
—Commission's conclusions ... ..	101-102
prices ... ..	67-68, 70, 85
purchases of propane ... ..	37
sales ... ..	33, 37, 39
Exclusive agreements: buying ... ..	17, 18, 45
<i>see also</i> British Oxygen Co. Ltd.: contracts, conditions of.	
Fighting companies, B.O.C.'s ... ..	15, 16, 20, 31
B.O.C.'s comments ... ..	77
Commission's conclusions and recommendation ... ..	92
Fuel and Power, Ministry of ... ..	5, 22
Gas Accumulator Co. (United Kingdom) Ltd.(The): dissolved acetylene producer ... ..	7, 39, 51-52, 54
Gas Boards: propane ... ..	33, 38
Gas Cylinders (Conveyance) Regulations, 1931 ... ..	78
Gas Industries Company, Pittsburg: agreement with Saturn ... ..	19, 22
Gesellschaft für Lindes Eismaschinen A.G. of Wiesbaden (Linde of Germany) 9, 43	
arrangement with Saturn ... ..	32
patents ... ..	9, 13, 75, 78
relations with B.O.C. ... ..	32, 47, 48-51, 75, 91
tonnage plant, development of ... ..	46
<i>see also</i> Linde British Refrigeration Ltd.	
Government departments concerned with the gases § ... ..	5
<i>see also</i> Fuel and Power, Ministry of; Supply, Ministry of; Trade, Board of.	

	<i>Pages</i>
Government interest in The British Petroleum Co. Ltd. ... ..	34
Government regulations ... ..	3-4, 5, 78
Harvey, G. A. & Co. (London) Ltd.: oxygen plant acquired by B.O.C.	13, 19
Heylandt, <i>see</i> Aktiengesellschaft für Industriegasverwertung.	
Home Office: safety regulations ... ..	3-4, 5, 78
Howards of Ilford Ltd.: electrolytic oxygen producer ... ..	7
Hughes Bolckow Shipbreaking Co. Ltd. (The): oxygen interests ... ..	13, 16
Hydrogen, Oxygen & Plant Co. Ltd.: acquired by B.O.C. ... ..	12, 13
Imperial Chemical Industries Ltd [I.C.I.]:	
agreements with Shell-Mex & B.P. ... ..	20, 22-23, 25
calcium carbide manufacturer ... ..	53, 54
costs and profits: propane ... ..	68-69, 86, 102
distributors, supply to propane ... ..	6, 22-23, 25, 29, 37, 38
oxygen production ... ..	46, 51
percentage of total U.K. propane trade ... ..	71, 88
—Commission's conclusions ... ..	101-102
prices, propane ... ..	29, 67, 68, 70
propane producer ... ..	6, 22-23, 37-38
relations with B.O.C. and oil companies ... ..	38
sales, propane ... ..	8, 38
Imports:	
calcium carbide ... ..	5, 52
oxygen plants ... ..	15, 27, 42-43, 91
—lease/lend ... ..	21, 53
Imtas Investment Trust Ltd. ... ..	31
Industrial Gases (Scotland) Ltd. [I.G.(S.)]:	
sales ... ..	7-8
subsidiary of British Industrial Gases Ltd., <i>see</i> British Oxygen Co. Ltd.:	
subsidiary companies.	
Iron and Steel Corporation of Great Britain ... ..	84, 107
Iron and steel industry: use of gases ... ..	4-5, 23-24, 41
Kingston Chemicals Ltd.: medical oxygen supplier ... ..	7
Knowles Oxygen Co. Ltd.: acquired by B.O.C. ... ..	10-11, 12
Lea & Son (Runcorn) Ltd.: oxygen producer ... ..	6, 38, 51
Lee-Midgley, Eric ... ..	20, 23, 38
Lee-Midgley Whitehead & Co. Ltd.: propane distributor ... ..	7, 38
purchases ... ..	33
Lever Brothers Ltd.: oxygen producer ... ..	7, 10-11
Linde Air Products Company, U.S.A.:	
agreement with B.O.C. ... ..	19, 44-46, 75
sales of oxygen plant to U.K. ... ..	21, 27
Linde British Refrigeration Ltd.: Linde subsidiary ... ..	9
acquired by B.O.C. ... ..	12, 13
Linde, Carl von ... ..	9, 10, 19
Linde of Germany, <i>see</i> Gesellschaft für Lindes Eismaschinen A.G.	
Liquid Air Ltd.: oxygen producer ... ..	12
acquired by B.O.C. ... ..	12, 16, 22
supplier of oxygen plant ... ..	14, 15, 42, 74
Liquid Oxygen Co. Ltd., <i>see</i> Liquid Air Ltd.	
Manufacturers, <i>see</i> producers <i>under</i> Dissolved acetylene; Oxygen; Propane.	
Market sharing ... ..	10, 17, 20, 22, 25
<i>see also</i> Shell-Mex & B.P. Ltd.: common selling agent for propane.	

	<i>Pages</i>
Marmic Investment Trust Ltd. ... ..	31
Messer G.m.b.H., Frankfurt: sales of oxygen plant to U.K. <i>see also</i> Oxhycarbon Ltd.	14, 15, 42
Metal Industries Ltd.:	
B.O.C.'s special terms to ... ..	57
relationship to B.O.C. ... ..	14, 26
<i>see also</i> Oxygen Industries Ltd.	
Mobil Oil Co. Ltd.: propane purchaser ... ..	38
New Process Gases Ltd.: propane importer ... ..	20
acquired by Saturn ... ..	23
Odda Smelteverk A/S Norway [Odda] ... ..	52, 53, 54, 66, 93
Oxhycarbon Ltd.:	
agent for Messer plant ... ..	16, 19, 42-43, 74-75, 91
subsidiary of British Industrial Gases ... ..	16
—non-disclosure of ownership, <i>see under</i> British Oxygen Co. Ltd.:	
subsidiary companies.	
Oxygen:	
cylinders ... ..	3, 51
distribution ... ..	6-7, 27-29, 31, 38-39
electrolytic ... ..	3, 7, 10, 27, 76
gaseous ... ..	3, 6, 27-28, 32, 75
high flying ... ..	28-29, 58, 64, 100, Appendix 13
history of industry ... ..	9-22, 23-24
liquid ... ..	3, 6, 27, 75, 81
—acquisition of patents for ... ..	12, 14-15, 19, 75
—user installation ... ..	23
medical ... ..	28-29, 58-59, 64-65, 100
pipeline ... ..	3, 6, 23, 27-28, 32
—agreement concerning ... ..	24, 56-57, 115
prices, <i>see under</i> British Oxygen Co. Ltd.; Saturn Industrial Gases Ltd.	
producers ... ..	6-7
— <i>see also</i> British Oxygen Co. Ltd.; Lea & Son (Runcorn) Ltd.;	
Saturn Industrial Gases Ltd.	
production, method of ... ..	3, 111
sales in U.K. ... ..	7, 20-21
supply, methods of ... ..	1, 6, 27-28, 32
tonnage ... ..	46-51, 55-56, 75-76
uses ... ..	4, 5, 23-24
Oxygen Industries Ltd. ... ..	14
acquired by B.O.C. ... ..	12-13, 14-15, 74
Oxygen Plant:	
"customer" ... ..	14, 15, 18-19, 42-43
—B.O.C.'s policy ... ..	46-51
supply, B.O.C. control over ... ..	16, 42-46
—case for ... ..	74-75
—Commission's conclusions ... ..	90-91
tonnage ... ..	3, 46-51
—Linde-Frankl ... ..	47
—Rescol-Air ... ..	47, 51
<i>see also</i> British Linde Ltd.; Butterley Company Ltd.; Imports;	
Oxhycarbon Ltd.; Societe L'Air Liquide.	
Patents:	
acetone ... ..	53
calcium carbide ... ..	53
cylinders ... ..	11, 13, 29
dissolved acetylene ... ..	29

	<i>Pages</i>
<b>Patents—contd.</b>	
oxygen production	48, 90
—acquired by B.O.C.: Brin's	9
Claude	10, 13, 75, 78
Hampson	9
Heylandt	14-15, 27, 43, 74, 75, 78-79
Linde Air Products	19, 27, 44-46, 75
Linde of Germany	9, 13, 75, 78
—acquired by Butterley Co. Ltd.	48
—acquired by Saturn	19
propane production	19
Petrocarbon Developments Ltd.	49
Plymouth Oxygen Co. Ltd. (The): oxygen plant acquired by B.O.C.	12-13, 16, 74
<b>Prices:</b>	
calcium carbide	52, 54
local agreement on oxygen, B.O.C. and T. W. Ward Ltd.	17
oxygen and dissolved acetylene, <i>see under</i> British Oxygen Co. Ltd.;	
Saturn Industrial Gases Ltd.	
propane	67-68, 70, 86-87, 102
— <i>see also under</i> British Oxygen Co. Ltd.; Imperial Chemical Industries	
Ltd.; Saturn Industrial Gases Ltd.	
users' views	31, 39-41
<b>Producers of gases, <i>see under</i> Dissolved acetylene; Oxygen: Propane.</b>	
<b>Profits:</b>	
petroleum companies	68-69
<i>see also under</i> British Oxygen Co. Ltd.; Saturn Industrial Gases Ltd.	
<b>Propagas</b>	23
<b>Propane:</b>	
dissolved acetylene, alternative to	22-23, 41, 78, 84-85, 86-87, 94, 103
distributors	6-7, 33
history of industry	20, 22-23, 24-25
prices	67-70, 102
producers	6
— <i>see also</i> BP Trading Ltd.; Esso Petroleum Co. Ltd.; Imperial	
Chemical Industries Ltd.; Shell Petroleum Co. Ltd.	
production, method of	4, 32-33
sales in U.K., 1953-1955	8
uses	5
Propylene	4, 5, 34, 35, 38
Pyrogas	23
Rainville Engineering Ltd.	24
<b>Recommendations, Commission's, <i>see</i> Conclusions and recommendations,</b>	
Commission's.	
Rees, Edgar J., Ltd.: oxygen plant acquired by B.O.C.	13, 16-17, 74
Reference, Terms of	1, 71, 109
<b>Research and development:</b>	
B.O.C.	47, 49-50, 78-79
—Commission's comments	89-90, 101
oxygen in steel industry	47
propane as a fuel	38
Royal Dutch/Shell Group	34
Rubery Owen & Co. Ltd.: cylinder manufacturer	52
Sales of gases in U.K.	7-8
Sankey, Joseph, & Sons Ltd.: cylinder manufacturer	52

Saturn Industrial Gases Ltd. [Saturn]:	
carbide, purchasers of ... ..	54
competition with B.O.C. ... ..	21-22, 24, 63
—B.O.C.'s comments ... ..	77
—Commission's conclusions ... ..	92, 102, 103
constitution of company ... ..	31
costs ... ..	67
cylinders, purchase of ... ..	51-52
formation ... ..	19-20
oxygen and dissolved acetylene producer ... ..	6
oxygen plant ... ..	32, 74
prices: oxygen and dissolved acetylene ... ..	67
—propane ... ..	70, 84-85
profits: on oxygen and dissolved acetylene ... ..	67
—on propane ... ..	70
propane distributor ... ..	6, 23, 32, 33, 68, 88
—percentage of total U.K. trade ... ..	71-72, 88, 102-103
sales ... ..	7-8, 32
subsidiary companies ... ..	23, 24
—see also British Cutting Gases Ltd.; New Process Gases Ltd.	
users' comments ... ..	40
Shawinigan Chemicals Ltd. ... ..	53
Shell Chemicals Ltd.: oxygen plant ... ..	51
Shell Petroleum Co. Ltd.: propane producer ... ..	6, 25, 34
common selling agent, see under Shell-Mex & B.P. Ltd.:	
costs and profits ... ..	68, 101-102
general interests and position ... ..	34, 121
prices ... ..	67, 86-87, 102
sales ... ..	8
"Shell" Refining & Marketing Co. Ltd. ... ..	25, 34, 51
see also Shell Petroleum Co. Ltd.	
Shell-Mex & B.P. Ltd.:	
agreement with B.O.C. ... ..	37, 102
—Commission's conclusion ... ..	101-102
agreements with I.C.I. ... ..	20, 22-23, 25, 113
common selling agent for propane ... ..	6, 20, 29, 34, 35-36, 122
—Commission's conclusions ... ..	71, 101, 102
cylinders, ownership of ... ..	29
general interests and position ... ..	35, 121
prices ... ..	67, 68
profits ... ..	68-69
purchases ... ..	36, 38
sales ... ..	8, 36-37, 38-39
Shipbuilding Conference: evidence ... ..	39-40
Siebe Gorman & Co. Ltd.: agreement with B.O.C. ... ..	46
Société L'Air Liquide (of France) [L'Air Liquide]: oxygen plant ... ..	46, 50, 91
relations with B.O.C. ... ..	10, 43-44
see also British Liquid Air Ltd.	
Southern Oil Co. Ltd.: produce electrolytic oxygen ... ..	7
Standard Oil Co., New Jersey ... ..	32
Standard/Socony Group ... ..	35-36
Steel Company of Wales (The) [S.C.O.W.]: supply of oxygen to ... ..	49-50, 51, 63
agreement with B.I.S. and B.O.C. ... ..	24, 56-57, 115
oxygen prices to ... ..	56-57, 63
Stewarts & Lloyds Ltd.: tonnage oxygen plant ... ..	48, 50, 51

	<i>Pages</i>
Supply, Ministry of:	
B.O.C. contracts ... ..	58
calcium carbide supplies ... ..	24, 53, 54
war-time arrangements: oxygen and dissolved acetylene ... ..	21, 22-23
Technical information: exchange of ... ..	10
<i>see also</i> Research and development.	
Thomas, Richard & Baldwins Ltd.: supply of oxygen to ... ..	51
im Thurn, J. C., & Sons Ltd. ... ..	19, 22, 31
Tilling Association Ltd.: B.O.C. group contract with ... ..	57-58
Trade, Board of: production responsibility ... ..	5, 54
Union Carbide and Carbon Corporation, U.S.A. ... ..	15
<i>see also</i> Linde Air Products Company, U.S.A.	
Users:	
evidence ... ..	31, 39-41, 110
types of ... ..	39
Uses of the gases ... ..	4-5
Ward, Thos. W., Ltd.: oxygen interests acquired by B.O.C. 13, 15-16, 17-18, 42, 43	
B.O.C. prices to ... ..	57
Welding: gas and electric ... ..	41, 78
White, S. H. ... ..	20, 32
Whitehead, L. G. ... ..	38
Witnesses ... ..	110

W