

UNIVERSAL
LIBRARY

OU_152840

UNIVERSAL
LIBRARY

OSMANIA UNIVERSITY LIBRARY

Call No. 330.11 K89 I Accession No. 19269

Author: Krando Herman

Title: Introductory ... materials.

. This book should be returned on or before the date last marked below.

THE
INTERNATIONAL DISTRIBUTION
OF RAW MATERIALS

THE INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

BY

HERMAN KRANOLD

*Associate Professor of Economics,
Talladega College.*

LONDON :

GEORGE ROUTLEDGE & SONS LTD.,
BROADWAY HOUSE, 68-74, CARTER LANE, E.C.

First published 1938.

“ That resources for war are to be obtained by abstention from ordinary consumption is an old doctrine.”

—F. Y. EDGEWORTH,
Papers Relating to Political Economy, III, 218.

TABLE OF CONTENTS

	PAGE
LIST OF STATISTICAL TABLES	xi
LIST OF GRAPHS	xviii
REFERENCES AND SOURCES	xix
PREFACE	xxi

CHAPTER

I. REVIEW OF INTERNATIONALLY INTERESTING RAW MATERIALS	I
A.—Metals: 1. Iron. 2. Aluminium. 3. Chromium. 4. Copper. 5. Gold and Silver. 6. Lead. 7. Manganese. 8. Nickel. 9. Quicksilver (Mercury). 10. Tin. 11. Zinc (Spelter). 12 and 13. Metals of the Platinum Group and Minor Metals	2
B.—Non-Metallic Minerals: 1. Coal. 2. Oil. 3. Asbestos. 4. Salt. 5. Mineral Fertilizers. 6. Sulphur. 7. Minor Non-Metallic Minerals	41
C.—Vegetable and Animal Raw Materials: 1. Cereals, including Wheat Flour and Rice. 2. Sugar. 3. Rubber. 4. Timber. 5. Wood Pulp. 6. Oil Seeds. 7. Cotton. 8. Minor Textile Fibres: Flax, Hemp, Silk, Jute. 9. Wool. 10. Artificial Silk (Rayon)	54
D.—Appendix: 11. Electrical Energy.	80
II. THE FIELD OF OUR STUDY	81
1. Use of the term " Raw Materials "	81
2. Materials of Multiple Use. Compound Substances. Natural Substitutes. Artificial Substitutes	82
3. Variations in Scales of Values of Commodities	83
4. Details of the Development of the International Trade in Foodstuffs. Money as a Gauge of Quantities in International Trade.	85
5. The Foodstuffs excluded from our Review	90
6. The Uncertainty of our Statistical Data	91
III. STABILITY AND VARIABILITY IN THE " NATURAL " CONDITIONS OF PRODUCTION	92
1. Climate and its Changes. Dodging Climatic Difficulties	92
2. Transformation of Soils by Cultivation and Manuring	94
3. Variations and Intentional Changes in the Quantity and Quality of the Supply of Labour	94
4. The Necessarily Provisional Character of the Results of this Study	97

CHAPTER	PAGE
IV. THE EXISTING DISTRIBUTION OF RAW MATERIALS .	99
A.—The Raw Material Resources of the More Important Countries	99
1. Calculation of Index Figures of the Wealth in Raw Materials for 15 Countries	99
2. Discussion of the <i>Real</i> "Haves" and "Have-Nots" .	105
(1) The Plutocrats among the Nations	105
(2) The Upper Middle Class among the Nations	106
(3) The Lower Middle Class among the Nations	106
(4) The Proletarians among the Nations	107
3. Particular Questions Concerning the British "Empire" .	107
B.—The Importance of Raw Materials	111
(a) Security of the Standard of Life	112
(b) Price and Range of Consumption	117
C.—Non-Economic Uses of Raw Materials	126
(a) Peace-time Production is not sufficient in War-time	128
(b) Peace-time Production cannot go on in War-time	128
(c) The War-time Outlook for the Big Seven	130
(d) Shortage of Labour in War-time	132
(e) The Bunkum of "Control" :	
(1) Control in Peace-time	134
(2) Control in War-time	135
(f) Security of Transport in War-time	136
(g) Stocks and Scrap Materials.	136
D.—The Unreality of It All	139
E.—The Cluster of Real Problems	140
V. THE RATIONALIZATION OF THE DISTRIBUTION OF RAW MATERIALS	142
A.—Rationality of Production :	
1. Disinvestment ; the Gospel of the Cheapest Field	147
2. Mono-Cultivation ; the Gospel of Specialization	151
B.—Economizing Labour :	
(1) The Problem of the "Rest"	154
(2) Stability of Employment	154
C.—Rationality of Use :	
(1) Distribution of Investments :	
(a) Previous Bankruptcies	159
(b) Depreciation of Debts	160
(c) General Development Expenditure	160
(d) First Robbing of the Soil	161
(2) The Web of Financial Obligations	161

TABLE OF CONTENTS

ix

CHAPTER	PAGE
VI. THE POLITICAL PROBLEMS OF RAW MATERIAL SUPPLIES	165
A.—Raw Materials in Peace-time :	
1. International Purchasing Power	165
2. Payment of International Debts	165
(a) by Migration	167
(b) by Transfer of Currency Metal	167
(c) by Sale of Commodities and Services :	
(1) Monopolist Exports.	169
(2) Competitive Exports.	170
(d) by Transfer of Investments.	
3. Dodging the Currency Problem by Annexations	171
4. International Currency	172
(a) The Difficulties Involved.	
(b) Its Incomplete Efficiency.	
(c) The Inflationist Complication.	
5. Protectionism and Free Trade	175
(a) Protection of the Home Market.	
(b) The Alternatives to Protectionism :	
(1) Mass Emigration.	
(2) New Large Industries.	
(c) Allow the World to Grow into its Clothes :	
(1) A Policy of smoothing out Surpluses and Deficiencies from Year to Year.	
(2) Gradual Building-up of International Planning.	
6. The Present Boom	180
B.—Raw Materials in War-time :	
1. War-time Production of Raw Materials	182
2. Transport of Raw Materials	184
3. Planning	186
VII. RAW MATERIALS AND INTERNATIONAL PLANNING	188
A.—Scientific Prerequisites of International Planning	188
B.—A Central Economic Planning Authority.	189
C.—Political Conditions	191
D.—Psychological Conditions	192
APPENDIX : STATISTICAL TABLES	194
INDEX	267

LIST OF STATISTICAL TABLES

A.—TABLES CONTAINED IN THE TEXT

(*Note* —All these tables have the sign T before their number.)

	PAGE
T1—Production of Iron and Steel, 1800-1921	3
T1a—Annual Average Increase of Steel Production	3
T2—Scrap Metal Marketed in the U.S.	4
T2a—Metals Recovered in the U.S.	4
T3—Consumption of Scrap Iron in Germany, 1929-1934	6
T4—Prices for Steel and Scrap, 1913-1936	6
T5—Scrap Iron in Exports from U.S., 1923-1934	7
T6—World Exports of Scrap Iron, 1929-1935	7
T7—Percentage Distribution of World Supplies of Iron Lodes	9
T8—World Dispersion of Resources and Production of Iron, in per- centages	11
T9—The Wealth of Italy and Japan in Iron	11
T10—Order of Rank in Production of Iron and Steel, 1913-1934	12
T11—Iron Industry in "Satisfied" and "Dissatisfied" Countries, 1913-1934	13
T12—World Exports of Iron Ore, 1932-1934	14
T12a—Value of World Trade in Gold Marks, 1913-1924	14
T12b—Values of World Trade, 1929-1935	15
T12c—Divergences in Import Surpluses in World Trade, 1929-1935	15
T13—Increases in Certain Iron Prices, 1932-1936	16
T14—Coal Production in Certain European Countries, 1913 and 1929	16
T15—Exports of Cryolite from Greenland, 1929-1935	18
T16—Order of Rank of Bauxite-Producing Countries, 1929 and 1934	19
T17—Germany: Consumption of Aluminium, 1929-1935	20
T18—Copper Production in Some Countries, 1929	22
T19—Rank of Countries in Production of Copper, 1913-1934	23
T20—Changes in Relative Importance of Some Countries in the Pro- duction of Copper Ores, 1913-1934	23
T21—Production of Copper in Ores and of Copper Metal, 1913-1934	25
T22—Changes in the Production of Copper in Ores and of Copper Metal, 1913-1934	25
T22a—Proportion of Copper Produced from Scrap, Germany, 1913-1925	25
T23—Rank of Countries Producing Copper Ore and Copper	26
T23a—Balance-Sheet of "Dissatisfied" Nations in Regard to Copper, 1933-1935	26
T24—Copper Consumption of Three Countries, 1934	27
T25—Distribution of Gold Stocks, 1934	29
T26—Distribution of Gold Stocks by Countries, 1934	29
T27—Gold in Possession of Government of India, 1913-1934	30
T28—Losses of Gold from India, 1931-1934	30
T29—Nickel in Foreign Trade of the U.S., 1921-1934	33
T30—Production of Nickel in the U.S., 1915-1934	33

	PAGE
T31—World Trade in Nickel, 1928-1930	34
T32—Production and Consumption of Tin, 1925-1935	36
T33—Colonial Production of Tin, 1929 and 1934	36
T33a—Prices for Banca Tin at Hamburg, 1905-1914 and 1924-1935	37
T33b—Monthly Price Movements of Banca Tin at Hamburg, 1934-1936	38
T33c—Percentage Distribution of Coal by Regions, 1935	43
T34—Probable Date of Exhaustion of Natural Resources of Oil	46
T35—Percentage Distribution of Oil Production by Continents, 1934	47
T36—Prices of Heavy Oils, 1929-1935	48
T37—Percentage Distribution of Wheat Production by Continents, 1933	56
T38—Distribution of Production of Barley and Oats by Continents, 1933	57
T39—Comparison of Grain Harvests and Population by Continents, 1933	58
T39a—Share of Some Countries in World Trade in Certain Foodstuffs and Fodders in Per Cent. of World Totals, 1913 and 1924	58
T40—World Exports of Cereals, 1929-1935	59
T41—Falls in Grain Prices in Germany, Poland and the Argentine	60
T42—Decline in Indian Rice Exports, 1929-1934	60
T43—Percentage Shares of Beet and Cane in Total Sugar Production	64
T44—Distribution of Rubber Production by Continents, 1925-1934	68
T45—Importation of Pulp Wood into Certain Countries, 1933	70
T46—World Exports of Fats, 1929 and 1933	71
T47—Colonial and Non-Colonial Production of Oil Seeds, 1933-34	73
T48—Production of Cotton-Seed in Russia, 1925-1933, according to Different Statistical Sources	73
T49—Cotton Production in China, 1927-1934	75
T50—Rank of Chief Cotton-Producing Countries, 1934	75
T51—Sheep Population in Relation to Human Population, by Countries	78
T52—Comparison of Production of Cotton and Rayon, 1912-1934	79
T53—Exports and Imports of Certain Foodstuffs; Germany, 1930-1935	86
T54—Index Figures of International Trade; Exports Only; 1929=100	87
T55—Percentage Share of Certain Classes of Commodities in International Trade, 1929-1934	88
T56—Changes in the Foreign Trade in Some Foodstuffs; Germany, 1930-32 and 1933-35	89
T56a—Normal and Actual Rainfall in India, 1919-1928	92
T57—Shifting of Distribution of Copper Production, 1913-1934	97
T58—Unweighted and Weighted Marks of 15 Countries for Wealth in Raw Materials	102
T59—Weighted Marks of 15 Countries for Wealth in Raw Materials, Compared with their Population	102
T60—INDEX OF WEALTH IN RAW MATERIALS FOR 15 COUNTRIES	103
T61—RELATIVE IMPORTANCE OF 15 COUNTRIES ACCORDING TO THEIR WEALTH IN RAW MATERIALS	103
T62—Possible Corrected Marks of 15 Countries in Regard to Their Wealth in Raw Materials	104
T63—Motherland and Colonies of Three Empires	107
T64—Calculation of Aggregate Marks for the British Empire	110
T65—Price Movements of Iron and Steel in Western Europe, 1929-1936; Index Figures	119
T66—Statistics of Markets for Tin, 1929-1936, with Index Figures	120
T67—Index Figures of Total Harvests in Germany, 1914-1918	129
T68—Germany's Production of Coal and Pig Iron, 1913-1918	129
T69—Germany's Labour Reserves	132
T70—Nickel in War-time in the U.S.	137
T70a—International Distribution of Gold Stocks, 1900-1932	169
T70b—Gold stocks in U.S. and France, 1900-1935	169
T71—Impact of Import Duties on U.S. Trade, 1929-1935	176

B.—TABLES CONTAINED IN APPENDIX

A.—METALS.

1.—Iron :

(1) World Production, 1913-1935	194
(2) Lodes of Iron Ore.	195
(a) According to a German Compilation of 1913	195
(b) According to an American Estimate	195
(3) Production of Iron Ores by Countries, 1913-1935	196
(4) Production of Pig Iron and Raw Steel by Countries, 1913-1934	196
(5) Iron in International Commerce, 1929-1933	197
(6) International Trade in Iron Ore and Pig Iron, 1929-1934	197
(7) Prices	198
(8) German Consumption of Pig Iron, 1913-1934	199
(9) Production in the U.S.S.R., 1913-1935	199
(10) Development of Heavy Industries in Western Europe	199
(a) Production of Coal and Coke, 1913-1934	199
(b) Production of Iron Ore, Pig Iron and Raw Steel, 1913-1934	200
General Note to the Statistical Tables on Iron	200

2.—Aluminium :

(1) Production of Bauxite	201
(2) Production of Aluminium Metal, 1913-1935	201
(3) International Commerce in Aluminium (Exports Only)	201
(4) Prices	202

2a.—Barium Minerals, Production, 1928-1935 202

3.—Chromium, Production of Chrome Ore, 1928-1935 202

4.—Copper :

(1) Production of Copper Ores, 1913-1935	203
(2) Production of Copper, 1913-1935	203
(3) International Commerce, 1929-1935	204
(4) International Trade in Raw Copper according to Countries, 1932 and 1934	204
(5) Stocks and Prices of Copper, 1925-1936	204

5.—Gold and Silver :

(1) World Production and Price of Gold and Silver, 1928-1935	205
(2) Production of Gold by Countries, 1929-1935	205
(3) Production of Silver by Countries, 1929-1935	206
(4) Silver : Stocks, 1925-1935	206
(5) Stocks of Gold, 1913-1935	207
(6) Production of Gold during the Post-War Period (1913-1925)	207

6.—Lead :

(1) Production of Lead Ores in the World, by Countries	207
(a) Lead Content of Ores Mined in the World, 1913-1935	207
(b) Lead Content of Ores Mined, by Countries, 1929-1935	207
(2) Production of Lead, 1929-1935	208
(3) Lead in International Commerce, 1929-1935	208
(4) Stocks and Prices, 1913-1936	208
(5) Scrap Lead Production in Germany, 1928-1933	208
(6) Lead : Balance Sheet of Some "Have-Not" Nations, 1928-1935	209

7.—Manganese :

- (1) Production of Manganese Ore, by Countries, 1929-1935 209
 (2) Manganese Ore in International Trade, Total Exports,
 1929-1934 209

8.—Nickel :

- (1) Production, 1929-1935 210
 (2) Prices, 1930-1936 210

9.—Quicksilver (Mercury) : Production, 1929-1935 210

10.—Tin :

- (1) Production of Tin Ores, Reduced to Tin Content of Ores
 Produced, by Countries, 1913-1935 210
 (2) Production of Tin, by Countries, 1913-1935 211
 (3) Foreign Trade in Tin Ores and Tin Metal, 1929-1935 211
 (4) Foreign Trade in Tin in Certain Countries, 1913-1935 211
 (5) Stocks of Tin on World Market, 1925-1936 212
 (6) Prices of Tin, 1913-1936 212

11.—Zinc (Spelter) :

- (1) Production of Zinc Ores, Metal Content of Ores Produced,
 by Countries, 1913-1935 212
 (2) Production of Zinc Metal, by Countries, 1913-1935 213
 (3) World Exports, 1929-1935 214
 (4) Stocks and Prices, 1913-1935 214

12.—Metals of the Platinum Group, Production, 1928-1934 214

13.—Minor Metals :

- A.—Antimony : Production, Metal Content of Ores 215
 B.—Bismuth :
 (1) Production, Bismuth Ore 215
 (2) Production, Bismuth Content of Ores, or Metal, in
 Addition to Table (1) 215
 C.—Cadmium : Production 216
 D.—Cobalt : Production 216
 E.—Molybdenum : Production 216
 F.—Radium : Production ; Radium Content of Compounds
 Produced 216
 G.—Strontium : Production 216
 H.—Thorium : Production of Monazite 217
 I.—Titanium : Production of Titanium Minerals 217
 J.—Tungsten (Wolfram) : Production 217
 K.—Uranium Minerals : Production 217
 L.—Vanadium : Production of Ores 217

B.—NON-METALLIC MINERALS.

1.—Coal :

- (1) Geological Stocks Down to 6,600 Feet : 218
 (a) Estimate of the XIIth International Geological
 Congress, Toronto, 1913 218
 (b) American Estimate 218
 (2) Production, by Countries, 1913-1935 219
 (3) World Production of Coal, 1909-1935 219
 (4) Prices, 1913-1936 219
 (5) Exports, World, 1929-1935 220
 (6) Exports and Imports, by Countries, 1934 220

2.—Oil :

(1) Geological Stocks	220
(a) Estimate by V. R. Garfias, 1933	220
(b) Estimate of the American Petroleum Institute	221
(2) Production of Oil	221
(a) World Production of Oil, 1913-1935	221
(b) Production in Important Countries, 1913-1934	221
(3) World Exports, 1929-1935	222
(4) International Trade, by Countries, 1934	222
(5) Stocks of Petroleum and Processed Products in Hands of Producers in U.S., 1925-1936	223
(6) Prices, 1913-1936	224

3.—Asbestos : Production	224

4.—Salt : Production, 1933	224

5.—Mineral Fertilizers	225

(1) Production, 1928 and 1934	225
(2) Production of Natural Nitrates in Chile, Nitrate of Soda, 1928-1935	225
(3) Production of Guano, 1913-1934	226
(4) World Exports of Some Mineral Fertilizers, Quantities, 1929-1935	226
(5) Prices, 1913-1936	226

6.—Sulphur :

(1) Production of Brimstone and of Sulphur in Pyrites	226
(2) Sulphur Balance-sheet of the "Have-Not" Powers	227

7.—Minor Non-Metallic Minerals, Production : Graphite, Mica, Silicious Earth (<i>Diatomeae</i> Earth)	227

C.—VEGETABLE AND ANIMAL RAW MATERIALS.

1.—Grains (Cereals), including Wheat Flour and Rice :

(1) Production of Cereals in Important Countries	228
(a) Wheat, 1913-1935	228
(b) Rye, 1913-1935	229
(c) Maize, 1913-1935	230
(d) World Production of Rice, 1909-1935	231
(e) World Harvest in Grains, 1933, by Continents	231
(2) International Trade in Grains	231
(a) World Exports of Grains, 1929-1933	231
(b) World Trade in Grains and Flour, 1913-1935, by Countries	232
(c) Foreign Trade in Rice, 1927-1935, by Countries	233
(d) Japanese Balance-sheet of Foreign Trade in Rice, 1927-1935	233
(3) Prices	234
(a) Prices of Wheat, 1913-1936	234
(b) Prices of Wheat Flour, 1930-1936	254
(c) Prices of Other Grains, 1913-1936	234
(d) Prices of Rice, 1913-1936	234
(4) Visible Stocks of Grains, 1925-1935	235

	PAGE
2.—Sugar :	
(1) Production of Sugar Cane, by Countries, 1925-1935 . . .	235
(2) Production of Sugar Beet, by Countries, 1928-1935 . . .	236
(3) Production of Sugar, by Countries, 1913-14, 1934-35, 1935-36 . . .	236
(4) Total World Production of Sugar, 1912-13 to 1935-36 . . .	237
(5) International Trade in Sugar, Raw and Refined, by Countries, 1929-1935 . . .	237
(6) Total International Trade in Sugar, 1929-1934 . . .	237
(7) Stocks, 1927-1936 . . .	237
(8) Net Sugar Exports of Certain Countries, 1931-1934 . . .	238
(9) Prices, 1913-1935 . . .	238
(10) Home Consumption in Certain Countries, 1913-14 to 1934-35 . . .	238
3.—Rubber :	
(1) World Production, Stocks and Prices, 1913-1936 . . .	238
(2) Movement of Stocks during Stevenson Scheme . . .	239
(3) Production in Certain Countries, 1913-1935 . . .	239
(3a) Production (Shipments) of Certain Countries, 1920, 1925, 1934 . . .	239
(3b) Plantation and Wild Rubber Production, 1913-1935 . . .	239
(4) International Trade: World Exports of Rubber, Gutta-percha and Balata, 1929-1933 . . .	240
(5) Net Imports of Certain Countries, 1934 . . .	240
4.—Timber (Lumber) :	
(1) Foreign Trade, by Countries, 1929-1934 . . .	240
(2) Summary of Foreign Trade in Timber, 1929-1934 . . .	244
5.—Wood Pulp, Production, 1925 and 1933, by Countries . . .	
6.—Oil Seeds, arranged Alphabetically :	
(1) Copra . . .	245
(a) Production, 1922-1935 . . .	245
(b) Prices, 1923-1935 . . .	245
(2) Cotton-Seed . . .	246
(a) Production, 1923-1935 . . .	246
(b) Prices, 1927-1935 . . .	246
(3) Ground-nuts . . .	247
(a) Production, 1922-1935 . . .	247
(b) Prices, 1923-1935 . . .	247
(4) Hempseed . . .	247
(a) Production, 1921-1934 . . .	247
(b) Prices, 1923-1935 . . .	248
(5) Linseed . . .	248
(a) Production, 1921-1935 . . .	248
(b) Prices, 1922-1935 . . .	248
(6) Olive Oil, Production, 1909-1933 . . .	248
(7) Palm Oil and Palm Kernel Oil, Raw ; Net Exportation of Producing Countries, 1909-1933 . . .	248
(8) Rape-Seed . . .	249
(a) Production, 1921-1935 . . .	249
(b) Prices, 1922-1935 . . .	249

	PAGE
(9) Sesamum	249
(a) Production, 1922-1935	249
(b) Prices, 1927-1935	249
(10) Soya Beans	250
(a) Production, 1922-1934	250
(b) Prices, 1923-1935	250
(11) Whale Oil, Production, 1920-21 to 1934-35	250
7.—Cotton :	
(1) Production : World Harvests of Cotton	250
(a) In million quintals	250
(b) Percentages of whole world harvest	250
(2) Exports	251
(a) Exports from Certain Countries, Raw Cotton, including Linters, 1913-1935	251
(b) Whole Volume of World Exports of Raw Cotton, 1929-1935	251
(3) Consumption :	
(a) In million bales	251
(b) In 1,000 metric tons	252
(4) Stocks, 1925-1936	252
(5) Cotton Spindles in Certain Important Countries and in the World, 1913-1935	252
(5a) Cotton Looms, excluding those Driven by Hand, 1913-1933	253
(6) Prices, 1913-1936	253
(7) Cotton in Russia, 1913-1934	253
(8) Production of Ginned Cotton, by Countries, 1925-1929	254
8.—Minor Textile Fibres :	
A.—Flax	254
(1) Production, 1929-1935	254
(2) Quantities in International Trade, 1929-1935	254
(3) Prices, 1913-1936	254
B.—Hemp	255
(1) Production of Hemp in Certain Countries, 1925-1935	255
(2) International Trade ; Exports of European Hemp, 1929-1935	255
(3) Prices, 1913-1936	255
C.—Silk	255
(1) Production of Cocoons, 1929-1935	255
(2) Production of Raw Silk, 1929-1935	256
(3) Stocks and Prices, 1925-1936	256
(4) International Trade	256
(a) Value of All Exports, 1929-1935	256
(b) Quantities, 1929-1935	256
D.—Jute	256
(1) Production, 1913-1934	256
(2) Exports from India, 1913-1934	256
(3) Exports in International Trade, All Countries, 1929-1935	257
(4) Prices, 1913-1936	257

9.—Wool :

(1) Production, by Countries, 1928-1935	257
(2) Stocks, 1928-1936	258
(3) Prices, 1913-1936	258
(3a) World Production, 1909-1935	258
(4) World Exports, 1929-1935	258
(5) Exports, by Countries, 1931-1935	258
(6) Production of Woollen Goods, by Countries	259

10.—Rayon (Artificial Silk) :

(1) World Production, 1892-1935	259
(2) Production by Countries, 1929-1935	260
(3) Prices, 1913-1936	260
(4) Exports of Rayon and Rayon Yarns	260
(a) World Exports, 1929-1935	260
(b) By Countries, 1931-1935	260

D.—ELECTRICAL ENERGY.

(1) Production, 1925, by Countries	261
(2) Developed Water Power of the World, 1932, by Countries	262

E.—TABLE OF MARKS OF INTERNATIONAL WEALTH IN RAW MATERIALS

1.—Unweighted Marks.	262
2.—Weighting Indexes.	262
3.—Weighted Marks	264

F.—SUPPLEMENTARY TABLES.

(1) Potatoes	266
(a) Production, 1921-1935	266
(b) Prices, 1926-1935	266
(2) Production of Graphite, Asphalt and Natural Gas in the "Have-Not" Countries, 1928-1935	266
(a) Germany	266
(b) Italy	266
(c) Japan	266

LIST OF GRAPHS

1.—Unweighted and Weighted Marks for 15 Countries, according to their Wealth in Raw Materials	102
2.—Index Figures of Wealth in Raw Materials	103
3.—Influence of Overhead Charges on Survival of Competing Firms in Different Countries	121

REFERENCES AND SOURCES

1. ANGELL, N. *This Have and Have-Not Business*; London, 1936.
2. ANGELL, N. *The Great Illusion*, 1933; New York, 1933.
3. ANSTEY, V. *The Economic Development of India*; 3rd edition; London, 1936.
4. BARNES, L. *The Future of Colonies*; London, 1936.
5. BASTABLE, C. F. (Ed. T. E. Gregory). *The Commerce of Nations*; 10th edition; London, 1927.
6. BEER, G. L. *The Old Colonial System, 1660-1754* (Part I; 2 vols.); New York, 1914.
7. BIRCH, L. *The Demand for Colonies*; London, 1936.
8. BRADLEY, Ph. *Can We Stay Out of War?* New York, 1936.
- 8a. CROWTHER, S. (editor). *A Basis for Stability*; Boston, 1932.
9. DAS, R. K. *The Industrial Efficiency of India*; London, 1930.
- 9a. DAVENPORT, E. H., and COOKE, S. R. *The Oil-Trusts and Anglo-American Relations*; New York, 1924.
10. *Der Welthandel in wichtigen Nahrungsmitteln und Rohstoffen vor und nach dem Kriege*; Berlin, 1926.
11. *Die Wirtschaft des Auslandes 1900-1927*; Berlin, 1928.
12. EDGEWORTH, F. Y. *Papers Relating to Political Economy*, Vol. III; London, 1925.
13. EMENY, B. *The Strategy of Raw Materials*; New York, 1936.
14. *Encyclopedia Britannica*; 14th edition; 24 vols.; London, 1936.
15. *Encyclopedia of the Social Sciences* (Ed. E. R. SELIGMAN and A. JOHNSON); 15 vols.; New York, 1930-1935.
16. GREAVES, H. R. G. *Raw Materials and International Control*; London, 1936.
17. *Handwörterbuch der Naturwissenschaften*; 10 vols.; Jena, 1912-1915.
18. *Handwörterbuch der Staatswissenschaften*; 4th edition; 9 vols.; Jena, 1923-1929.
19. HOGBen, L. *The Retreat from Reason*; London, 1936.
20. JOHNSON, C. S., EMBREE, E. R., and ALEXANDER, W. W. *The Collapse of Cotton Tenancy*; Chapel Hill, N.C., 1935.
21. KILLOUGH, H. W., and KILLOUGH, L. B. *Raw Materials of Industrialism*; New York, 1929.
22. KUCZYNSKI, R. R. *Population Movements*; Oxford, 1936.
23. *Landlexikon* (Ed. K. ZU PUTLITZ and L. MEYER); 6 vols.; Stuttgart, 1911-1914.
- 23a. LAWRENCE, J. C. *The World's Struggle with Rubber*; London, 1931.
24. *League of Nations*: "Statistical Year Book"; Geneva, 1926-1936.
25. *League of Nations*: "World Economic Survey"; Geneva, 1933, 1934.
26. LIPPINCOTT, I. *Economic Resources and Industries of the World*; New York, 1929.
27. McDOUGALL, F. L. *Sheltered Markets*; London, 1925.
- 27a. MOHR, A. *The Oil War*; New York, 1926.

28. PALGRAVE. *Dictionary of Political Economy*; new edition, ed. H. HIGGS; 3 vols.; London, 1926.
29. PHILLIPS, P. D. and WOOD, G. L. (editors). *The Peopling of Australia*; Melbourne, 1928.
- 29a. PLUMMER, A. *Raw Materials or War Materials?* London, 1937.
30. *Raw Materials and Colonies* (The Royal Institute of International Affairs); London, 1936.
31. REICHWEIN, A. *Die Rohstoffwirtschaft der Erde*; Jena, 1928.
32. RICHARDSON, J. H. *British Economic Foreign Policy*; New York, 1936.
33. ROBBINS, L. *An Essay on the Nature and Significance of Economic Science*; 2nd edition; London, 1935.
34. ROWE, J. W. F. *Markets and Men*; Cambridge, 1936.
- 34a. SARGENT, A. J. *Coal in International Trade*; London, 1922.
35. *Statistical Abstract for the Several British Overseas Dominions* (later: "... for the British Empire"); London, 1927 *et seq.*
36. *Statistical Abstract for British India*; London, 1926 *et seq.*
37. *Statistical Abstract for the United Kingdom*; London, 1926 *et seq.*
38. *Statistical Abstract of the United States*; Washington, D.C.; 1926 *et seq.*
39. *Statistisches Handbuch der Weltwirtschaft*; Berlin, 1936.
40. *Statistisches Jahrbuch für das Deutsche Reich*; Berlin, 1915-1936.
41. *The Cotton Yearbook*; Bradford and London, 1935.
42. *The Mineral Industries of the British Empire and Foreign Countries*; London, 1931 *et seq.*
43. *The Wheat Situation, 1931* (20th Report of the Imperial Economic Committee); London, 1932.
44. *Vierteljahrshefte zur Konjunkturforschung*; Berlin, 1926 *et seq.*
45. WALLACE, B. B., and EDMISTER, L. R. *International Control of Raw Materials*; Washington, D.C., 1930.
46. WOOFER, JR., T. J. *Landlord and Tenant on the Cotton Plantation*; Washington, D.C., 1936.
47. ZIMMERMANN, E. W. *World Resources and Industries*; New York, 1929.

PREFACE

THE purpose of this study is to clear up the facts of an economic problem which are intricate and numerous, though they do not offer particular intellectual difficulties, and to marshal the practical implications of the incongruity of facts with interests and ambitions.

In the course of this study a number of red herrings was found to have been drawn across the trail of truth ; these were followed and shown up for what they are ; then the hunt returned to the genuine trail.

Opinions on the subject are widely at variance. Authors have written many books on the subject, and the number of articles and speeches reported in the daily and periodical Press, etc., is very large. The books have been mentioned, as far as they seem to me to deserve serious study, in the list of references and sources ; but that does not mean that I consider all of them, indiscriminately, as apt reading matter.

I did not find it propitious, after having explained what seems to me to be the truth, to refute other authors who think differently.

The need for brevity forced me to neglect some aspects of the subject. For instance, the position of the Small Powers is scarcely discussed in this essay. But the most sympathetic treatment would have been unable to change the sad truth that they will be victims, not masters, of future developments. There are, it is true, some minor problems in regard to raw materials which they might be able to solve by activities of their own : perhaps only provisionally, but with some alleviation of their present situation. By such action they might give a useful example of what can be done in international matters by good-will and readiness to act with sweet reasonableness ; but as I cannot see the slightest traces of such a spirit in them (any more than in the Great Powers) I thought it useless to give much space to a detailed discussion of their positions.

To save space I have left out raw materials which may not be without importance. I have excluded, *e.g.*, leather (a material whose production is widespread and which has many substitutes), tanning materials (now largely superseded by chromium compounds, which are included in my treatment of chromium), iodine (which can be produced, at a pinch, nearly everywhere in the small quantities that are of vital importance), and camphor (for which a satisfactory substitute from coal-tar exists). The only commodity that I should have liked to include, but which I have omitted, is castor oil. It is important not because it was used on a large scale in the civil war in Italy to torture the "enemy," but because it is the best lubricant of quickly-rotating machinery, particularly aeroplane motors; but I was unable to find any reliable source for the facts necessary for a discussion of this commodity.

The figures, although they are not equalled in existing literature in completeness and up-to-dateness, are sadly inadequate. That is not my fault; the sources do not give us all that we need. I have tried to avoid lengthy discussions on points of statistical method; the few exceptions will, I hope, find their explanation in the importance of the conclusions which could be reached only in this way. Part of this study, particularly the first chapter and the Appendix of statistical tables, were finished in manuscript before most of the figures for 1934 and 1935 appeared. I have included those which seemed important when they recently became available, and have modified the text where the new figures seemed to require it. But as I did not intend to make a statistical handbook, and as in any case the figures will no longer be quite up to date a year or so hence, I have left it at that. The chief object was to get the figures as complete as possible for the particular period under consideration, *i.e.*, the business cycle 1928/1929 to 1934/1935/1936. That time is a potent factor in changing facts has been shown in the text explicitly and clearly.

What is the possible use of such a study? To influence politicians and statesmen? I hope they read books, though I sometimes think that they do not read many. The impact of reason has become very small nowadays. To show, *e.g.*, the objective futility of the endeavours to get access to more raw

materials by conquest is one thing ; to show that, though this is an irrational thing, it is a potent factor in modern politics, is a second thing ; to recommend better means of attaining the same end is a third thing ; and to estimate the chances of the reasonable thing being done, against advice inspired by jealousy and the desire for prestige, or by the hankering of orators for spectacular formulas and a gushing phraseology, is a fourth, and again a quite different, thing.

So I fear that this study will have to look for its public elsewhere : to the few politicians who want to know what they and the others are speaking about, to the educated layman and journalist, and to those many people in the middle and the working class who seriously want to instruct themselves in a matter which is attracting the spotlights in so spectacular a way. I think particularly of my many friends in the Workers' Educational Association, in the Fabian Society, in some Trade Unions and Co-operative Guilds with whom for nearly three years I had the pleasure of studying the economic questions of the day.

In the meantime the enquiry of the League of Nations, proposed in the autumn of 1935 by the then Foreign Minister of Great Britain, Sir Samuel HOARE, has begun. The League has appointed a committee for the study of the raw materials problem. The first meeting was on March 8th, 1937, Mr. W. STUCKI (Switzerland) being in the chair. Non-members of the League were represented by Mr. Y. SHUDO for Japan and Mr. H. F. GRADY for the U.S. Germany and, among the members of the League, Italy were not represented. The British delegate, Sir Frederick LEITH-ROSS, declared that the raw materials problem cannot be solved by the transfer of territory (so far, so good), that the open-door policy would sometimes be harmful to the colonies themselves (but the open-door policy and preference for the Mother Country are not the only possibilities !), etc., etc. In short, he seems in a particularly encouraging way to have said that nothing can be done. Similarly with others. A not very hopeful beginning. But perhaps this only meant that the speakers were clearing their throats, and that sweet advice will come later. Let us hope that the future meetings of the committee will endeavour more

seriously to find out what can be done, why and how it can be done, and to show that it should be done !

The book by Mr. Plummer, I am sorry to say, came too late into my hands to be taken into consideration ; the only thing I could do was to include its title in the list of references and sources.

April 5th, 1937.

Now I am reading the proofs I cannot find that the result of the deliberations of the committee of the League of Nations has contributed anything new to the subject. But I have seen what Mrs. Vera Anstey, D.Sc. (Econ.), our dear friend, has done for the book when she undertook to supervise the smoothing-out of the numerous germanisms of my manuscript. I hope she feels the deep gratitude which I feel for this, as for so many acts of friendship and kindness of hers.

HERMAN KRANOLD.

Talladega College,
Talladega, Ala., U.S.A.

November 5th, 1937.

THE
INTERNATIONAL DISTRIBUTION
OF RAW MATERIALS

CHAPTER I

REVIEW OF INTERNATIONALLY INTERESTING RAW MATERIALS

RAW materials are all things which are either consumed in the form in which nature offers them to us, or are processed into a shape and size which enables them to serve the purposes of consumption. Not only material things are raw materials in an economic sense. The economic term comprises services also : the services which the inorganic forces of nature are able to offer us : heat, electricity, the energy of falling water or of moving air, and the services of living things.

These services are multiple. Leguminous plants (peas, beans, etc.), *e.g.*, offer them by accumulating nitrogenous compounds in the soil. Some trees protect the soil on which they grow against erosion and drought. Animals offer them when they are domesticated, like horses, cattle, donkeys, mules ; sometimes even if not domesticated, like those useful beasts of prey introduced into a district to get rid of an invasion of rabbits, or like insects parasitic on destructive insects, which serve merely by living. The most useful economic service is, of course, given to mankind by its own labour.

But not all these materials and services are interesting from the viewpoint of the international distribution of productive resources. We need not compile an encyclopedia of them ; we may pick out those which interest us in connection with our subject. We will treat them directly, case by case, and discuss later the important question whether we have chosen all those which are relevant to our inquiry.

Our work has to be done with the help of statistical figures, as accurate and complete as can be obtained. Again we do not endeavour to have a whole and complete encyclopedia of statistical data as to these goods and services, but only to give what is useful for the purposes of our study. As to dates, we

2 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

limit ourselves to pertinent data, generally those covering the last full business cycle (roughly 1928 to 1936), in so far as they are available, and add figures for earlier years only where it seems relevant for our conclusions.¹

A.—METALS.

I.—*Iron.*

Iron is the most important of the metals. We are probably living in an age in which the use of iron in its pure form becomes rarer and rarer. The Stone Age, the Age of Brass and the Iron Age will, in all probability, be followed by a period which may be called AAAC, the Age of Alloys and Artificial Compounds, and the young members of the present generation may expect to live into a period when the use of a bar of iron will be just as obsolete, technically, as the use of stone is now for making a knife. The transformation of some vegetable materials (such as the protein of milk, the cellulose substance of wood, the components of that complicated compound which we call "coal," and the basic substances of the soya bean and many others) into new chemical compounds, and the admixture of the light metals, especially aluminium, and of some of the other metals, like vanadium, with iron will complete a development which, with the production of artificial stone from cement and of artificial fibre from wood, has already made enormous headway during the last two score of years. But even then iron will remain what it is now: the backbone of all uses of metal. An increasing variety of iron alloys and steels may well mean not a decrease, but a further vast increase of the technical, and therefore economic, significance of iron.

The quantities of iron and steel produced at the top of the last boom, in 1929, viz., 99 million tons of pig iron and 111 million tons of steel, show increases of 68 and 175 per cent. over 1913. There are some other raw materials the production and consumption of which grew still more rapidly, but even if we take into account that the year 1929 was wholly exceptional, the increase remains large, particularly if compared with the much slower increase of mankind during the same period.

¹ For similar reasons we do not attempt to give numbers complete to the last unit, but content ourselves with "round figures".

From a table printed by Mr. H. W. Killough and Mrs. L. B. Killough (p. 231) I quote the following figures for the production of iron and steel :

TABLE Ti.
PRODUCTION OF IRON AND STEEL, 1800-1921.

				In thousands of Metric Tons.	
				Pig Iron.	Steel.
1800	...	...	...	825	?
1870	...	...	...	11,900	692
1900	...	...	...	38,973	28,273
1914	...	...	...	59,337	59,800
1921	...	...	...	35,415	40,491

Further figures can be found in the Appendix. The deep drop of 1921 soon gave way to a new tremendous increase, and so did the slump of 1932. Steel^{1a} overtook iron in 1914, and never again declined to second place, even during the post-war slump.

The sources from which iron is obtained for the production of pig iron are ores and, to a small extent, scrap metal. The sources from which iron is obtained for steel-making are iron

^{1a} For steel the corresponding figures were, for four significant years, as follows, in million metric tons :

1880	1900	1926	1935
4.27	28.34	91.23	99

If we disregard the abnormal peak of 1928/29 and the equally abnormal low figure of 51 million in 1932, we get, by assuming a further increase of 8 million tons every 9 years, the following forecast :

1926	1935	1944	1953
91	99	107	115

An extrapolation according to the curve of the actual increase from 1880 to 1935 would lead almost to a standstill in production.

TABLE Tia.—ANNUAL AVERAGE INCREASE OF STEEL PRODUCTION.

Years.	Mill. Tons.	Increase or Decrease Compared with Previous Period (in per cent.)
1880/1900	1.2	
1900/1926	2.4	+ 100
1926/1935	.9	- 63
And hypothetically for 1935/53	.333	- 63

or a production in 1953 of $99 + 18 \times .333 = 105$ million tons only. But I think that this is entirely improbable, and that the other forecast approaches more nearly to what will happen.—At the moment of reading the proofs (September, 1937) reports seem even to show that the present production of steel has by far overtaken the larger estimate.

ores, pig iron, iron alloys and scrap metals, the last to a rather important extent. The actual ultimate consumption of iron comprises the whole quantity of steel produced; but it is difficult to discover how much iron metal is ultimately consumed in other forms than steel. We would have to deduct from the pig iron produced that part which is processed into steel. We know the quantity of steel, and how much metal it contains (*viz.*, about 98 per cent.); but we do not know how much non-iron metal is contained in it,² nor do we know even approximately how much of the iron in the steel comes from scrap, because this information is supplied by very few countries.

The increase in the world's production from 1913 to 1929 was: in iron ore 15 per cent. (the increase or decrease of iron metal content being unknown); increase in pig iron produced 25 per cent., in steel produced 40 per cent. But what about the quantities of scrap metal used?

Mr. E. W. Zimmermann mentions in his book (p. 775, *note*) that for every pound obtained from ores of the following metals marketed (presumably in the U.S.), the following fractions of a pound produced from scrap material ("secondary metal," "salvaged material," etc.) were marketed also:

TABLE T2.
SCRAP METAL MARKETED IN THE U.S.^{2a}

				Pound Scrap.
Aluminium	...	...	...	'41
Antimony	...	...	...	'44
Copper	...	...	...	'53
Lead	...	...	...	'30
Nickel	...	...	...	'12
Tin	...	...	...	'38
Zinc	...	...	...	'23

¹ The admixtures with manganese vary from 5 to 40 per cent., with chromium from 2 to 15 per cent., whilst other, much smaller, percentages apply to vanadium and molybden, and others again to aluminium in aluminium steels.

^{2a} Another collection of facts as to the recovery ("salvage") of metals in the U.S. is given in the following table:

TABLE T2a.—METALS RECOVERED IN THE U.S.

	Unit.	1928	1929.	1930.	1933.	1934.	1935.
Aluminium	1,000 long tons				29.9	41.4	45.9
Antimony	" " "				6.6	6.7	8.6
Nickel	" " "				1.5	1.7	1.8
Platinum	1,000 troy ounces				35.1	35.5	47.1
Palladium	" " "				4.8	5.6	7.9
Iridium	" " "				.7	1.3	2.2
Other platinum metals	" " "				.8	1.3	2
Tin	1,000 long tons	32	30.6	23.4	19.7	22.2	24.9

The percentage of scrap metal among the whole quantity produced varies, then, in these cases between 11 and 35 per cent. As to iron, Mr. Zimmermann quotes for the U.S. that in 1929, at the top of the boom, 22.6 million tons of scrap entered into the production of 54.9 million tons of steel, which works out at a proportion of 41 per cent. of the steel produced, or probably nearly 50 per cent. of the iron metal contained in it.

Mr. Zimmermann adopts the following ingenious method of estimating the world increase in the use of scrap iron. He compares :

1913 :	World production of pig iron ...	78 million tons		
	" " " steel ...	75	"	"
	(Surplus of iron over steel 3 million tons.)			
1929 :	World production of pig iron ...	96.4 million tons		
	" " " steel ...	118	"	"
	(Surplus of steel over iron 21.6 million tons.)			

In the U.S. 25 per cent. of the pig iron produced is not transformed into steel. If this percentage is applied to the world figures, we get :

Steel produced	118 million tons
From pig iron (75% of 96.4)	72.3 " "
From other sources	45.7 " "

On this basis Mr. Zimmermann assumes a scrap contribution to the world's requirements of iron in 1929 of no less than 37 million tons or about one-third of the steel produced. There are some weak points in this argument, such as the application of the percentage of pig iron not entering into steel production in the U.S. to the whole world. But there are reasons to assume that, even if many countries use less scrap in relation to pig iron than the U.S., the large steel-making countries in Europe (Germany, France, Great Britain) probably use the last bit of scrap available. Hence it is likely that Mr. Zimmermann has understated rather than overstated the importance of scrap iron.

6 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

As a further illustration I give a few figures on Germany. In making pig iron Germany :

TABLE T3.
CONSUMPTION OF SCRAP IRON IN GERMANY, 1929-1934.

	Produced Million Tons.	Consumed Million Tons. Scrap Iron.	Per Cent.
A. Production of pig iron :			
1929	13.2	.7	5.3
1932	3.9	.17	4.4
1933	5.2	.26	5
1934	8.7	.47	5.4
B. Steel production :			
1929	16.1	7.84	48.7
1932	5.7	3.32	58.2
1933	7.5	4.16	55.5
1934	11.7	6.16	52.7

Unfortunately figures for 1935 have not yet been published. A comparison of prices gives us (in RM. per metric ton) :

TABLE T4.
PRICES FOR STEEL AND SCRAP, 1913-1936.

	1913.	1929.	1932.	1936, July.
Heavy steel scrap, N. England ...	55.12	64.57	26.24	35.36
Steel bars, round, $\frac{1}{2}$ -in. ...	163.43	160.03	96.30	115.0
Scrap price in % of steel price ...	33.6	40.3	28.3	30.8

This shows the following features :

- (1) With the slump the percentage of scrap used in making pig iron decreased, that used in making steel increased; recovery reversed that process.
- (2) The boom increased the fraction characterizing the proportion of the scrap iron price to steel price, the slump decreased it, recovery made it increase again.
- (3) The use of record quantities of scrap at the top of the boom came about in spite of the fact that scrap material was very expensive at that time in terms of steel.

For the U.S. one more addition seems worth while, *i.e.*, more than 50 per cent. of the exports of heavy iron and steel products

consists, in recent years, of scrap, as the following figures show :

TABLE T5.
SCRAP IRON IN EXPORTS FROM U.S., 1923-1934.

	1923.	1926.	1931.	1932.	1933.	1934.
Quantity in 1,000 long tons :						
All sorts	2,010	2,167	969	595	1,341	2,813
Scrap	66	105	136	227	773	1,835
Value in million \$:						
All sorts	167	174	63	29	46	89
Scrap	1	2	2	2	7	19
Value in \$ per ton of scrap ...	15.15	19.05	14.71	8.81	9.06	10.35

It is very interesting to observe this sudden increase of the exportation of scrap iron and steel during the second half of the depression and during the recovery period.

The German Statistical Abstract for 1936 gives the following figures :

TABLE T6.
WORLD EXPORTS OF SCRAP IRON, 1929-1935.

	1929.	1930.	1931.	1932.	1933.	1934.	1935.
Quantity—							
in 1,000 tons ...	2,976	2,178	1,741	1,632	2,721	3,986	4,285
value, in million RM.	180	117	69	45	75	109	121
price, RM. per ton	61	54	40	28	28	27	28

These figures again show that the slump was very deep, and there was no recovery at all in prices. This makes the enormous increase in quantity during the first three years of the recovery period only the more striking.

Thus we may say, without danger of making a serious mistake, that the use of scrap iron as a source of iron metal in making steel is increasing with great speed, that the rate of increase of scrap consumed is greater than that of iron ores, and that in the not remote future the total quantity of iron produced from scrap is likely to exceed that produced from ores year by year. This much increased use of the scrap materials is a distinct sign of the increased technicality of our metallurgical methods.

All this brings us immediately to an important conclusion : as technique develops, less and less of the iron and steel produced originates from newly-mined ore. Iron is a relatively non-perishable material,³ and the situation with iron, therefore, approaches similarity with the situation as to gold. There the quantity disappearing " for good " year by year is a very small proportion of the whole annual production,⁴ so that the world's stock of available gold increases every year by something like 90 per cent. of the gold actually mined. As to our present subject, iron, this means : as technique develops every country depends, for its requirements of new iron and steel, less and less on newly-mined iron ores and can rely more and more on the scrap iron originating from its obsolescent former investments.

The obvious outcome of this is : (1) the production of iron ores within the home country becomes quickly less vital for a nation ; (2) the future of the " national " character of a country's iron production comes to depend more and more on the rate of its present investment in iron and on the velocity of obsolescence of these investments.

It was necessary to establish this truth first of all and to drive it home. All the forthcoming statements and reflexions on the inequality of the nations in regard to the distribution of the world's resources of iron ores must be looked at in the light of this truth. It shows us that all the inequalities which we shall presumably find are bound to become less important during the next twenty years or so.

This is the more significant since Table A1 (2) (a) shows us that nature has indeed treated the several parts of the world

³ I venture to ask the reader to remember this in connection with quite a number of other metals also. Things must be analogous with many of them, though we do not always know enough to show this statistically, as we are fortunately able to do with iron.

⁴ The industrial use of gold is sometimes estimated to absorb something like a third of the annual production. But this does not mean that this gold disappears. Most ornamental gold is " frozen down " for a time, but may reappear. Much of the gold exported from India during the slump was melted " scrap " gold from jewels. Even the dead are not always buried with their golden teeth. . . . If we assume that 10 per cent. of the annual production disappears " for good ", this is probably too generous an estimate.

in a very unequal way as regards providing them with resources of iron ores. If we disregard the rather uncertain figures of the last column of this table we find, with the help of column three, that of the total quantity of iron believed to have been found with practical certainty by the experts of 1913,⁵ the following percentages give us a picture of its distribution in the earth :

TABLE T7.

PERCENTAGE DISTRIBUTION OF WORLD SUPPLIES OF IRON LODES.

•					Per cent. of the World's Lodes.	
Europe	...	...	...	...	33	
Great Britain	...	...	...	7		
France	...	...	...	11		
Germany	...	...	...	2		
U.S.S.R.	...	...	...	3.5		
Asia	...	...	...	...		10
Africa	...	...	...	...		2
America	...	...	...	...		50
U.S.	...	...	...	17		
Oceania	...	...	...	...		5
					100	

Now many of these deposits are entirely, or almost entirely, unworked to-day : India and Brazil have old iron mines, just as some parts of Africa have, but nothing of great importance has been mined there so far,⁶ and Cuba, Newfoundland and Oceania, with a seventh part of the total supplies, have practically remained untouched. The quantity of iron extracted from world resources by current mining is not important quantitatively when compared with the size of the lodes known with certainty to exist. If we assume that mining were to continue at the rate averaged for the years 1925 to 1933, viz., 147 million metric tons annually, the known lodes of ores

⁵ To do justice to the uncertainty and subjectivity of such estimates we give in Table A1 (2) (b) another estimate which, however, differs in no very important way from the table discussed in the text. The most remarkable differences are those relating to France and the United States. More important seems to me the way in which the rather speculative character of such estimates emerges from these tables.

⁶ Even iron-ore mining in India is, as yet, carried on on a very small scale; though the future holds more important possibilities.

would allow this rate to be maintained for another 393 years.^{6a} But if only half the mined iron were to survive, to be used over and over again through the melting down of scrap, the world would, by that time, be incredibly full of iron. Even if a further big increase of mining takes place, there is, therefore, no prospect of a future shortage of iron—at least for the world as a whole.

Table A1 (3) shows that the existing production of iron ores and of iron and steel is very unequally distributed over the world, the dispersion, however, being very different from that of the wealth in iron ores present in the soil. The following

^{6a} We come to a similar conclusion when we inquire critically into the foundations of some pessimistic forecasts of an imminent world scarcity of iron. Mr. *Lippincott* discusses the question as to whether a comparative shortage of iron may threaten the world and develops what seems to me an undue pessimism. It is quite true that the appearance of, e.g., China and India as buyers on the iron market on a large scale might mean a great increase in world consumption. It is doubtful whether the present per-head figure for annual iron consumption in the U.S. will ever be reached by countries much more densely populated and beginning their full "development" only in an age when railways will be already old-fashioned. A rise in the consumption of iron in China and India to half the per-head level of the U.S. would, therefore, mean a very great rise over two-score years or more. If we put the per-head annual consumption of steel in China and India for the future at two-tenths of a ton this would mean an increase of .15 tons per head or annually $760,000,000 \times .15 = 114$ million tons. Assuming an iron content of 50 per cent. in these ores, the annual consumption would need to be 228 million tons. This would bring future world consumption, allowing for other increases, up to something like 500 million tons per year, so that the "certain" lodes of ore in our Table A1 (2) (a) would be sufficient for a century if consumption were to continue at such a rate and if no corrections had to be made in this computation.

But we may safely assume that investment at such a rate over a whole century or longer is very improbable and that it is not over-sanguine to expect that after a certain time 40 per cent. of the iron contained in new steel will come from scrap material. If we then assume 80 per cent. of the above figure to be the maximum probable permanent annual consumption (400 million tons of ore) and a saving of 40 per cent. of that by the use of scrap iron (Mr. *Lippincott* assumes that only 25 per cent. of the annual production of iron does not ultimately reappear; if I put 40 per cent. instead of 75 per cent. I am certainly extremely conservative), we arrive at a figure for permanent annual consumption of only 240 million tons; if we deduct a further 20 per cent. of this to allow for other metals admixed with iron in the steel alloys to be used in future (stainless steel contains 17 per cent. chromium, 2 per cent. carbon, etc.), we have to divide the "certain" lodes of 57,812 million tons by 192 million. This gives the result that world stores of iron ore should last for 301 years. As the peak in consumption will be reached only very gradually, we should be safe for 350 or 360 years—certainly a more reassuring outlook than for quite a lot of other raw materials.

I hope the reader will excuse this web of entirely hypothetical figures and calculations. I only wanted to show in an example how utterly shaky the foundations are on which some optimistic and pessimistic forecasts are based.

table shows the existing unequal dispersions under these three headings in a very striking manner :

TABLE T8.

DISPERSION OF RESOURCES AND PRODUCTION OF IRON IN PERCENTAGES.

Percentages.	Lodes of Iron Ores.	Proportion of the World's Production of Ores, 1933.	Production of Pig Iron and Raw Steel, 1934.
EUROPE	33	72	60.8
Great Britain ...	7	8.5	10.5
France	11	34	8.5
Germany	2	3	17
U.S.S.R.	3.5	16	14
AMERICA	50	20.2	30.5
U.S.	17	20	29.5

The inevitable drawback of this table is that since the proportion of pig iron reappearing in steel cannot be eliminated there is some double counting of uncertain size. Though the figures used for making the totals for Europe and America in the second and third columns of this table are not quite complete the discrepancy between them is enormous. Even countries like Italy and Japan are comparatively well off as regards the production of iron and steel, though certainly not as regards resources of iron ore.

TABLE T9.

THE WEALTH OF ITALY AND JAPAN IN IRON.

Percentages of World Totals.	Proportion of the World's Population, 1931-1932.	Production of Pig Iron and Raw Steel, 1934.
Italy	2	1.7
Japan, including Manchuria and Korea	5.5	4.2

The disadvantages of these two countries are, however, slight and bound to lose much of their significance in the light of what we found concerning the increasingly important part played by scrap iron in the provision of raw material for the heavy industries.

Another result of the inspection of our Tables A1 (2) and (3) is that the importance of the colonial territories⁷ in the provision of iron for the world's consumption is quite subordinate

⁷ We do not treat the Dominions of Newfoundland, Canada, etc., as colonies for reasons explained later in the text. The same applies to India.

12 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(only French and Spanish North Africa are exceptions to this rule which deserve to be mentioned). This is, in all probability, bound to remain so, unless quite unexpected new discoveries of iron ores in colonial territories change the whole picture fundamentally.

The production of pig iron and raw steel has varied very much from year to year, as our tables show. It has ranged after the war between the very low figures of 76 million metric tons in 1921 and 91 million in 1932 and a peak of no less than 223 million tons in 1929 (with some double counting in all of these cases, see above).

The order of precedence in the production of pig iron and raw steel among the first-class powers (the "Big Seven") is shown by Table A1 (4) to have changed in the following ways :

TABLE T10.

ORDER OF RANK IN PRODUCTION OF IRON AND STEEL, 1913-1934.

Relative Importance.	1913.	1929.	1934.
France	4	3	5
Great Britain	3	4	4
Germany	2	2	2
Italy	6	7	7
Japan	7	6	6
U.S.	1	1	1
U.S.S.R.	5 ¹	5	3

¹ Including Poland and Baltic Provinces.

The changes, in spite of all the 1919 adjustments of political territories, are on the whole not very significant. Italy and Japan, and again France and Great Britain, have exchanged places ; the U.S. and Germany still lead, though in 1934 in a less overwhelming way than in former years. Only Russia has been advancing rapidly since her great programme of industrialization. Another leap like that from 1929 to 1934 would bring her, without doubt, up to second place—a fact which has obvious military and political implications. So far the "dissatisfied" and the "satisfied" countries (if we exclude the U.S. from the comparison) have developed their aggregate production of pig iron and raw steel in the following way :

TABLE TII.

IRON INDUSTRY IN "SATISFIED" AND "DISSATISFIED" COUNTRIES,
1913-1934.

Nations.	In millions of Metric Tons.		
	1913.	1929.	1934.
"Satisfied" ...	39.3	46.4	47.5
"Dissatisfied"	43.3	40.4	32.9

This shows us a steady and total reversal of the former situation. The balance of production of the "dissatisfied" over the "satisfied" nations in 1913 was one of 4 million tons; their negative balance was one of 6 million tons in 1929, and in the midst of the new boom, in 1934, it had reached as much as 14.6 million tons! Here again the political and military implications are equally clear.^{7a}

Comprehensive, reliable figures for international commerce in iron ores, pig iron, raw steel and semi-processed goods, like tinplate, wire and rails, are—just as is the case with most other raw materials which interest us in this study—unfortunately available only for the years of the last business cycle. They show, from a very high peak in 1929, an enormous drop which reached its deepest point in almost all cases in 1932. Nineteen thirty-three brought a distinct, though in most cases modest, recovery, except for iron in bars and the mixed group "other sheet iron". Recovery was hastened in 1934 and 1935, and as far as we can judge from the figures for some countries quoted in Table A1 (6), and from other sources which need not be quoted here, this speeding-up of the international movement of iron in 1934 had a lot to do with building and armaments. This is illustrated by the figures for the importation of iron ores into Germany, Great Britain and Japan, although only Japan had regained by 1934 the level of her 1929 imports. Unfortunately, the figures in the Tables A1 (5) and (6) do not cover the same field and are therefore not strictly comparable, though the figures in Table A1 (6), column six, show that the total of world exports of iron ores in 1934 must

^{7a} The figures for 1935 have come to hand during the revision of the manuscript. The total production of the "satisfied" nations was 53.7, that of the "dissatisfied" nations 39.6 million tons, a surplus in favour of the first group of 14.1 million tons.

14 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

have been at least 32 million tons, so that this gauge of industrial recovery would read :

TABLE T12.
WORLD EXPORTS OF IRON ORE, 1932-1934.

In million Metric Tons.		
1932.	1933.	1934.
20.5	24.6	32

Table A1 (7) shows, in gold marks,⁸ that the decrease in prices of iron ore went on, even during the period of recovery, and even up to July, 1936, the date at which our table ends, on a rather impressive scale. At this latter date, though, a standstill seemed to be near at last. The same price trend is apparent up to 1935 for products of the processing of ores

⁸ One of the great difficulties in an inquiry like ours is that statistics are so much more often given in money units than in units of weight, etc. Where we could not avoid taking money figures because quantitative data in units of weight or volume were not available, we have done so generally by using, over a period of time, prices reduced to quantities of gold. The RM., a rather fictitious unit with its official rate of exchange on the old (theoretical) gold standard, as fixed after the Dawes Agreement, may quite well serve as such a defined unit of gold. The £, the \$, etc., are "off gold" now and data given in terms of them would require after 1931 and 1933 respectively to be reduced to gold pounds and gold dollars. The purchasing power of gold has, of course, changed also in the course of time, as is shown by the following example. In the official German publication, *Der Welthandel in wichtigen Nahrungsmitteln und Rohstoffen vor und nach dem Kriege*, the volume of world commerce is measured on the basis of prices, reduced to the same level of purchasing power in relation to equal quantities of gold. The several goods are weighted. So the authors arrive at a table which gives, in terms of the pre-war purchasing power of gold, the value of world trade in the following figures :

TABLE T12a.—VALUE OF WORLD TRADE IN GOLD MARKS, 1913-1924.

	1913	1922.	1923.	1924.
"Gold marks," 1,000 million ...	170	132	140	161
1913 = 100	100	78	82	95

Moreover, in this inquiry, we generally measure world trade in any commodity in the quantities and values appearing in the statistics of exporting, not importing, countries. The quantities, it is true, should be identical in both cases, if there were not differences in the completeness with which imports and exports are registered ; but the values must be different. The best detailed statistics are available for exports, but the figures for imports and exports cannot be mixed, because import money figures have a tendency to be determinately greater than export figures. Hence they cannot be used together as a measure of quantities, even if due allowance is made for price changes. Import values include, as even J. B. Say knew, transport costs, commercial profits, import duties, handling costs in ports, etc., in their

which were not protected by duties in England, like pig iron and sheet iron; but for these goods the drop in prices from 1932 to 1935 was much smaller than that for iron ores in the U.S., and in 1936 recovery of prices was distinct. The same is

estimated values at the moment of importation. We find, *e.g.*, in the German Statistical Year Book for 1936, two series of figures (from which we have calculated the third and fourth series):

TABLE T12b.—VALUE OF WORLD TRADE, 1929-1935, IN 1,000 MILLION RM.

	1929	1930.	1931.	1932.	1933.	1934.	1935.	
I.—Value of all imports in world commerce:								
a. Living animals ...	1.4	1.5	1.1	.6	.4	.4	.4	
b. Foodstuffs and beverages	35.9	29.5	23.2	16.8	13.8	12.3	12.3	
c. Raw materials and semi-processed goods	54.7	42.8	29	19.6	19	18.8	19.3	
d. Finished goods ...	55.9	46.3	33.3	20.8	18.8	18.3	18.5	
II.—Value of all exports, do.:								
a. ...	1.4	1.4	.9	.5	.4	.3	.4	
b. ...	21.6	25.7	19.5	14.2	11.8	10.8	10.9	
c. ...	47.4	35.8	24.3	16.5	16.7	16.5	17	
d. ...	55.8	45.8	32.8	20.8	18.8	18.4	18.4	
I. a-d, Totals ...	147.9	120.1	86.6	57.8	52	49.8	50.5	
II. a-d, Totals ...	136.2	108.7	77.5	52	47.7	46	46.7	
III.—Surplus of import or export (—) values, do.:								
a. ...	0	.1	.2	.1	0	.1	0	
b. ...	4.3	3.8	3.7	2.6	2	1.5	1.4	
c. ...	7.3	7	4.7	3.1	2.3	2.3	2.3	
d. ...	.1	.5	.5	0	0	—1	.1	
IV.—The same, in per cent., of exports:								
a. ...	0	7.1	22.2	20	0	33.3	0	
b. ...	13.6	14.8	18.9	18.4	16.9	13.9	12.9	
c. ...	15.4	19.5	19.3	18.8	13.7	13.9	13.5	
d. ..	.2	1.1	1.2	0	0	—5	.5	
III. Totals ...	11.7	11.4	9.1	5.8	4.3	3.8	3.8	
IV. Totals ...	8.6	10.5	11.7	11.1	9.1	8.3	8.1	

If we look through the columns of group IV we find an extremely wide range of values, from $-.5$ to $+19.5$ (even if we disregard the less important and rather unreliable figures for living animals with their extreme percentage of 33.3). We further find a maximum in 1930 or 1931 with the wide range from $+1.1$ to $+19.5$ in the first of these years, and we get then in general a decrease and a convergence, so that the series for 1929 and 1935 are not so very dissimilar, being as follows:

TABLE T12c.—DIVERGENCES IN IMPORT SURPLUSES IN WORLD TRADE, 1929-1935

	a	b	c	d	Totals.
1929 ...	0	13.6	15.4	.2	8.6
1935 ...	0	12.9	13.5	.5	8.1

Though we may assume that further approach to the peak of the coming boom may tend towards full restoration of the series which we found for 1929, the whole inquiry makes it clear that, in the intermediate period, the "natural" differences in import and export valuations were so wide that we cannot mix import and export values in attempting to measure quantities.

16 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

true for some other items in our table. The increase in prices is shown in the following table :

TABLE T13.
INCREASES IN CERTAIN IRON PRICES, 1932 TO 1936.

	Per cent. 1932 to July, 1936.
Belgium, girders	28
Belgium, iron bars	25
Great Britain, scrap iron	35

Conclusions can be based on Table A1 (8) only with great caution, for during the same period the consumption of steel has, in all probability, not decreased like that of pig iron, but increased, though unfortunately comparable figures are not available for 1913 and 1929.

Table A1 (9) shows in rather more detail the rapid increase of production in Russia. The increase from the low point of 1931 is indeed impressive, and no end may be expected of this development during the next few years, unless the Russian government, contrary to their present policy, should deliberately want to stop it—which, in view of the international political situation, is not very probable.

Tables A1 (10) (a) and (b) show the development of the heavy industries in Western Europe since 1913. In regard to Table (a) we must not forget that coal provides now much more energy per unit burnt than it did in 1913. If we increase the figures for 1929 by 10 per cent. to make up for this difference, our comparison for coal looks like this :

TABLE T14.
COAL PRODUCTION IN CERTAIN EUROPEAN COUNTRIES, 1913 AND 1929.

	1913.	1929.	In million Metric Tons. + or —	in per cent. + or —
Germany (excl. Saar) ...	141	179	+ 38	+ 27
Belgium	23	30	+ 7	+ 34
France	40	59	+ 19	+ 37·5
Great Britain	292	288	— 4	— 1·4
Holland	2	13	+ 11	+ 550
Total area	498	569	+ 71	+ 14

The position of Great Britain has, comparatively, greatly deteriorated. The explanation of this is to be found, as Table (b) shows, not only in the collapse of the export of coal for navigation purposes, but also in the very hesitating recovery in the production of pig iron. The increase in the making of steel could give to coal mining only a very imperfect compensation for this.

We shall learn the implications of the above facts only at a later stage, when we begin the discussion of our problems. But even the short exposition of the facts as shown by the statistical tables is already pregnant with rather suggestive hints.

2.—*Aluminium.*

Aluminium is one of the metals which are only just beginning to transform our life. Shortly before the war its use was quite limited; the excellent and, at that time, absolutely up-to-date, six-volume *Landlexikon*, says in Vol. I (published 1911) that this metal was used for the following purposes: domestic and kitchen apparatus, art and craft work (*Kunstgewerbe*), scientific instruments, for inducing chemical reactions, as a substitute for lithographic slabs in the cheap multiplication of graphs and typescripts, and for fireworks. In view of these extremely limited uses (the principal one being for pots and pans) a world production of 65,000 metric tons in 1913 was already quite a remarkable thing.

The use of aluminium in modern technique is based on its high electric conductivity, its very low specific weight (2.7) and its aptness for alloy with other metals. The resulting compounds (chiefly made with copper, silicon, magnesium, iron) unite the low specific weight of aluminium with the mechanical and electrical virtues of the other metals (strength in case of iron, electric conductivity in the case of copper, ductility, brittleness, etc.). Aluminium is malleable at as low a temperature as +100°C. It, therefore, serves as an increasingly important raw material for cables, for the building of aeroplanes, motor-cars, railway coaches, and will, in all probability, continue to be used in wider and wider fields. Its present uses make it very important for military purposes. It is employed, for instance, in the building of torpedo boats and U-boats, and

in the manufacture of thermit for bombing. Thermit is a powder consisting of a mixture of metallic aluminium and iron oxide (Fe_3O_4); when lighted, this mixture burns and develops a blazing heat ($3,000^\circ\text{C}.$). Thermit powder is, therefore, used as a filling for incendiary bombs to be thrown from aeroplanes, and seems to have a great future. . . .

Aluminium is not found at all in its pure elementary form, but is quite common as a component of all clayey substances. It can be produced from clay, but only at a pinch and with the help of an enormous quantity of electric power. So the fact that it can be made from clay is unimportant in peace-time, but in war-time no country that has clay in its soil and can afford the consumption of the necessary electric power need be really short of it. That is why all who look at the military side of the problem of raw materials discount a great scarcity of it anywhere under such conditions, and even bring aluminium into their plans as the one great, nearly inexhaustible, source of substitutes for other metals. Maybe they are right; we shall discuss these questions later. But in peace-time, when cost is not a *quantité négligeable*, only a raw material which is rich in metal and gives it up with comparative ease and only cheap electric power in the smallest quantities possible are used.

The highest content of aluminium (in the form of the compound Na_3AlF_6) is present in cryolite, an ore which is found and mined only near the western coast of Greenland. The mines there are the property of the Greenland government, the number of lodes known to exist is rather limited, and the quantity mined annually is, therefore, limited by the government according to how much money they need to balance the budget. The quantities exported from Greenland have been :

TABLE T15.
EXPORTS OF CRYOLITE FROM GREENLAND, 1928-1935.

In 1,000 Metric Tons.							
1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.
25.9	29.8	36.2	17.7	17.9	10.4	15.2	25.2

Cryolite is rarely used as the only raw material in making aluminium in the electrolytic way. It is too expensive for

that. But one of its useful qualities is that other aluminium ores are soluble in cryolite when this is made molten by heating ; so cryolite is added to these other ores when they are subjected to electrolysis. The most important among these ores is bauxite, a mineral originally found only in France, but now produced in large quantities in some other countries as well. Table A2 (1) shows the distribution of the production of these ores. By far the largest volume is still produced in France. For the other countries given in the table the order, according to size of production, was :

TABLE T16.

ORDER OF RANK OF BAUXITE-PRODUCING COUNTRIES, 1929 AND 1934.

	1929.	1934.
Italy	5	2
Jugoslavia	6	5
Hungary	1	3
U.S.	2	1
British Guiana	3	6
Dutch Guiana	4	4

The comparatively comfortable situation of Italy and the diminishing importance of British Guiana deserve particular note.

The production of the metal from bauxite and cryolite is centred round the sources of cheap electrical energy produced from falling water. In Europe Germany, Switzerland, France and Norway are the chief producing countries, and in North America Canada appears as an important producer side by side with the U.S. Germany easily held first place in Europe in 1934 and second place in the world, though she scarcely produces any ore. Technological, industrial and military interests depend on aluminium, and the production of the metal is a state monopoly (for military reasons), a fact which removes all difficulties of capitalization from the way of the industry.

The table showing the volume of international trade reveals a steep decline (about 60 per cent.) in the quantities of aluminium crossing international frontiers from 1929 to 1932, but a far from equal drop in the shipments of bauxite (only about 30.5 per cent.). German exportation had almost entirely

stopped in 1934, while her imports were very large. The following table gives an idea of the situation :

TABLE T17.

GERMANY : CONSUMPTION OF ALUMINIUM, 1929-1935.

					In 10,000 Metric Tons.		
					1929.	1934.	1935.
Production	...	...	...	...	33	32	70·8
Imports	...	...	...	...	14·2	6·4	18·1
Totals	...	...	...	...	47·2	38·4	88·9
Exports	...	...	...	...	4·1	·7	·2
Consumption	...	...	...	...	43·1	37·7	88·7

Consumption had then, in 1934, already nearly reached the enormously high peak of 1929 ; in 1935, under the pressure of rearmament, it had more than doubled it. This quick recovery in the industry was attained, as Table A2 (4) shows, in spite of the fact that prices in Germany went on decreasing till 1935, and did not recover before July, 1936, where our table ends. In the U.S. the gold price of aluminium continued to fall right up to the end of our table. But on the whole the aluminium price drop in Germany with her monopoly had been small during the slump. The percentage decrease in its price from 1929 to July, 1936, was

in the U.S.	...	...	...	50·6
in Germany	...	...	...	24·4

or less than half as much in Germany as in the U.S. with her competitive production of aluminium. But the systematic use of aluminium in Germany as a substitute particularly for copper, forced on industry more or less directly by the government, had some importance on the level of its price also. In other countries such substitution could not be very attractive at a time when copper, as a consequence of the slump, was " dirt cheap ". In Germany substitution was enforced by the limitations put by the government on the importation and use of metals of foreign origin ; so its comparative expensiveness could have no bearing on the problem.

Though the government of Greenland restricts the production

of cryolite according to budget requirements, it has never shown the least sign of differentiating between foreign customers.

3.—*Chromium.*

Chromium is a metal used for making several important alloys and coatings. The coatings protect the underlying material against the oxygen of the atmosphere. The alloys are very hard and resistant to rust ("stainless steel") and organic acids. An alloy of chromium and nickel is very much used for electrical heating apparatus, as the electrical resistance of chromium is very high. The age of electric heating and cooking opens a great future for it. Some of the chromium compounds provide important dyes and pigments. The metal is used for photomechanical processes, and as a rapidly-acting tanning material its use is now widely spread.

As our table shows, the distribution of chromium in the world is very "haphazard" (in a politico-economic sense). Its use is quickly increasing, as is that of all metals which are used in the making of the long range of new alloys, particularly iron alloys, which are so characteristic of new technique. The rapid development of production in Turkey is worth noting. Two important producing countries, viz., New Caledonia (French) and Southern Rhodesia (British), are colonial.

Chromium alloys with steel often contain as much as 17 per cent. chromium metal; this high percentage is bound to lead to a further quick increase in consumption. As it is doubtful how far the existing mines may be able to keep pace with this demand the situation may end in a strangling of further use by very high prices and in the partial diversion of demand to other substitutes.

4.—*Copper.*

Copper is so well known a metal that it is scarcely necessary to say much about its world-wide and vital importance for our economic life and about its technical achievements. Its enormous importance for the age of electricity is a truism. Copper is a widely-spread metal. It is found, in small quantities, in so many parts of the world that mankind could use it as the basic metal of civilization on a comparatively large scale, at a period when populations were still very thinly scattered

everywhere, even though transport from country to country was very limited. We find "bronze ages" all the world over in the more remote or recent past.

The total production of copper ores has increased in an imposing way. Table A4 (1) shows for the period 1913 to 1929 an increase of something like 100 per cent. The drop during the slump was very severe, nearly 54 per cent. from 1929 to 1932, which brought production down again into the neighbourhood of the 1913 level and even slightly below it for one year. Only for that one year; the recovery was immediate and very quick.

If we take for our guidance the figures for 1929, when presumably all producing areas, at the top of the boom, did their best to produce whatever they then could, we find that if we compare the total area of Europe (excluding the U.S.S.R.) with overseas territories of something like a similar size which are important producers of copper ores, we get

TABLE T18.
COPPER PRODUCTION IN SOME COUNTRIES, 1929.

				In 1,000 Metric Tons. Production of Copper Ores
Europe	...	...	...	132.6
Canada	...	...	...	112.5
U.S.	...	...	...	905

Among these European countries there was at least one, Yugoslavia, which was able to increase her production of copper ores considerably through slump and recovery. The European production as a whole fell comparatively little during the slump (by only about 15 per cent.), whereas the U.S. production fell by 76 per cent.

The production of copper ores has pursued an astonishingly meandering course round the globe during the last quarter of a century. The following table of the changes in the relative positions of the chief producing countries shows this. To get a correct picture, however, we must add to the Table A4 (1) the production of copper in the smelting works of Katanga (Belgian Congo), as this country does not publish statistics of the quantities of copper ores mined, and smelts and refines

practically all its ores before exportation. We disregard Japan, as she is a minor producer. So we find :

TABLE T19.

RELATIVE IMPORTANCE OF COUNTRIES PRODUCING COPPER, 1913-1934.

	1913.	In 1,000 Metric Tons.		1932.	1934.
		1929.			
World production	990.4	1,947.6		900.8	1,287.3
U.S.	555.4 /1/	905 /1/		216 /1/	217.1 /2/
Chile	42.3 /3/	320.6 /2/		103.2 /3/	256.7 /1/
Canada	34.9 /4/	112.5 /4/		112.3 /2/	166.5 /3/
Northern Rhodesia	— /7/	5.6 /7/		88.6 /4/	140 /4/
Mexico	52.6 /2/	86.6 /5/		35.2 /6/	44.3 /6/
Peru	27.8 /5/	54.4 /6/		21.5 /7/	27.6 /7/
Katanga	7.5 /6/	137 /3/		54.1 /5/	110.1 /5/

Figures between // indicate the relative positions of the several countries ranked according to volume of production. If we arrange the countries in order of importance as producers we see the following developments :

TABLE T20.

CHANGES IN RELATIVE IMPORTANCE OF SOME COUNTRIES IN THE PRODUCTION OF COPPER ORES, 1913-1934.

1913.	1929.	1932.	1934.
1. U.S.	1. U.S.	1. U.S.	1. Chile
2. Mexico	2. Chile	2. Chile	2. U.S.
3. Chile	3. Katanga	3. Chile	3. Canada
4. Canada	4. Canada	4. N. Rhodesia	4. N. Rhodesia
5. Peru	5. Mexico	5. Katanga	5. Katanga
6. Katanga	6. Peru	6. Mexico	6. Mexico
7. N. Rhodesia (nothing)	7. N. Rhodesia	7. Peru	7. Peru

We must not forget that during these years many countries which we have not included in our tables, as they were not of real importance as copper producers, would have come before No. 6. For a country to have dropped to one of the two last places in our list means, therefore, at least after the war, that it has fallen into comparative insignificance. To discuss the reasons for the repeated dramatic changes which we find in our table would lead us too far away from our subject. But the peripeties of this development are themselves memorable enough and will turn up again in our later discussion of the problems.

24 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

But copper is not the only case where changes of this kind occur. Mr. Lippincott says on p. 114 of his book :

“ A very common phenomenon in the extraction of minerals is the abandonment of sources which were formerly worked, upon the development of other areas which reveal a lower cost.”

He goes on to mention that this has occurred with gold, silver, iron, coal, petroleum, and proceeds :

“ This process of abandonment is always a serious matter for property-owners and for capitalists who have invested funds in works, but it also at times is a matter of considerable national interest. To abandon a partially exploited resource involves the loss of a portion of the mineral remaining in the ground, for this remaining material can only be reclaimed at a later date at great cost.”

Though this seems some overstatement of the case, as the careful comparison of the two halves of the last sentence shows, we have no objection to the author's conclusion, because the fate of the working population of the abandoned mining district, of the trades catering for them, etc. (which Mr. Lippincott does not mention), is in jeopardy also. Again, he says :

“ The question of competitive exploitation of resources involves the matter of conservation of national resources.”

We would add : and of the international resources also.

So this shifting of the centre of gravity of production within a comparatively short time, and in spite of international endeavours to stop it, is not a feature of copper alone, but is a more or less general problem. As such it will be treated later in its impact on some of the most interesting questions of international commercial policy.

Table A4 (2) again shows us that the processing of the ores, at least in a number of important cases, is quite differently distributed, internationally, from the mining of the ores. The general tendency for the world as a whole is, however, similar to that of the production of ores.

TABLE T21.

PRODUCTION OF COPPER IN ORES AND OF COPPER METAL, 1913-1934.

			In 1,000 Metric Tons.	
			Copper Content of Ores Mined.	Copper Produced.
1913	...	...	990.4	1,018.5
1929	...	...	1,947.6	1,894.7
1932	...	...	900.8	929.1
1934	...	...	1,287.3	1,280.9

The following changes in world production can be calculated from these figures :

TABLE T22.

CHANGES IN PRODUCTION OF COPPER IN ORES AND OF COPPER METAL, 1913-1934.

			In per cent.	
			Ores Mined.	Metal Produced.
1913/1929	...	...	+97	+86
1929/1932	...	...	-54	-51
1932/1934	...	...	+30	+38

So here, in these statistics, we find no sign of a widely spread use of scrap metal in copper production.^{8a}

The degree of discrepancy between the production of copper ores and of metallic copper in the different countries is best shown by a table showing changes in relative importance. If

^{8a} But this is not so certain as this table might seem to prove. For Germany, at least, the figures for copper production available for 1913 to 1925 allow us to calculate the proportion of copper produced from scrap, as shown by the following table :

TABLE T22a.—PROPORTION OF COPPER PRODUCED FROM SCRAP IN GERMANY, 1913-1925.

				In 1,000 Metric Tons.						
				1913	1920	1921	1922	1923	1924	1925
From ores, etc.	...	...	...	41.5	20.5	25	32	26.2	34.6	39.1
From scrap	...	...	...	8	28	39	46.5	47.9	36.5	41.1
Totals	...	...	...	49.6	48.5	64	78.5	74.1	71.1	80.2
Per cent. from scrap	...	...	...	16	58	61	59	65	59	51

we limit ourselves to the eight first places and to the year 1934 we get the following :

TABLE T23.
COUNTRIES PRODUCING COPPER ORE AND COPPER, NUMBERED ACCORDING TO RELATIVE IMPORTANCE.

	Rank among Producers of	
	Ore.	Metal.
Germany	below 8	7
U.S.S.R.	8	below 8
Chile	1	1
Canada	3	3
N. Rhodesia	4	5
Katanga	5	6
Jugoslavia	6	below 8
Mexico	7	below 8
U.S.	2	2
Belgium	nothing	4
Japan	nothing	8

Of some significance politically is the fact that among the producers of ore, France with her colonies, Great Britain, Germany, Italy with her colonies, and Japan with hers, play a rather insignificant part, and that among the British colonies only Northern Rhodesia saves the situation. In this respect at least four of the seven Great Powers might be called "dissatisfied" nations.⁹ As to the distribution of the actual production of copper, things are rather different ; we find the

"satisfied" and the "dissatisfied" nations to be :

Germany.	Russia.
Japan.	Italy.
Great Britain (thanks to	France.
N. Rhodesia only).	
U.S.	

⁹ But there is a qualification to be added to this statement. The following table describes the aggregate balance sheet of the three so-called "Have-Not" nations (Germany, Italy, Japan) in regard to copper for the years 1933, 1934 and 1935 :

TABLE T23a.—BALANCE-SHEET OF "DISSATISFIED NATIONS" IN REGARD TO COPPER

	in 1,000 long tons of Copper		
	1933	1934	1935
Imports	495.5	622	730.7
— Exports	97.5	87.4	68.1
+ Home production	397.9	535.5	662.6
Balance	110.2	122.3	128.3
	517.1	657.8	790.9

These balances were, then, available for consumption or the laying-in of stocks : certainly not particularly poor results.

Table A4 (3) shows the steady and considerable decrease of international trade in copper and copper ores. The third line of this table is given in money terms, as it is obviously impossible to add up copper cables and copper buttons by means of any other common denominator. But money figures may be misleading. The particularly large fall, and the continuation of the decrease beyond 1932, are to be explained partly by the fact that this line expresses the result of the multiplication of decreasing quantities by decreasing prices.

The figures in the next Table A4 (4) concern chiefly countries of minor interest. A preponderance of home consumption over exports is of interest in the following particular cases :

TABLE T24.
COPPER CONSUMPTION OF THREE COUNTRIES, 1934.
In 1,000 Metric Tons.

- (1) Germany : production 105 ; imports 180 ; exports 12 ; *consumption* 283.
- (2) Belgium : production 106 ; imports 74 ; exports 61 ; *consumption* 119.
- (3) U.S. : production 407.1 ; imports 175 ; exports 238 ; *consumption* 344.1.

But as these figures exclude for Germany "copper refined from foreign raw copper and copper salvaged in factories making semi-finished copper goods," and as it is unknown how far recovered copper is included in the Belgian figures, whereas the figures for the U.S. include all "secondary" copper, the value of these figures is not great ; the consumption in Germany was certainly much more, and that in Belgium may or may not have been larger.

But even so, it is very interesting to see how near Germany has come to the level of the U.S. in her consumption of copper, while there is even a distinct possibility that she actually consumed more.

Table A4 (5) shows in its first line that the international convention for limiting the output of copper has been successful. Though production was increased after 1932 it was kept within such limits that world stocks of copper, which had attained a tremendously high figure in that year, decreased considerably during the following years. This could be done only, as the two other lines of this table show, by allowing prices to decrease still more. The minimum was only reached as late as about the middle of 1935, and the rise since then up to the end of our table is very modest ; only 1937 brought a real recovery in prices.

5.—*Gold and Silver.*

The tables under this head do not require much explanation. Statistics of the production and movement of precious metals are particularly reliable and detailed. Though quite an amount of gold and silver is used for industrial purposes the field of its employment here does not seem to widen very much ; use for monetary purposes and the making of jewellery and of silver plate are entirely in the foreground. Silver plate, it is true, has come to be used much more widely all the world over during the last two-score of years or so, during which time the production of the metal has increased enormously. Silver, therefore, lost much of its value in terms of gold (53·8 per cent.) between 1928 and 1933. It recovered only a very small piece of ground when the American Treasury began to buy silver on a large scale, as China got rid of great quantities of silver currency at about the same time by changing to a kind of gold currency.

So much has been said about the unequal distribution of the world's gold mines that it is scarcely necessary to go at any length into that matter. Table A5 (5) shows with what enormous speed the known stocks of gold in the currency banks and in monetary circulation have increased during the last ten years. The increase in the purchasing power of gold, a consequence of the universal drop in the prices of commodities and in wage rates since the breakdown of 1929, has given a new fillip to production. The latter rose by 28·4 per cent. from 1929 to 1934. But this table requires some explanation. The temporary decrease of " visible " gold stocks which apparently occurred in 1930 is only a consequence of the fact that, beginning with that year, our table no longer includes gold in monetary circulation (in itself nowadays no longer an important amount). The decrease in 1933 is explained by the disappearance of large quantities of gold into hoards, particularly in France. The increase of visible stocks in 1934—1·3 million kg.—is in excess of that year's production by no less than half a million kg. This hints at the element of uncertainty which is introduced into the figures of our table as well as into the situation in the world markets by the hoarding and de-hoarding of gold. The gold output of every year is supposed to flow into central banks to the tune of about 60 per cent.

If this assumption is correct, the production of the year 1934 would have meant an increase of (statistically) "visible" stocks by 510,000 kg. or less than 3 per cent. In view of these facts it would seem that the considerable inequalities in production are of less actual importance than the still greater inequalities in possession and in resources for acquisition in other ways than by production.

These inequalities are indeed important. As to production: if we take the year 1933, we find that, of the whole world production, 15 per cent. came from the U.S.S.R., 11.8 per cent. from Canada, 9.2 per cent. from the U.S., and 44.1 per cent. from South Africa; the rest of the world together produced only 19.9 per cent.

As to the possession of gold, we find the following interesting data for the year 1934 (for simplicity's sake I give the figures in million RM.):

TABLE T25.

DISTRIBUTION OF GOLD STOCKS, 1934, IN MILLION RM.

The world	54,880	British Empire	1,927
Europe	29,537	Other colonies	273
Non-colonial America	22,048	Other countries	1,095

But we have to re-group these figures for the sake of greater clarity:

TABLE T26.

DISTRIBUTION OF GOLD STOCKS, 1934, BY COUNTRIES.

	In million RM.	Relative Importance
<i>British group:</i>		
Great Britain	3,928	
Dominions ¹ and India	1,887	
Colonies, protectorates, mandated territories	40	
	5,855	/3/
<i>France:</i>		
Mother Country	13,745	
Colonies, protectorates, etc.	62	
	13,807	/2/
Belgium and colonies	1,469	/8/
Germany	152	
Italy	1,284	
U.S.S.R.	1,845	/4/
U.S.	20,425	/1/
Japan, including Manchuria	981	
Netherlands and colonies	1,676	/6/
Switzerland	1,593	/7/
Spain	1,837	/5/

¹ Excluding Southern Rhodesia.

The U.S.S.R. stocks have shown a remarkably steady increase throughout recent years, whereas those of other countries have been subject to wild fluctuations, and Germany has lost her gold with constant obstinacy. The figures for 1934 are quite obsolete now as I write this (January, 1937), because in the meantime France has lost much gold and Italy the best part of what gold she had got before her Ethiopian war. Whereas other countries, particularly England and the U.S., have got so much more of it that they are now in serious difficulties as to what to do with it all. There is an increasing tendency to "sterilize" gold; but that sometimes the possession of large stocks of gold, in the banks, in monetary circulation, or in private hoards, may be of help in times of scarcity and of breakdown of important exports during a slump, can be seen from the recent experience of India. Up to the end of 1930 India had been, on balance, an importer of gold for many years, and had been able to build up an important reserve in the hands of her government, as the succeeding figures show:

TABLE T27.

GOLD IN POSSESSION OF GOVERNMENT OF INDIA, 1913-1934.

In million RM.									
1913	1926	1927	1928	1929	1930	1931	1932	1933	1934
520	456	506	527	544	538	679	680	681	681

In 1931 India began to export gold on a large scale; she lost gold to the following extent:

TABLE T28.

LOSSES OF GOLD FROM INDIA, 1931-1934.

To				For million RM.			1934
				1931	1932	1933	
Great Britain	...	...	...	265	895	499	513
France	...	...	...	9	4	5	-
The U.S.	...	...	...	34	112	108	188
Totals	...	...	...	304	1,011	612	701
And produced	...	...	...	28	29	29	28
NET LOSS	...	...	...	276	982	583	673

Over the whole period this meant a loss of no less than 2,514 million RM. or about five times the reserve of the government. It must be added that this gold had been acquired and saved by the Indian population at times of high prices and was spent again in times of low prices, so that a distinct gain on the purchasing power of at least 40 per cent. ought to have been made, covering the loss in interest over quite a number of years of hoarding.

These changes are so frequent that there is not much point in bringing the figures up to the most recent date—they become obsolete again while the ink of the manuscript dries. In any case we have seen that the international inequality in the distribution of gold stocks is of a more serious character than the quite different international inequality in the distribution of production.

Silver is scarcely a raw material of much political importance at the present moment. We might say of it, stealing another author's *bon mot*, that it has a great future behind it. Its great loss of value during the slump and its hesitating recovery (as long as purchases for monetary purposes do not enhance its price artificially for a time) show that it is, to a certain extent, more a source of embarrassment than of advantage for a country nowadays to have a large silver production. Only the richest deposits are still mined for the silver itself. But its production is, to a certain extent, an automatically functioning side-line in the production of other, more important metals, like gold, lead, copper and zinc. This maintains large-scale production even at extremely low prices and, as long as gold monometallism sweeps the field, makes hopeless all endeavours to bring the price of silver back again to the neighbourhood of the old, famous, but now long-lost gold-silver ratio of 16 : 1.

6.—*Lead.*

Lead serves many important purposes, from gunshot and water-pipes to accumulators, soldering media, flint glass, pigments and letterpress. Most of the figures in our tables explain themselves, but a few comments may be made ; for instance, that Great Britain and Jugoslavia increased their production right through the last depression ; and that the

recovery in some countries was quite rapid. Nineteen thirty-four showed a level of output nearly as high, or even higher, than in 1929 in the following countries :

Producers of lead ore.

Germany.
Great Britain.
Jugoslavia.
India.
Canada.
Australia.

Producers of lead.

Germany.
Australia.

The brunt of the losses was, and still is, borne chiefly by the U.S., Mexico and Spain. The drop in the quantities passing through the channels of international trade was not particularly deep during the slump: only about 26 per cent.—much less than the drop in production. On the other hand, visible stocks on the world market did not decrease, but went on increasing during the first two years of recovery, in spite of a particularly steep and progressive fall in prices, which changed into an increase only in the early months of 1935.

The production of lead ore in small quantities is widely spread. Large-scale production is, so far, concentrated in North America and Australia.

7.—*Manganese.*

Manganese is chiefly used to make steel tough and hard; for that purpose alloys with iron containing 6 to 12 per cent. of manganese are widely used. There are four countries with a large-scale production of the ore: the U.S.S.R., the U.S., India and the Gold Coast. The metal is nowhere produced as a pure metal on a large scale, as it is not used in that form for any quantitatively important purpose; alloy steels for special uses are made with the help of manganese compounds.

The slump had an enormous effect on the production of the ore. The percentage decrease from 1929 to 1932 was: in Germany 88, in the U.S. 97, in Egypt 99·8 per cent. Relatively the best resistance was shown by the manganese ore production of Russia, where the drop in production was only one of 30 per cent. But the fact that there was a drop in that country at all, as opposed to the developments in most branches of mining

in Russia during this time, is worth noting. Recovery was quick in Germany and in the Gold Coast, particularly slow in India and the U.S., and of moderate speed in the other countries.

International trade did not show quite the same deep wounds, though the losses were certainly big enough. The deepest point of the depression was again reached in 1932, when shipments were below those of 1929 by 71 per cent. Recovery began quickly, on the whole, in 1933.

As the Gold Coast is one of the important producers of manganese this is one of the few cases in which colonial countries have some importance as sources of mineral wealth.

8.—*Nickel.*

Statistics of nickel production are very incomplete. But in comparison with Canada all other countries are unimportant as producers of this ore.

The U.S. since 1921 imported and exported nickel in the following quantities :

TABLE T29.
NICKEL IN FOREIGN TRADE OF THE U.S., 1921-1934.

	1921/25.	1926/30.	1931.	1932	1933.	1934.
	Annual Averages.					
	In 1,000 lbs.					
Exports of metal and alloys ...	3,203	2,353	1,777	2,059	1,509	4,576
Imports :						
Ore ...	8,195	18,709	11,630	5,918	19,220	11,846
Nickel oxide...		1,772	305	688	2,019	950
Nickel in pigs		42,068	23,862	14,923	31,621	45,800

The production of metallic nickel shows the following changes for the U.S. :

TABLE T30.
PRODUCTION OF NICKEL IN THE U.S., 1915-1934.

In Short Tons of .907 Metric Tons.					
1915	1920	1925	1930	1933	1934
822	365	272	308	126	157

For the years 1928-1930 the following figures are interesting :

TABLE T31.
WORLD TRADE IN NICKEL, 1928-1930.

	In Long Tons of 2,240 lbs.		
	1928.	1929.	1930.
A. Exports :			
(1) Ores and matte ^{1,2} :			
(a)	20,526	18,345	21,707
(b)	2,570	7,096	8,122
(2) Metal and alloys ...	41,421	48,889	34,291
B. Imports : ³			
(1) Ores and matte ...	13,669	32,215	27,059
(2) Metal and alloys ...	45,890	54,419	38,279

¹ Partially processed ore. ² Including nickel oxide. ³ Less re-exports.

The table cannot unfortunately be added up, as line (a) gives figures for the nickel content of ores and matte, whereas line (b) gives the weight of the minerals.

It can be seen from these figures that most of the ores mined in Canada and New Caledonia (the only other producer country of any importance) are smelted and refined, or at least partially processed, in the country of origin. It is probably a high estimate if we assume that the nickel ores contain as much as 10 per cent. of nickel.

On the whole the statistics are thoroughly unsatisfactory if inspected with a methodical eye. But they allow us to draw the following conclusion : Canada enjoys a quasi-monopoly of the production of the ore, and its only, though quite subordinate, partner is a French colony.

Nickel-mining in Canada is organized on the basis of a private capitalistic monopoly. That this has not worked worse than free competition in other branches of ore-mining has done can be seen from the fact that the drop in prices from 1929 to 1932 was not particularly large, though certainly deep enough, showing that the crisis could be stood with a remarkably moderate and slow decrease of the price. The deepest point in our Table A8 (b) was only reached in 1934.

Nickel is of great importance. It has many convenient uses, e.g., in the manufacture of coatings protecting other metals against tarnishing, and in the making of "German silver", which contains two-ninths of nickel, etc. But its chief

importance is technical and nautical; the iron-plates of battleships and armoured cruisers consist of a steel alloy containing about 5 per cent. of nickel.

9.—*Quicksilver (Mercury).*

The world depends for its provision of quicksilver chiefly on three countries: Spain, Italy and the U.S. These three countries among them produced in 1929 no less than 94·8 per cent. of the total quantity produced on the globe.

Among the countries producing small quantities some are perhaps worth mentioning. The production in Japan in 1929, including Korea, was 3,903 lbs., in Algeria 10,415 lbs. For the world market both quantities were, of course, negligible.

10.—*Tin.*

Old-established European tin-mining has never been on a large scale, and the mines have been worked over such long periods that the lodes give nowadays only poor results. At the same time tin has become more and more important of late years owing to the larger scale on which tinplate is used for "tinning" or "canning" all kinds of eatable and drinkable things. Beer in tins instead of in bottles or casks—an idea rather terrifying still to an average Chestertonian European—is, after all, becoming a quite ordinary thing in American life since the dawn of the New Deal. No wonder, then, that the production of tin ore and metal has increased very quickly in recent times. Scrap material is not used in the production of tin to a large extent, as yet. To recover the very thin layers of tin from tinplate is technically quite possible, but expensive and, therefore, not economically attractive.

The chief producing countries now are, as Table A10 (1) shows, two British colonial territories (British Malaya and Nigeria), the Dutch East Indies, Belgian Africa and two independent states, Siam and Bolivia, both of which are distinctly on the up-grade in producing tin. In 1929 British Malaya, the Dutch Indies, Siam and Nigeria, producing between them no less than 65 per cent. of the world output, measured in tin content of the ores, became the chief partners in an international private organization for the limitation of the production of tin ores. On February 27th, 1931, the governments of Bolivia, the Dutch East Indies, Malaya and Nigeria con-

cluded an agreement on restriction of output, which the government of Siam joined in September of that year, and the governments of the Belgian Congo, French Indo-China, Great Britain (for Cornwall), Portugal and Ruanda-Urundi joined in the course of 1934. By this year the distribution of production within the organized group had changed distinctly—at the cost of British Malaya, which delivered 36 per cent. of the world production in 1929, but only 30½ per cent. in 1934. The chief gainer was Siam, with the Dutch Indies coming second.

The development of production and consumption is shown for the years after 1924 by the following table :

TABLE T32.
PRODUCTION AND CONSUMPTION OF TIN, 1925-1935.

		1925	1926.	1927.	1928.	
Production	1,000	148.1	145.2	159.3	178.8	
Increase (—), decrease (+) of stocks	metric tons	+8 ¹	+6.6	+1.4	—3.7	
Actual consumption	tons	156.1	151.8	160.7	175.1	
Price (per 100 kg., London, blocks)	RM.	522	582	577	456	
1929.	1930.	1931	1932.	1933.	1934.	1935
195.1	177.5	149.6	98	89.4	118.1	149.8
—8.4	—15.5	—13.4	—1.9	+15.4	+21.9	+4.4
186.7	162	136.2	96.1	104.8	140	154.2
412	286	222	197	265	286	272

This shows that consumption shrank between 1929 and 1932 by 49 per cent., production by nearly 50 per cent., and price by 52 per cent., *i.e.*, slightly more than the two other items.

The largely colonial character of the production of tin ores and tin metal is worth noting. We find that the percentage of colonial production was as follows in the years 1929 and 1934 :

TABLE T33.
COLONIAL PRODUCTION OF TIN, 1929 AND 1934.

	Per cent. of Total Production. 1929.	1934.
Output of ores (tin content)	58	53
Output of metal	62	49

¹ This figure from J. K. *Eastham*, *Review of Economic Studies*, October, 1936, p. 18, the others from German Statistical Abstracts.

This high proportion of colonial smelting is particularly remarkable. Recently, however, the most important colonial smelting place, Singapore, has lost much of its former large share.

The Tables A10 (5) and (6) indicate the results of the policy of limitation of output. The drop in prices during the slump was rather marked (52 and 51 per cent. from 1929 to 1932 in both columns of Table A10 (6)). The movement of gold prices of tin for the last ten years before the war and for the time after 1923 is shown by the following table:

TABLE T33a.
PRICES FOR BANCA TIN AT HAMBURG, 1905-1914 AND 1924-1935.

In RM. per 100 kg.											
1905	1906	1907	1908	1909	1910	1911	1912	1913	1914		
304	383	366	285	285	324	400	441	427	348		
1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
481	542	601	610	470	430	295	233	213	279	306	302

I quote this series, though it shows a gap (for obvious reasons) of nine years after the beginning of the war, because the prices in RM. may be used as gold prices without further conversion. They give us the following averages for longer periods:

	(1) 1909-1914	(2) 1930-1935	(2) in % of (1)
For a period of 6 years ...	371	271	73
	1905-1914	1926-1935	(2) in % of (1)
For a period of 10 years ...	356	374	105

The movement of prices before the war was certainly less hectic than after 1923 (range of prices 1905-1914 = 35 per cent., 1924-1935 = 65 per cent. of the highest price). But that is characteristic of nearly all price movements during these two periods and is chiefly caused, in the case of tin, by the deep drop in 1931 and 1932 which the "monopoly" did not (perhaps could not) prevent.

The drop in tin prices began already years before the general slump (they reached their peak between August, 1926, and March, 1927). Recovery in prices was at first quick, then distinctly slow, and showed later a tendency upwards, though with temporary variations. The movement up to June, 1936, is shown by the following table :

TABLE T33b.

MONTHLY PRICE MOVEMENTS OF BANCA TIN AT HAMBURG, 1934-1936.

In RM. per 100 kg.

Year.	January.	February.	March.	April.	May.	June.	July.
1934 ...	306	295	301	319	316	300	304
1935 ...	305	305	297	294	298	305	306
1936 ...	290	286	292	286	280	260	

Year.	August.	September.	October.	November.	December.
1934 ...	303	304	305	305	306
1935 ...	301	302	305	309	302

For later months comparable data are not yet available, though it is known that a considerable rise in prices again took place between the summer of 1936 and the spring of 1937, only to be followed by a new slight, but distinct setback with a period of hesitating recovery in the second quarter of 1937.

The tendency towards recovery in prices since 1933 is a general one for all raw materials, with or without monopolistic control of output, and is not a particular feature of tin, and the fluctuations in the price of tin (which varied over a period of 30 months by RM. 59 = 18 per cent. of the highest price) are not exceptionally large but fairly normal. The large stocks which had developed during the slump were unloaded at moderate prices; in July, 1936, stocks had diminished to 15,700 metric tons, *i.e.*, below the figure for any year in our Table A10 (5). Restriction, during the last two years, of production has been moderate in extent. Prices were excessive for years (1924-1929) before the "monopoly" was organized, but have gradually become very moderate since; the average prices were (in RM. per 100 kg.) for 1924-1929: 522; for 1930-1935: 271. Of course, one may argue that prices might have fallen much deeper still during the slump had it not been

for the intervention of the syndicate. But does that amount to much more than to the rather trite argument that anything for which you have to pay at all is too expensive? In any case, we should not expect figures like the series with which tin provides us to be taken as a striking proof of intolerable monopolistic exploitation.

The Federated Malay States introduced in 1903 a practically prohibitive export duty of \$11.50 per picul (133 lbs. or 60 kg.) on exports of all tin ores not to be smelted in the Straits Settlements; this was the work of Sir Frank Swettenham who was at that time both High Commissioner for British Malaya and Governor-General of the Straits Settlements. In 1904 the exemption from duty was extended to ore exported to the United Kingdom and in 1916 to that exported to Australia. Smelting of tin stopped for a time in the U.S. as a consequence of this policy; when it later re-established itself, it processed Bolivian ores. After the war the same policy was introduced in Nigeria. The importance of this discrimination by export duties was never so much that it influenced the ultimate availability of tin metal to the several nations as that it shifted smelting and refining. As the example is unique in character it is worthy of mention.

11.—Zinc (*Spelter*).

As our tables show, zinc is a metal produced in many countries. Europe is quite a large producer, and some colonial territories come into prominence as producers, such, for instance, as Northern Rhodesia, French Indo-China and Algeria. Our Table A11 (4) shows that only a slight decrease of stocks has taken place since 1932; and the renewed drop in prices, in the midst of recovery, proves that there is a particularly strong tendency towards overproduction. It should be noted that at least one colonial country, viz., Northern Rhodesia, is a producer not only of the ore but of the metal also.

12 and 13.—*Metals of the Platinum Group and Minor Metals.*

Only a few notes are necessary to show why we include these metals in our tables; in a few cases, to tell the truth, we do so simply to be on the safe side.

Antimony.—Alloys used as type metal; compounds in the vulcanization of rubber. There exists an interesting

explosive form of the elemental metal which may be one of the nice surprises held in store for us for the next war.

Cadmium.—The ores contain only 1 to 5 per cent. of the metal. Provides alloys for quick soldering. Compounds serve as pigments.

Cobalt.—Serves chiefly for the making of pigments and paints.

Iridium.—In alloys with platinum is used to make implements for chemical laboratories; in alloy with osmium provides a material for the threads of electric bulbs.

Molybdene.—In a fifty-fifty alloy with iron makes an extremely hard steel, from which important implements used in the heavy industries are made.

Osmium.—See iridium.

Palladium.—Protects, when applied as a thin coating, the silver surface of the reflectors of large-scale flashlights in military use against tarnishing; serves to make non-magnetic watches to be used in laboratories, etc.

Strontium.—Interesting only for two reasons: it burns with a strong, deep-red flame, and the nitrate is therefore used for military purposes, as it serves for signal rockets; in this regard strontium is rather a key material. The hydroxide is used in the sugar refining industry.

Thorium.—The chief raw material for incandescent gas mantles, etc., and an important one for threads in electric bulbs.

Titanium.—Its tetrachloride, when evaporated, is the basic substance of artificial fog; it is very important for the production of smoke screens; it should be important in the next war and, by rights, popular with politicians all round.

Tungsten (Wolfram).—Gives very hard steels in alloy with iron and 30 per cent. chromium. Serves also as a material for the threads in electric bulbs. About 90 per cent. of the production goes into steel alloys.

Vanadium.—Very important, in alloy with iron, as a material providing extremely hard steel for quick-working, mechanical cutting implements, chisels, gears, piston rods, transmission shafts, gun barrels. Is also used in combination with chromium as a steel alloy.

B.—NON-METALLIC MINERALS.

1.—*Coal.*

Coal is the most important source of mechanical and chemical energy to-day, though it has found strong competitors in oil, and in electricity produced with the help of water-power, during the last two-score of years. Other combustible substances which in former times were more important as sources of heat, viz., wood and peat, have lost much of their customary use for these purposes, though locally they may still be important enough here and there. Both are very voluminous and therefore inconvenient for transport. Both contain a high proportion of water and non-burning mineral substance, so that their burning and heating value is seriously handicapped. Peat has become exhausted in many places where it existed in big quantities forty or fifty years ago. Wood generally can be used for more profitable purposes than for the production of mere warmth.

Coal, on the other hand, is being processed now in many ways, so as to provide combustible substances adapted to the requirements of modern technique; it is totally or partly coked; is ground into a powder. Coal dust is briquetted, brown coal is freed of water, and coal dust is liquefied or suspended in oil. Its great advantages in competition with oil are:

- (a) It is found in a much bigger variety of places, and is generally closer to the centres of large-scale industries than oil.
- (b) As far as we know it exists, within easy reach, in quantities immensely superior to those of oil.

Signs of the depletion of natural stocks of oil are distinct and even disquieting in many places. With coal this is true only to an incomparably smaller extent. The technique of extracting oil from the earth seems hardly open to much further improvement. The technique of coal-mining is still just as primitive in many a country, as it ever was. Large future reductions in costs and improvements in economic organization are therefore possible.

Let us first take a look at the Table B₁ (1) which gives us estimates of the coal seams which are supposed to exist on this planet. "Supposed," for the data are of very unequal and uncertain degrees of probability. But we may take it that the columns which give us the so-called "certain" seams are fairly safe as extremely cautious estimates. If we take the first estimate we find that the chief known deposits exist in the U.S. and in Canada, with Britain as a third and Germany as a fourth favourite of nature. Of the total known world supplies of 992 thousand million metric tons, these four countries are reasonably sure to contain respectively $511 + 185 + 141 + 89 = 926$ thousand millions.

But some other countries appear in the list with comparatively low figures only because they have been explored very perfunctorily. So far the quantity of coal coming on to the world market has been generally so plentiful that the inclination to invest on a large scale in the development of other seams has been limited to a few cases where large local consumption is found in the comparatively close vicinity of particularly easily-mined seams, as, *e.g.*, in India.¹⁰ Prospecting is expensive, the development of new mines very risky; and if we ignore the acute and short-lived scarcity of coal during and immediately after the Great War the problem has always been, during the last hundred years or so, how to sell all the coal which could be mined in the developed fields, not how to exploit new sources of this valuable mineral.

The comparatively wide distribution of coal is shown by Table B₁ (2) which gives details of present production. The fact that the figures for 1934 are generally lower than they were during the last year before the war is explained by three facts.¹¹

- (a) 1934 was only the second year of the upward trend of the trade cycle after a particularly deep slump;
- (b) During the last twenty years the progress made in the use of water-power and oil in the generation of electricity,

¹⁰ For details see the latest (third) edition of *V. Anstey's, The Economic Development of India, passim*, particularly the last chapter

¹¹ The discrepancy between the figures for world production in the Tables B₁ (2) and B₁ (3) is remarkable, though the trend shown by both tables is identical. I was unable to trace the causes of this discrepancy. The recovery from 1934 to 1935 was rapid.

in the movement of goods at sea, in the navies, and even by land traffic has been steadily developing ;

- (c) Technical progress in engine-building and in domestic heating has meant that the same quantity of coal burnt provides a much larger quantity of heat and energy now than before.

The slump brought all these factors to full development.

The most characteristic features of the above-mentioned table are : nearly all countries having important industrial activities are well provided with coal, the one glaring (and politically important) exception being Italy ; and in spite of their particularly rich seams of coal the proportion of the aggregate coal production of the world, of the combined shares of the United States, Canada, Great Britain and Germany, decreased from 84 per cent. of the whole quantity produced in 1913 to only 69·6 per cent. in 1935.

The concentration of the production of coal becomes clearly apparent if we look at the figures of production in 1935 :

TABLE 33c.

PERCENTAGE DISTRIBUTION OF PRODUCTION OF COAL BY REGIONS, 1935.

	In million Metric Tons.	In per cent. of World Production.
North American Centre ¹	387·7	30
Countries round English Channel ²	594·2	45
U.S.S.R.	102·2	8
		83
Split up	205·9	17
TOTALS	1,290	

¹ U.S. and Canada. ² Great Britain, France, Holland, Belgium, Luxemburg, Germany.

Production seems very small still in India, in comparison with the size of her industries and population. The same is true of the Dutch Indies and of China. Another estimate, compiled differently and obtained from a different source (nearly all figures for China are more or less clever or lucky guesses), tells us that the production of coal there was 13·4 million metric tons in 1913 and as much as 26 million metric tons in 1933. This example shows well with what caution all statistics of this

kind ought to be used. The two figures for the production of coal in China which are so widely at variance come, the one from the German Statistical Year Book, published at the end of 1935, the other from the *Statistical Handbook of World Economics*, published a few months later, at the beginning of 1936, both by the same German authority, the *Statistisches Reichsamt*.

Since 1914 the purchasing power of gold has generally decreased, and Germany has introduced high protective duties on imported coal. But in spite of that the price of coal is still comparatively low. The Reichsmark prices quoted in Table Br (4) are practically gold prices. During the various years of the last business cycle these were 10 to 25 per cent. higher in Germany, thanks to monopolistic and customs protection, than in countries which do not protect coal by fiscal measures. The true situation becomes obvious in the second line of that table, where we see that the value of British coal, in terms of gold, scarcely reached the pre-war level at the peak of the last boom and later dropped almost 44 per cent. below it. The recovery of 1932 to 1935 could not prevent a further drop and even the first half of 1936 brought only a tiny increase. This shows clearly that coal producers try to sell wherever they can and at whatever price they can get. The problem of the international distribution of coal has been, so far, chiefly one of finding markets for an almost permanent glut.

The quantities of coal entering into international trade are shown in Table Br (5). Here again we look in vain for the recovery which might have been expected from the changed phase of the business cycle. The list of exporting and importing countries (which excludes all those whose foreign coal trade is only small) not only shows, as we might expect, the importance of importation of coal to Italy, but further that two countries well provided with coal seams and with a large coal output of their own are heavy net importers, viz., Poland and France—the latter even to a larger extent than Italy. The net imports of Canada are equally remarkable in view of that country's rich coal seams. Her coal imports are practically identical with the exports from the U.S., and these latter

appear, by their smallness, rather disproportionate to the enormous quantities waiting unused in the soil of that large country.

2.—*Oil.*

Our statistical review of the stocks of natural oil in the various countries of the world is given in the form of alternative tables, only slightly different in age though rather dissimilar in their figures. The mere fact that several of them are presented here is meant to show clearly that they must be taken with the necessary scepticism. Large parts of the world have not yet been reliably prospected, though the stimulus for doing this—high profitability of a lucky *trouvaille*—is certainly not missing in this case.

But howsoever the tables differ, they have this in common, that they show to the consumers of oil the proximate danger of a quick exhaustion of existing known resources (and thereby open a distinct hope to the holders of coal-mining shares).

From 1928 to 1935 all the world over the production of oil increased from 184 to 226 million metric tons; this was an increase of 42 million tons or 22·8 per cent. in seven years, or roughly 3·2 per cent. per annum. We are, I think, on the safe side if we make the following two assumptions:

1. That this rate of increase during a period which included the deepest slump so far known in the economic history of mankind will be the minimum rate of increase which we must expect for quite a time to come.
2. That the stocks in the soil have remained undiminished between the time when the above several estimates were made and the end of 1935, an assumption which allows for quite a number of new discoveries without our results becoming particularly questionable.

If we work out the effects of such a rate of increase in the consumption of oil from such a starting point and apply it, with the further assumption that it will work on the principle of compound interest, we come to the following conclusions as to

the expected dates when the existing estimated stocks will be exhausted, according to the several estimates :

TABLE T34.
PROBABLE DATE OF EXHAUSTION OF NATURAL RESOURCES
OF OIL

	According to the Estimate of		
	Garfia (3,495 million tons).	American Petroleum Institute (5,774 million tons).	D. White (8,000 million tons).
Number of years after 1935	12 (1947)	18 (1953)	23 (1958)

Here, then, is one of the raw materials for which not only is economical international organization all-important, but for which a strong case can also be made out for a thorough international organization of prospecting.¹²

Equally remarkable is the existing distribution of production over the continents and countries of the world. Five countries (U.S., U.S.S.R., Irak, Iran and Venezuela) possess 21,700 million barrels or seven-eighths of the geological stocks according to Mr. Garfia's estimate. Between them, in 1934, these

¹² Mr. W. C. Teagle gives a good description of the nature of competition in the production of oil (and natural gas) in a contribution to Mr. Crowther's book (p. 110-111) from which I quote the following details: "Oil is unlike other minerals because it does not remain just where nature stored it until the time it is brought to the surface of the earth. . . . It flows towards the wells, wherever they may be, and that is why one producer may recover oil that really belongs to another producer. . . . When land above a pool is owned by many people, many wells are drilled. The oil is brought to the surface . . . regardless of whether every producer has a market for it, and regardless of dissipation of gas pressures and accelerated intrusion of water which will result, sooner or later, in placing enormous quantities of the oil beyond hope of recovery. . . . As the oil is produced in greater quantities than are required by the market, it is stored at heavy cost above ground. The producer offers it for sale for whatever he can get. . . . Refiners are tempted by bargain prices to buy oil in excess of their needs and to make more gasoline than the market demands . . . The ills of the oil industry are peculiar to that industry" (?) "and require peculiar remedies. These are modification of anti-trust laws, co-operation among producers, and the exercise of the policing powers of the States" (Italics mine) Would a high-pressure capitalist calling for international planning concerning his raw material! Mr. Mohr fills 30 pages of his book with an attempt to pooh-pooh the forecasts of an early shortage of oil in the world. But he only shows that the actual consumption of oil has increased very quickly, without going into the question of the size of the natural resources at all, so that we may safely discard his opinion as not dealing with the crux of the question at all.

countries produced 175 million metric tons, or about the same proportion of total production as their share in total geological stocks. This was in spite of the fact that production in Irak had scarcely begun and that in Iran output was distinctly low in comparison with all other countries where oil is known to exist. For the production of 1934 (in million metric tons) we find the following distribution amongst geographical units :

TABLE T35.

PERCENTAGE DISTRIBUTION OF OIL PRODUCTION BY CONTINENTS, 1934.

Colonial America	...	...	...	...	2
Independent America	...	...	...	...	155
TOTAL AMERICA	...	...	...	...	157
Colonial Asia	...	...	...	...	6.6
India	...	...	...	...	1
TOTAL ASIA	...	...	...	...	15.8
U.S.S.R.	...	...	...	...	24
Europe	...	...	...	...	8.8

This one-sided geographical distribution means that, of the existing production (and, as far as we know, of the geological stocks, too), the chief part lies in the U.S. and the U.S.S.R., and only a very small part in "colonial" areas. A not unimportant output is maintained, however, in non-imperialist sovereign overseas countries like the South American republics, Iran and Irak. The relationship between quantities of oil produced and the numbers of motor-cars and ships driven by oil or its derivatives is favourable (in the sense that there is a plentiful home supply) in the United States and in Soviet Russia. In all other countries which use these vehicles, for peaceful or "defence" purposes, on a large scale this relationship is thoroughly and unequally unfavourable. Italy, Germany and Japan are just as badly off as France, Belgium, Switzerland, Czechoslovakia, etc., though not worse off. And in this connection the quickly-growing importance of the consumption of oil and its derivatives by aeroplanes and dirigible balloons should not be forgotten.

Table B2 (3) gives world exports during the last business cycle. The effects of the cycle are reflected distinctly, though not with overwhelming strength, in the volume of traffic in raw petroleum, light fuel oil and lubricating oil. The table also illustrates in the large-scale decrease of the importation of lighting oil the very deep fall in the consumption of all imported

goods which took place in some "backward" countries. But the technical revolution in transport due to the Diesel engine has continued unchecked even during the slump. So we see the international trade in heavy fuel oils steadily increasing right throughout the business cycle.

The stocks of petroleum and processed products held by producers, which had increased in a dangerous way during the last boom, were diminished during the latter half of the depression and particularly during the recovery from 1933 to 1936. But prices for light oils, in terms of gold, continued to fall all the same. Price statistics for heavy fuel oils and for lubricating oils are not available in a comparable form. If we try to get a price index by dividing values by quantities as given in Table B2 (3) we obtain the following result :

TABLE T36.
PRICES OF HEAVY OILS, 1929-1935, IN RM PER TON.

	1929	1932	1933	1934	1935
Heavy fuel oil	35.2	21.3	21.3	20.5	
Lubricating oil	271	194	154		125

Thus not only did lubricating oil fall in gold value, but even in the case of heavy fuel oil the increase of consumption during the general slump could not check the ruinous fall of prices due to unbridled competition, nor could it improve prices in the first two years after recovery had set in. It is true that these figures refer only to those quantities which crossed frontiers in the form of heavy fuel oil, and not to heavy fuel oil made from raw oil in the country of consumption. But we have no reason to assume that the part we have taken is not a fair sample of the whole trade in fuel for Diesel and other heavy oil engines.

3.—*Asbestos.*

This material is important for some technical purposes. Like stone it is non-combustible, but it is flexible, consists of short fibres and may, in virtue of these qualities, be spun and woven or worked into a coarse kind of felt. Asbestos products provide materials destined to insulate against heat.

Our table is a combination of two tables taken from different sources, but the figures are fairly comparable. The enormous

drop in production in Canada was a consequence of the slump, since this latter brought about an extensive decrease in the installation of new factory plant, ships' machinery, locomotives and domestic central heating all the world over. The big increase of production in Russia is significant as showing

- (a) The rapid industrialization of that country ;
- (b) The large extent to which the Russian home market is independent of the business cycle experienced in the capitalist and pre-capitalist (" backward ") areas of the world.

As asbestos is useful for military purposes also, it is a distinct advantage in war-time if a country has its own supply. The distribution of existing production is extremely unequal. Only the small output of Cyprus comes clearly under the heading of " colonial " production, and, of course, Rhodesia is, according to our definition of colonies, a marginal case (see discussion of this point later on). No asbestos is found in Europe. Technically satisfactory substitutes can be found and produced artificially, though at a high cost only.

4.—*Salt.*

The table shows that production is fairly equally spread over the world. The three sources from which salt can be obtained are :

- (a) Salt mined from the subsoil ;
- (b) Salt gained from the water of salty inland lakes ;
- (c) Salt gained from sea water.

The number of countries where one at least of these three sources is inaccessible is extremely small. The fact that salt is not actually produced in all countries where such production would be possible is explained if we look at the price factor. Though salt is vital for human food and necessary for the feeding of fully domesticated live-stock and for many chemical purposes, the quantities used are not big and transport and production are cheap. As a result the price is low. There is, therefore, not much attraction towards the investment of large

sums in salt production as long as this commodity can be bought at the prevailing low international price.

The retail price is raised in many countries because of excise duties, or because of monopoly profits in connection with embargoes on importation or protective duties. The salt monopolies are nearly everywhere State monopolies.

5.—*Mineral Fertilizers.*

The importance of mineral fertilizers in maintaining the fertility of cultivated land and in making it more productive is becoming increasingly known throughout the world. The application of these substances has grown enormously since the end of the Great War, though at very different rates for the several minerals in question. The present level of agricultural production depends to a large extent on the regular and reasoned use of these substances. The non-organic materials at present added, by way of artificial manuring, to land under crops consist chiefly of lime, potash, phosphorus and/or nitrogen; whereas the development of agricultural research is now showing that small quantities of other substances, like iodine, manganese, etc., seem to be in a key position as regards the fertility of some widely-found soils and should, accordingly, be also systematically used. But the latter research is only beginning to give definite and practicable results, while the importance of the other substances has been firmly established by research and practice during scores of years.

Now the value and the natural distribution of these substances vary enormously. The most important is probably lime. But the occurrence of lime is so widespread throughout the world that international trade in it for the purpose of artificial fertilizing has scarcely developed. We may disregard it completely in our study, and the table which we give of mineral fertilizers contains no figures concerning it.

Next in importance as a fertilizing substance comes probably nitrogen. It is provided by nature in two forms, viz., in guano and in sodium nitrate compounds. Guano is an animal, semi-fossilized product, sodium nitrate is genuinely non-organic. These two substances are found only within a very limited area, viz., in the extremely dry border districts between Chile and Peru and on the islands opposite the Chilean and Peruvian

coast. The production of sodium nitrate was up to the last slump an extremely important one. In former centuries it was sought not so much for its value in agriculture, but as one of the basic substances of gunpowder—up to two score of years ago the most important explosive for civilian and military purposes. But gunpowder has passed its heyday since Nobel invented dynamite, and as a source of nitrogen for chemical and agricultural purposes sodium nitrate has found strong competitors, *e.g.*, guano, which became important seventy years ago, and a lot of artificial nitrate and ammonia compounds. These may be either by-products of chemical processes like the generation of gas from coal, or may be specially derived from processing the nitrogen content of the atmosphere, with the help of electricity, heat and high pressure. At the same time agriculture has learned, to a large extent, to achieve the nitrogen fertilization of the soil by more organic methods like cultivating and ploughing-under leguminous plants, etc. So we find a very distinct decrease, nearly a disappearance, of sodium nitrate from Chilean exports, particularly during the depression; while the exportation of nitrogenous manure in the form of guano has increased remarkably.

On the whole the importance of both these substances as sources of nitrogen for industrial and agricultural purposes is on the wane. Ammonia compounds, compounds of nitric acid, cyanides and organic manures take their places proportionally more and more. As these are not all raw materials in the strict sense, the nitrogen problem is disappearing quickly from the ranks of the raw material problems.

A similar position exists in regard to phosphorus. There is the same competition between natural phosphorus compounds and those which are the by-product of iron production. Many iron ores, particularly those with a low content of metal, contain admixtures of phosphoric compounds which are obtained as "basic slag" when the ores are melted down with limestone and coke. But here we have a different type of distribution of production if we look at it geographically. It is widely spread and divided among countries producing basic slag and countries mining natural lodes of phosphates. The first group coincides with the few European countries where we have a large iron industry and the U.S.; the second consists

of some regions in Europe, Africa and Oceania, many of these being colonial regions.

In Table B5 (1) we have, in addition, a column "super-phosphates". These are not raw materials in a strict sense and are not a net addition to the other forms in which phosphates turn up in that table. They are the results of processing "raw" phosphates so as to make them best suitable for agricultural and gardening purposes.

The situation as to phosphorus is that there does not now exist any international control of total production. And in the case of war a quantity sufficient to maintain the existing rate of fertility of the soil, as far as phosphorus is concerned, seems assured only to a very few important countries like Germany (provided she can go on importing iron ores from French Lorraine), France, the U.S., the U.S.S.R., Belgium, Luxemburg and, to a certain extent, Great Britain. For other countries (particularly Italy, Poland, Japan) supply in case of war depends entirely on uninterrupted importation either of the raw materials or of the processed superphosphates.

The last type of geographical distribution is given by potash. Here we have a semi-monopolistic type of supply. Nature supplies potash compounds which can be used commercially only in comparatively few places. Up to the Great War Germany had practically a monopoly of the production. Even in 1934, after the havoc the slump brought about in the German potash-mining industry, Germany produced about 1,200 of the 1,900 units of potash produced throughout the world. Of the rest more than half came from the Alsatian potash mines which Germany lost to France in 1919. So it seems that between them these two countries possess practically a world monopoly. They behave absolutely like monopolists, show a high degree of concentration in their capital and have shared out world consumption between them.

But they behave like cautious and prudent monopolists ; in fixing their scale of prices they do not exploit to the full the possibilities of their present position. In the background loom not only the minor existing outputs in Spain, Poland and the U.S., which might be stimulated to violent (though for a time expensive) expansion ; new productions might also arise in many places at any moment should the price policy of the

monopolists make it profitable for entrepreneurs to invest in such enterprises for producing potash and to put money into propaganda for protective duties in favour of such new enterprises. The figures of our table show us that the existing countries outside the monopoly did not suffer (as France and Germany did) as producers of potash, from the slump, but were able either to hold their own (Poland) or to increase production at the expense of the monopolists.

In the case of interruption of supplies by war it would probably be only a question of time and money before quite a number of new producing countries would appear on the world's markets. We know already for certain that Palestine (with the waters of the Dead Sea) and Russia are potential large-scale producers, and if the economic spurs of high prices or Government subventions are strongly applied in case of a political catastrophe, it might become profitable even to use that ubiquitous potential source of potash compounds, the sea. So far the latter has not been exploited because it is so hopelessly more expensive to undertake extraction from this source than to buy potash from Germany or France, both of which have, so far, offered the potash compounds rather cheaply all over the world.¹³

6.—*Sulphur.*

Sulphur and several sulphurous compounds are vitally necessary basic substances for the chemical industries; they rank in this respect with coal and nitrogen. Sulphur as a raw material is produced in two forms chiefly: brimstone, and sulphur as a constituent of iron pyrites.^{13a} The production of brimstone accounts for a quarter to a third of world production. It is practically all produced in Italy, Japan and (chiefly) the U.S.

The production of sulphur compounds from pyrites and other ores is more widespread, the pyrites and other ores being largely imported into the processing countries. We have, therefore,

¹³ Some widely-found rocks contain potash in quantities worth mentioning. They have not been used for the production of potash because such production is very expensive. But again price may become a minor consideration in case of war.

^{13a} Some copper ores, when heated, also yield sulphuric compounds as by-products.

limited our statistical table to those quantities of sulphur which are produced from ores mined in the several sulphur-producing countries themselves. This gives us a picture of a fairly widely distributed production, the United Kingdom, Poland, India and China only, among the great powers, being missing from our list (though the very primitive state of the chemical industries in the two last-named countries makes the fact unimportant to them for the time being). The three big so-called "Have-Nots", viz., Germany, Italy and Japan, are particularly well off, as Table B6 (2) shows.

The figures of Table B6 (1) reflect a deep fall of production during the slump and a prompt recovery the moment the favourable phase of the business cycle began.

7.—*Minor Non-Metallic Minerals.*

Graphite is important as a material for some chemical and metallurgical processes. Chief producers are two "Have-Not" nations, viz., Germany and Japan.

Mica comes chiefly from the other group of countries, the "Haves": Russia, the U.S., India, and Canada.

Silicious earth (diatomæ earth) is a necessary raw material for the fabrication of some explosives (dynamite is silicious earth soaked with nitro-glycerine). Among the "Haves", France (with Algeria) and Great Britain, and among the "Have-Nots" Japan are conspicuous as producers.

C.—VEGETABLE AND ANIMAL RAW MATERIALS.

1.—*Cereals, including Wheat Flour and Rice.*

I.—The Production of Cereals in Important Countries (Tables (a) to (d)).

Statistics of wheat production lack completeness, and figures published from authoritative sources for the year n in the year $n+1$ or $n+2$ may be any number of times altered again in the years $n+x$, x being >2 , not to speak of the differences in the figures gleaned from different, though equally "authoritative", sources. The estimates by many countries of the size of the harvest are often made by the following method:

(a) In spring the area sown is estimated by local experts in

their local districts, and these estimates are added up centrally.

- (b) Round about harvest time or shortly afterwards (taking into regard results of "sample threshing") the same or another set of experts report their estimates of the average yields per unit of area harvested. These are multiplied by the area formerly reported to have been sown, and the results added up centrally into an estimated total for the country.

This is, obviously, an extremely hazardous procedure. The only reliable method would be to introduce a double legal obligation on every producer of an agricultural product, the results to be calculated centrally, namely :

- (a) The obligation to report to a definite authority at a definite time the size of the area sown or planted, and
- (b) The obligation to report in the same way the quantity of the harvest, with a further legal obligation
- (c) To report all important later changes.

But very few countries provide for anything of that sort. Some control of the results of the slipshod methods now generally used is possible, in a number of important cases, from figures supplied by co-operative organizations, by mills or other processing factories, by port authorities, etc. These checks are the sources of the later corrections in official records of which we have already spoken. These are probably necessary, but are, all the same, a great source of confusion.

So we find that in most cases it is difficult to know with any accuracy what the harvest in any country of a certain crop in a certain year has been. But to add up these figures, as they are published year by year, for all the countries of the world is another extremely hazardous procedure. Harvests occur at very different times of the calendar year. Some governments report quickly, some extremely slowly, some always, and others in some years do not report at all. Some statistics are at least not wilfully and deliberately faked, other governments are highly suspected of "beautifying" or otherwise manipulating

their figures so as to adapt them to their political or propaganda purposes. War-time figures are particularly unreliable.

It is, therefore, not astonishing that our Table C1 I(a), in spite of its size, leaves numerous questions of high importance unanswered.

The year 1933 gives us the following percentages as the shares of the five traditional continents in the world harvest of wheat of that year :

TABLE T37.

PERCENTAGE DISTRIBUTION OF WHEAT PRODUCTION BY CONTINENTS, 1933.

In per cent. of World Harvest							
Europe	...	...	57.4	America	...	...	24.3
Asia	...	...	11.8	Australia	...	...	3.8 ¹⁴
Africa	...	...	2.5				

¹⁴ .2 per cent. has, I am afraid, got lost while I was calculating the percentages.

This shows Europe in a very strong position. But is it actually true ? And is it a passing phase, or a permanent feature ? If one looks through the figures for Russia, Italy, France, Germany and some of the minor countries not appearing separately in our table, if one thinks of all the endeavours we have heard of to achieve national self-sufficiency, the *battaglia del grano*, etc., it seems that wheat might indeed become less and less a commodity in the production of which some countries specialize. The same development which bred strains of wheat able to ripen farther to the north than formerly in Canada and farther to the south in the Argentine is bound to overcome difficulties of the length of the season of growth, of excessive heat, of lack of rains, etc., in other countries also. But the harvests in Europe of 1932 and 1933 were particularly and abnormally high ; the harvests of 1934 to 1936 have been much smaller, and, quite contrary to the expectations of most authors, politicians, business people, agriculturists and economists two years ago, we find at the time of writing (January, 1937) that the Canadian Wheat Pool is able to unload all its stocks carried over from former years at more than reasonable prices. A dollar a bushel seemed a beautiful dream to many a farmer in Saskatchewan in 1935 ; one and a half dollars a bushel is the price now actually within immediate reach for all the old stuff remaining from former years on which he and his " co-op."

and his government just avoided going bankrupt. It was a hair-breadth escape, but escape they did.^{14a}

The table for rye is really more complete than it looks, since the rye production of Russian Asia is included in that of Europe, and countries in America other than the U.S. are not great producers.

For barley and oats the following table for 1933 can be given :

TABLE T38.

DISTRIBUTION OF PRODUCTION OF BARLEY AND OATS BY CONTINENTS, 1933.

	In 1,000 Metric Tons.	
	Barley.	Oats.
Europe (including the whole of the U.S.S.R.) ...	24,755	43,548
Asia	7,190	435
Africa	2,350	264
America	5,890	16,370
Australia	16	60
WORLD TOTALS	40,380	61,030

This enables us to give a comprehensive table of the production of grains, by continents, again in 1,000 metric tons, for the year of the European bumper crop of 1933. This is Table C1 I (e) of the Appendix. In this world table we have simply added up the figures for the several sorts of grains, though it is certainly going rather far to assume that wheat, rye, rice, etc., have a common caloric denominator. But we do not usually bother about the fact that all of these grains serve partly as human food, partly for fodder, partly for making alcohol, etc., and that "wheat" covers, in the same year and from year to year, things very different in quality. So we may perhaps be allowed for a moment to sin again in this manner. The result, as with most deliberate and conscious sinning, is very interesting and shows us things quite beyond the limits of possible error, if we take the liberty of increasing the figures for Asia and for the world by something like 20 million tons. This we must do because the figures for rice in Asia are certainly much too low (see Table C1 I (d), which gives the world rice harvest in 1933

^{14a} While reading the proofs (September, 1937) I find that even the wave of war danger could not prevent a serious new slump in the wheat price. Spot wheat is quoted at Chicago now at something like \$1.25 per bushel. This shows how awkward a business forecasting on this field is!

58 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

as 90,087 units, though this neglects the U.S.S.R., Iran, Irak and as important a country as China). We get then :

TABLE T39.

COMPARISON OF GRAIN HARVESTS AND POPULATIONS, BY CONTINENTS, 1933.

	Population in Millions.	Harvest of grains in mill. tons.	Percentage of world totals.	
			Population.	Grains.
Europe	516	215	25	43
Asia	1,135	131	55	26.5
Africa	147	14	7	2.8
America	261	132	12.5	26.6
Australia	10	5	.5	1
WORLD TOTALS	2,069	496	100	99.9

Even if we think of the unreckoned primitive¹⁵ starchy foods and fodders consumed in large parts of Asia, Africa and America, such as millet, sweet potatoes and manioc, these omissions from our table will certainly be more than compensated by the consumption, for satisfying the basic human requirements of starch, of such a primitive food as the ordinary or "Irish" potato.

Potatoes are mostly consumed in the countries where they are grown. In 1933 Europe harvested 187 million metric tons of potatoes, America 13 million, the rest of the world together only 3.3 million ! It is very remarkable that Europe, in spite of its enormously favourable proportion of starchy food to population (.41 tons per head, without potatoes, etc.) is an importer of grain, whereas America, with little more than the same proportion (.51 tons per head) is a large-scale exporter.^{15a}

¹⁵ And do not let us forget that they are, after all, primitive.

^{15a} That this tendency on the part of some countries on the European Continent towards self-sufficiency in foodstuffs and fodders is not of purely recent date is shown by the following table :

TABLE T39a.—SHARE OF SOME COUNTRIES IN WORLD TRADE IN CERTAIN FOODSTUFFS AND FODDERS.

(In Per Cent. of World Totals, 1913 and 1924)

	Grains for				Animal Products.		Sugar.	
	Bread.		Fodder.		1913.	1924.	1913.	1924.
	1913.	1924.	1913.	1924.				
Great Britain	11.8	13.8	11.8	15.4	33.6	30.6	17.9	12.2
U.S.	8	14.6	4.5	5	8.6	8.7	18.3	25.8
Germany	8.6	4	14.6	5.6	7.3	7.2	9.9	2.8
France... ..	3.1	3.2	3.4	3.1	2.9	3.2	3	4

II.—*International Trade in Grain (Tables II (a) to (c))*

The tendency in a number of European countries towards self-sufficiency in cereals, which we have already seen at work in their growing grain production, finds expression even more clearly in the statistics of international trade in cereals. If we add these up, as they appear in Table (a) for the period 1929 to 1935, including this time for the sake of completeness wheat flour (the only flour for which international trade is of any importance) we find :

TABLE T40.
WORLD EXPORTS OF CEREALS, 1929-1935.

	In million metric tons						
	1929	1930	1931	1932	1933	1934	1935
Total exports of grains and flour	44	41·8	49·5	43·2	39·9	38·3	31·1 ¹

¹ Without rice ; average 1929-1934 ; 71 ; this would bring the figure for 1935 to 38·2

The impression given by this table is deepened and further clarified when we study Table (b). Here we see that the tendency towards much smaller imports of grains and flour shows itself distinctly in countries like Germany, Italy and, to a lesser extent, France ; while Great Britain shows a slight movement in the opposite direction. A very remarkable thing is the tendency towards a shrinkage of the exports of the U.S.

Our Table (d) for rice demonstrates conclusively that the Japanese Empire was well on the road to self-sufficiency in this fundamental food before it undertook the conquest of Manchuria and before it found itself under the necessity of providing food for the population of its conquest. The fact that in 1934 (Table (c)) British Malaya was able to export more rice than she imported was probably due only to temporary factors, though a general tendency towards self-sufficiency is here, too, clear enough.

III.—*Prices (Tables (a) to (d))*

Some of the price-falls during the last slump were remarkably large. The recovery which has taken place in agriculture in England and the U.S. since these countries went off gold is not

revealed by a study of prices when these are quoted in *Reichsmark* (i.e., in terms of gold) ; I have therefore quoted the prices for wheat per bushel in cents and per hundredweight in shillings and pence in footnotes. Despite the introduction of protective measures after the Ottawa Conference, prices in shillings continued to fall in London throughout 1934. Now, however, (January, 1937) wheat is on the up-grade all the world over.^{15b} The prices for wheat, rye and oats in Berlin show the remarkably steadying influence of German protectionism on agriculture. The relative price-falls down to 1934 were, in per cent., of the highest prices for the different countries in the several commodity series :

TABLE T₄₁.

, FALLS IN GRAIN PRICES IN GERMANY, POLAND AND THE ARGENTINE.

Rye.		Oats.	
Germany.	Poland.	Germany.	Buenos Aires.
38	64	28	75

The fall in the price of rice was particularly great and must have injured the cultivators of rice in India terribly. The slump deprived them of half their exports of rice and of more than half the value of these exports. Let us compare the following figures :

TABLE T₄₂.

DECLINE IN INDIAN RICE EXPORTS, 1929-34.

	1929	1932	1934
Net quantity exported, million tons	2.4	2.2	1.1
Price per ton, RM.	218	103.90	62.30
Money yield of exports, RM. millions	523	229	69
Loss against 1929 RM. millions		294	454

Whoever looks for an explanation as to why India had to export so much gold from the hoards of her small cultivators will find it in these four lines !

^{15b} On March 9th, 1937, the following prices were quoted on the New York Commodity Exchanges (figures in brackets are those of the previous year) :—Wheat No. 2, red, per bushel \$1.54 7/8 ; corn No. 2, yellow, per bushel \$1.26 ; copper, electrolytic, per lb. \$.1625 (.0925) ; lead, per lb. \$.0725 (.0460) ; tin, Straits Settlements, per lb. \$.60 (.4835) ; rubber, smoked sheets, per lb. \$.2263 (.1581). The boom is in full swing ! How long will it be before it will pay to use regenerated rubber ?—But see note 14a.

IV.—Visible Stocks

The imperfection of this table, as explained in the appropriate footnote, is so grave that it is scarcely possible to draw any important conclusions from the figures. No statistics of world stocks of rice are, unfortunately, available.

The daily and periodical press is full of so-called statistics of the fluctuations in grain stocks, but the figures are generally more or less clever guesses and subject to much, and mostly well-founded, criticism. This is the reason why I have not drawn on these sources for the purpose of filling the gaps left by the table I am giving here. In recent years the reliable material has shown a very welcome tendency towards a greater degree of completeness.

2.—Sugar.

We are excluding a number of foodstuffs from this review, but we have to include sugar, as the most important representative of the group of sweetening substances.

Sugar is only rarely offered to mankind freely by the kindness of nature requiring no more than the pains of collecting it, as, *e.g.*, in honey, in the juice of the American maple tree, etc. Honey was for a long time the only source of sweetening in Europe, and the inhabitants of that continent managed with sugar from this source for a long time. In the same way maple sugar was more important than cane sugar in colonial times in the North American territories though here the production of cane sugar was going on in the West Indies right under their noses. The old Colonial System of Great Britain looked to that.

A new phase in the indulgence of the human race's "sweet tooth" came with the growing cultivation of particular plants for the sake of their sugar content. This development coincided with the time when the experience that "sugar feeds" found theoretical approval in the scientific discovery that sugar is only one of a large group of carbohydrate nourishing materials among which starch is the most important. Sugar is as good as starch (in cereals, maize, potatoes, manioc, rice, etc.) in providing the human and animal body with physical energy. It is similar to these starch foods in being one of the sources for the production of alcohol by fermentation. Sugar has only to

be extracted from the vegetable substance in which it is harvested and purified ("refined") in order to be fit for human and animal consumption. In this second phase, which still obtains, sugar is chiefly produced from either sugar cane or sugar beet.

A third phase in the history of sugar production seems to be just now beginning; namely, the manufacture of sugar by chemical processes from vegetable materials in which it does not appear as sugar, particularly from wood pulp. But though it is quite possible that this development may suddenly change the whole aspect of the situation, it is not as yet important for the existing problems of the international distribution of this raw material.

The consumption of sugar for the production of alcohol is probably slightly on the decrease. The consumption of sugar for feeding animals and for the nourishment and enjoyment of human beings has increased enormously during the last fifty years or so, but it is still increasing very quickly. Not only is *per capita* consumption in the industrialized countries of the world rising, but a rapid intrusion is also being made into the daily consumption of the four large-scale population centres which have had, so far, a rather low *per capita* consumption, viz., China, India, Indonesia and Negro Africa.¹⁶

We give in Table (10) some figures relating to the domestic consumption of sugar which show us the effects of the slump on this "semi-luxury" or "mass-luxury" food. The decrease in consumption was remarkably small. The figures for France and Germany show that the period of decrease was very quickly followed by a new increase directly the upward trend of the business cycle began. Great Britain with her enormous *per capita* consumption proved more sensitive. But on the other side of the ocean the United States, with an even higher *per capita* consumption, showed a positive increase. So we cannot say much more, on the strength of the scanty statistical materials available, than that the chief brunt of the slump in the sugar industry must have been borne by the industry itself

¹⁶ The following figures and explanations are obsolete in regard to India where, with the recent introduction of a high protective duty on sugar, the growing of sugar-cane and the production and refining of sugar has begun on a large scale. The development is so recent that figures are not yet available.

in the form of decreasing prices and disappearing profits and not by the consumer by way of restricting his use of this commodity.

This, however, is not quite borne out by our Table (6) which shows the decline in the volume of sugar transported across international borders continuing even into the new upward phase of the business cycle. And this in spite of the fact that the drop in sugar prices has been absolutely catastrophic. It has been large even in the United States with their protective duty. But though prices were cut down by nearly three-quarters in Czechoslovakia, this could not prevent a decrease of about three-fifths in the quantity exported. In the United Kingdom the protection of home-grown sugar was not calculated to improve the price of imported Java sugar, though the cheapness of this latter did help to keep the quantity imported on the rather high pre-slump level.

Vigorous international limitation of production (of which we will say more later) set in during the slump and brought the total world production from its peak of 28.3 million metric tons in 1930-31 down to as little as 22.9 in 1932-33, allowing only for a small increase again in the following two post-slump years. The ensuing decrease of stocks was distinctly beneficial to the producer by preventing an even deeper fall in prices. But the restriction of production did not enhance prices, and so we may safely conclude that limitation of production in this case has, so far, not been paid for by the consumer. He got, during the slump, his sugar "dirt cheap"---at least in so far as the tax-collector did not charge him with heavy duties and excises, as was done, in fact, in many countries.

Sugar statistics are somewhat confusing because the production of sugar cane and of sugar beet is mostly carried on in two separate regions which communicate only in a few consuming areas. The U.S. is, I think, the only country where sugar cane and sugar beet are produced within the same political frontiers, and there most of the cane produced is not used for making sugar. Also the two regions of production in the U.S. are small and remote from one another. The last few decades have seen far-reaching changes in the relative importance of beet sugar and cane sugar. There were times when early rationalization and, in the cases of Russia and Czechoslovakia,

extremely low wages, gave beet sugar a fillip.¹⁷ But since that time the cheap wages have disappeared from Europe and rationalization has begun to make strong headway in the tropics, too ; and so cane sugar is again clearly advancing. If we pick out four years for comparison, we find :

TABLE T43.
PERCENTAGE SHARES OF BEET AND CANE IN TOTAL SUGAR PRODUCTION.

	Beet Sugar.	Cane Sugar.
	Per cent.	
1912/13	43	57
1930/31	42	58
1934/35	41	59
1935/36	39	61

Politically three of the great powers (Germany, Russia, France) are at least self-sufficient, and do not depend on international traffic in war-time, but not so Great Britain, the U.S., Italy (which allowed her production of sugar beet to disappear during the slump) and Japan. Germany, Russia, Poland and France are well provided for. The chief problem in peace-time is (and has been for the last fifty years) not how to secure sugar for the customer countries but how to organize such an international policy of production that a marketing crisis like the last one becomes impossible.

3.—*Rubber.*

Rubber is one of the new substances the large-scale use of which is characteristic of the technology of everyday life in modern countries. The tyre revolutionized road transport, and experience with internal combustion motors in motor-cars opened the way to flying. In other directions the use of rubber on a large scale seems likely in the future : for making paper which is water-resistant, for laying pavements and floors, etc. One of the uses of enormous economic importance, which should not be forgotten in even so sketchy a review as this, is that of providing important and efficient means for birth control. Though in this respect rubber is probably already becoming obsolescent, the change of mentality of a wide public towards birth control is due to the use of rubber, not of chemicals, and

¹⁷ We refer later to the system of sugar export subsidies and its partial stopping by the Brussels sugar convention.

birth control may well be considered as a revolutionary feature of our time. The aggregate quantity of rubber going into this use is, of course, very small. On the whole we may say: though the use of rubber was increased manifold during the first 37 years of this century, we may be sure that its use will go on increasing at an enormous rate in the near future.

Rubber is produced by tapping the bark of certain tropical plants which used to be found growing wild in the forests of Brazil, the Congo and other more or less unexplored parts of the tropical world. The collection of the rubber from these wild trees was a powerful factor in tropical colonization up to about 1900. But the present century found enterprising capitalists and planters trying to cultivate some of the most productive species. Cultivation in many parts of colonial Africa was tried but did not prove particularly successful. In the long run the best combination of soil, humidity, heat, labour and reliability of climate was found in the Malayan Peninsula, in the Dutch East Indian Islands, in Ceylon and in parts of India.

It seems, furthermore, that hopeful experiments, with the help of sufficient capital to undertake them on a large scale, are going on in Liberia (West Africa, Firestone concession) and in Brazil (Ford concession), though results of positive value have not so far become known.^{17a} This does not mean, however, that success there is impossible. The whole thing must be treated as an open question. If one or both of these enterprises should prove successful, the political aspect of the existing distribution of the production of rubber would change with about the same completeness with which it changed between 1910 and 1920 when the collection of wild African and South American rubber died out and the plantations and peasant farms of South-eastern Asia took their place.

^{17a} Mr. J. C. Lawrence, in his book (see Bibliography, No. 23a), gives a short history of the American quest for countries outside those in the Stevenson plan in which to grow rubber cheaply for the needs of the American tyre industry. It was pursued in Brazil and in Liberia, though the drop in prices after the breakdown of the Stevenson scheme has, so far, prevented things from developing very far in both countries. Mr. Lawrence prints also the relevant documents referring to the Stevenson scheme. From these it is clear that Sir James Stevenson saw quite well at the beginning that it would be dangerous if the rubber producers, actual and potential, of the Dutch Indies remained outsiders, so that he at first advised that the plan should be dropped. Why he later reversed his position and thought a slight and not very significant revision of the planned sliding scale of export duties on rubber a sufficient safeguard is not clear from perusing these documents.

World production increased in the period 1913 to 1934 by about 800 per cent. The price dropped, at the same time, measured in terms of gold, by more than 90 per cent. The stocks held in April, 1935, were equal to more than six times the total production of 1913. The productivity of the existing plantations has grown at such a rate that even the fantastic increase of consumption has been unable to keep pace with it. The plantations are either large-scale enterprises, owned mostly by European capitalist joint-stock companies, or small-scale native holdings of a peasant character. The first employ brigades of wage-workers, often recruited over long distances; the second tap their trees chiefly with the labour available (and mostly otherwise useless) in the peasant owners' families. Bad prices damage the interests of the companies more than those of the peasants.

Two recent periods of high prices have led to a rush of capital into the cultivation of rubber trees; first the high prices brought about by the war with its unexpectedly high consumption of rubber, later the first plan for "stabilizing" rubber prices on a "reasonable" level, the Stevenson Scheme. The former rubber boom brought a violent extension of capitalist plantations, the second a scarcely less violent extension of peasant cultivation.

The Stevenson Scheme did not include the Dutch East Indies. It will ever be one of the great enigmas of economic history how any official or semi-official authority could have taken on the responsibility for such a rash and, as the slightest acquaintance with economic theory should have taught, hopeless undertaking. However, we are obliged to those responsible for one of the most clear and instructive experiments modern economic history can boast of and can use. The plan limited production in the British South-eastern Asiatic territories so efficiently that prices rocketed sky-high instead of climbing to a moderate level profitable to entrepreneurs but not intolerably extortionate, and therefore not provocative to large-scale consumers. High prices, as so often happened in colonial history, proved a mighty incentive to native cultivation and the natives of the Dutch East Indies went increasingly into rubber. When their rubber-tree gardens began to produce rubber, world production, in spite of its thoroughgoing limitation in the areas covered by the

INTERNATIONALLY INTERESTING RAW MATERIALS

Stevenson Scheme, began to increase, prices to fall, and stocks to accumulate.

The Stevenson Scheme was brought to an abrupt end in 1928. For a time the drop in prices was able to check a further increase of production. The slump, therefore, found its corollary in a fairly stable production of rubber between 1929 and 1933. But the disappearance of the Stevenson Scheme had provoked new planting in many plantations ; in 1934 these trees began to bear, production suddenly jumped upward, stocks rose further, and a new scheme of limitation of output was introduced, this time (a) covering the whole South-eastern Asiatic area, and (b) limiting production only cautiously, so as to avoid sudden sensational jumps in prices which might favour the intrusion of outsiders elsewhere and annoy the consuming industries.

Prices, in terms of gold, showed an increase of 75 per cent. from the average of 1933 to that of 1934 ; but measured absolutely rubber is still extremely cheap, and even in the near future a further high increase in prices seems unlikely. The managers of the new scheme have learned the bald truth of the saying that you may kill the goose if you induce it to lay too many golden eggs.

In 1913, when the cultivation of rubber trees was in its infancy, the proportionate quantities produced in British Malaya and in the Dutch Indies respectively were something like 33 to 5. The limitation of production in the British areas under the first Stevenson plan brought the production of both territories to equality in 1924, though the production capacity was much higher in the British areas, where output was restricted, than in the Dutch area, where it was unrestricted. The next figures in our Table (3) signify, up to 1929, increased tapping of existing trees in the British area and the tapping of increasing numbers of maturing trees in the Dutch area. Though production in the British area is still superior the ratio was in 1934 much less in its favour than in 1913, viz., 'only 6½ to 5.

Control of production led, in the first Stevenson scheme, to the suicide of the controlling organization by provoking the growth of a formidable group of outsiders ; it deeply angered the consumers by causing a period of absolutely exploitative prices. The leaders of the second scheme seem to have learned

INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

the wisdom necessary for the successful handling of even the most convenient monopoly.

It must be stressed here that there was no differentiation in prices against any country or group of countries. But since, with the high concentration of the world's motor-cars in the U.S. and the use of rubber in the motor-car industry, the U.S. was the chief importer, the high prices were severely felt there and were used for propaganda of a typical "Have-Not" character. The poor little man in the U.S. exploited by the powerful and ruthless British and Dutch plantation capitalist ! This is a glaring example of such complaints. The U.S., one of the richest and easily the most many-sided producer of raw materials in this world, complaining passionately because it had to bear in a small way what it imposes on others in so many cases !

For the whole production of rubber, as shown in Table (1a), we find the following distribution :

TABLE T44.
DISTRIBUTION OF RUBBER PRODUCTION BY CONTINENTS, 1925 TO 1934.

						In 1,000 Metric Tons.	
						1925	1934
Africa	...	...	...	...	...	8	3
America	...	...	...	...	...	35	9
Areas of collection of wild rubber						43	12
Asia and Oceania	...	...	...	...	...	491	1,019
Colonial	...	...	...	...	...	483	992
Non-colonial	...	...	...	...	...	51	39
TOTALS	...	...	...	...	...	534	1,031

This table requires some explanations and slight qualifications. "Colonial" includes Ceylon and the whole of Africa ; "non-colonial" includes India and the whole of America. There is some small cultivation of rubber in Africa and America (*e.g.*, Liberia, Tanganyika Territory), and a certain, though inconsiderable, amount of wild rubber is collected in Asia and Oceania. The colonies in question belong chiefly to the British and Dutch Empire, with the French coming in as a rather subordinate third.

4.—*Timber.*

Our series of tables requires a number of explanations. The source from which they are taken is the German *Statistisches Jahrbuch für das Deutsche Reich*. This does not distinguish between "hard" and "soft" woods, but between *Laubholz* (wood-bearing leaves) and *Nadelholz* (conifers); the divisions are not quite identical. For practical reasons I have translated in the following way:

Laubrundholz—hard wood, unsawn.

Nadelrundholz—soft wood, unsawn.

Laubschnittholz—hard wood, sawn.

Nadelschnittholz—soft wood, sawn.

To avoid unnecessary length in the tables I have excluded (with a few exceptions which seem to me appropriate) all those countries the figures for which were so small over the period treated that no one entry would have been as big as 100,000 tons. The table gives us a clear idea of the widespread distribution of timber production for export, and of the use of imported timber. International statistics of forests and of total production and consumption of timber are scarcely available, at least not of a quality which gives us a right to rely on them. In some cases we are sure that exports can be only a small proportion of production (*e.g.*, the U.S.) or that they must be a very large proportion of it (*e.g.*, Finland); in others we know that imports can supply only a small part of total consumption; in the cases of other countries which are, as we know, very poor in forests, imports are bound to cover a comparatively large part of total consumption, *e.g.*, in the United Kingdom. But there is no purpose to be served by covering pages and pages with further statistics for sundry countries, as the gaps in these statistics would be so wide and the differences in unit measurement (the measuring being done here by weight, here by volume, here by square measure, here by running units of length like board-feet) are so fundamental that we should only get an enormous heap of scarcely comparable data.

Some countries depend for their supply or sales of timber in war-time very much on the freedom of international transport; this is obvious. In some cases this dependence may become vital in a future war, as it was during the Great War, when

Great Britain experienced difficulty in regard to supplies of pitprops and pulpwood and Germany as to pulpwood for newsprint. But technical progress may provide substitutes made from other materials for pitprops (steel, concrete) or even newsprint (milk).

5.—*Wood Pulp.*

As we have seen already, the production of wood pulp depends, in many cases, on the importation of wood. We may combine, *e.g.*, for the year 1933 the following table :

TABLE T45.
IMPORTATION OF PULP WOOD INTO CERTAIN COUNTRIES, 1933.

	In 1,000 Metric Tons.		
	Imports of Wood for Pulp and Paper.	Exports	Production of Wood Pulp.
Germany... ..	2,472	—	2,703
Sweden	23	19	2,563
Finland	—	475	1,479
Canada	33	1,416	2,703
U.S.	1,571	23	3,898

This table shows the various degrees to which the production of wood pulp is dependent on importation of the raw material, the extremes being for independence of imports Finland in Europe and Canada in America and for dependence on imports for their supplies of raw material Germany in Europe and the U.S. in America.

Wood pulp is the raw material not only for paper and cardboard, but also for the production of many kinds of artificial silk (rayon). In war-time it is important as raw material for some explosives (nitro-cellulose), which in peace-time are produced from waste cotton fibres.

6.—*Oil Seeds.*

Among all the raw foodstuffs there are very few instances where a large number of countries are vitally dependent upon supply from foreign producers, although many countries are interested in producing these foods totally or partly for exportation. Wheat, *e.g.*, is only imported in quantities large in proportion to domestic production in a few cases, though in quite a number even of these countries importation has shown

a rapid tendency to decrease in proportion to home production. In peace-time, with the long-term glut of production, there is scarcely any problem at all, and in war-time the problem is much more one of transport than one of production ; and this we shall discuss later.

Other " foodstuffs " playing an important part in international commerce are things like coffee, tea and cocoa, and we should do well to include tobacco with this group. The commodities of this sort are definitely " mass luxuries ". Their consumption has become a highly-cherished part of the usual standard of life of the consuming masses in industrialized countries, and even in some others, but experience has shown that demand is very elastic and adapts itself easily to increasing or decreasing prices by comparatively large variations in aggregate (and, therefore, individual) consumption.

There are two important exceptions : sugar and fats. We have treated sugar above. As to edible fats (and fats for industrial use) we cannot cover the whole field, if we limit ourselves to fats in the strict sense. Fats are bought and sold internationally only partly in the form of foodstuffs ready for consumption, like butter or lard. A not unimportant part of the international exchange consists of raw fats which require further processing before they can be consumed, as, *e.g.*, whale-oil. Another important, probably the most important, group of fats entering international commerce is bought and sold in the form of vegetable raw materials. We more or less neglect animal fats in our tables with the exception of whale-oil, because no comparable international statistics are available. The international range of the commerce in fats is shown by the following table :

TABLE T₄₆.
WORLD EXPORTS OF FATS.

						In 1,000 Metric tons.	
						1929	1933
1.	Butter	...	...	...	...	515	568
2.	Pig's lard, goose-fat, and similar fats	...	...	...	...	434	320
3.	Raw tallow, molten tallow, refined tallow	...	...	...	...	185	175
4.	Olive oil	...	...	...	...	190	208
5.	Palm oil	...	...	...	...	238	339
6.	Cocoa butter	...	...	...	...	19	18
7.	Margarine and similar edible fats	...	...	...	...	87	23
8.	Fats and oils from sea animals	...	...	...	...	198	180

In butter no less than approximately four-fifths of the world's total exports went to Great Britain in 1933. The importation of all other countries taken together does not amount to very much. A scarcity of butter is often created locally by the endeavours of certain governments to keep the price low without their being able or willing to increase the supply by importation. But as long as other fats are plentiful such a shortage is rather of political than of economic importance. This is not so when the scarcity of butter is only the expression of a general shortage of fats in a country's provision of food. In such cases a shortage of this sort should be taken as a very serious sign ; it is then only the most spectacular case of a general shortage of one of the most important foodstuffs and shows that something is seriously wrong.

Palm oil, palm-kernel oil and margarine are chiefly produced from oil seeds, to which we will now turn our attention. For the purpose of producing oil from oil seeds the seeds are mostly crushed and pressed, hot or cold, with or without the addition of water or under the effect of steam. There remains the non-fatty and non-watery substance of the fruit, and in all cases vegetative fibres (cellulose) and proteins, salts, etc. Most of these proteins are not yet used for human food,¹⁸ but are valuable for feeding livestock. Much of the feeding of cattle and pigs depends on the use of these substances, which are generally called oil cake. Oil seeds are, therefore, economically joint-supply raw materials, producing both fat and protein fodders.

Unfortunately, it is impossible to strike a statistical balance of the whole international trade in oil seeds, as these differ considerably in fat and protein content, and are, accordingly, quite incommensurable. So we must limit ourselves to giving separate statistical tables for each of the most important.

As to the importance of the colonial and non-colonial areas our tables may be combined into the following one :

¹⁸ The exception is the soya bean, the protein content of which is already widely used for human food. Some oil seeds or oil cakes, like, *e g*, those of cotton, are used in some parts of the world as manure ; but they scarcely enter into international trade if destined for such a use. Palm oil and palm-kernel oil are important in the tin-plate industry.

TABLE T47.

COLONIAL AND NON-COLONIAL PRODUCTION OF OIL SEEDS.

Percentages of Weight of Oil Seeds Entering International Trade.

Year	1933/4	1933	1933	1933	1932/3	1933-1934			1933	1933/4
	cotton seed	copra	ground nuts	soya beans	sesa-mum	hemp seed	rape seed	lin-seed	palm oil	olive oil
Colonial... ..	21	100	86	12	20			13	99	12
Non-colonial ...	79		14	88	80	100	100	87	1	8

The qualifications as to the completeness of our figures given in the notes accompanying our tables must not be forgotten. They largely concern the lack of complete figures for China, which makes the non-colonial part of our figures come out much too low in some important cases (cotton seed, ground nuts, soya beans, etc.). The table above is therefore an over-statement of the importance of the present share of the colonial territories in the whole production of oil seeds. The production of butter, whale-oil and lard is practically all non-colonial, as far as these goods enter into international commerce.

It may be interesting to note the following example of the unreliability of all statistics in such international comparisons. The figures concerning oil seeds have been compiled from the various volumes of the *International Statistical Year Book* published by the League of Nations. They, again, rely chiefly on publications and communications of the International Institute for Agriculture in Rome. If one goes into the figures more closely one finds that data for the same year for the same country vary considerably from volume to volume of the year book. The figures, *e.g.*, for the production of cotton seed for the U.S.S.R., show the following amounts :

TABLE T48.

PRODUCTION OF COTTON SEED IN RUSSIA.

In 1,000 q.									
For the year	1925	1926	1927	1928	1929	1930	1931	1932	1933
Year Book 1931/32	3,955	3,787	4,813	5,500	5,998	6,812			
Year Book 1933/34	3,560	3,560	4,750	5,420	5,700	7,350	8,500	8,400	9,500
Year Book 1934/35	<i>id.</i>	<i>id.</i>	<i>id.</i>	5,410	5,670	7,330	8,510	8,380	8,910

This engenders an entirely wholesome scepticism in regard to these figures. The differences are, of course, not the fault of the League of Nations or of the Rome Institute. It is difficult to reach fairly complete and ascertained figures for the whole world. In the tables of the Appendix I have always taken the latest figure printed in the League of Nations' Year Book.

In 1916 an export duty on palm kernels of £2 per ton was enacted to cover only kernels not exported to any part of the British Empire. It was put into force in 1919 and repealed in 1922. As the case is of comparatively recent date and very exceptional in kind it is worth mentioning. The experience was obviously unsatisfactory, which explains the early repeal of the measure.

7.—*Cotton.*

The types of cotton grown and used are very numerous. We have distinguished in our tables only the American, Indian and Egyptian types, grouping all the rest under "others". The reader should pay attention to whether the text uses the expression "American cotton" or "cotton from America". The first expression is a definition of quality, the second one of geographical provenance. Not all cotton from America is "American cotton" according to our terminology, nor does all "American cotton" come from America. This is a little confusing, it is true; but I did not think it my task, or even right, to discard the internationally accepted terminology and to build up one of my own.

Of the three large groups Egyptian cotton is generally considered to be the finest, Indian the least valuable, and American to come between the two. Among "others" we find the quite superior "Sea Island" as well as the very coarse and short-fibred "native" cottons of the interior of Africa, etc., so that as to quality the "others" are not a uniform group.

The second half of the Table (1b) gives us the proportion of the shares in total production of the four chief producing countries. The sudden increase of the share of "others" has been chiefly due to the rapid growth of Brazilian production and of that of China and the Anglo-Egyptian Sudan. The figures for China are :

TABLE T49.
COTTON PRODUCTION IN CHINA, 1927-1934.

In 1,000 q.						
1927-1931, annual average	...	...	...	...	...	4,638
1932	...	...	...	...	...	4,900
1933	...	...	...	...	...	5,909
1934	...	...	...	...	...	6,754

The order of importance of producing countries according to quantity produced was in 1934 :

TABLE T50.
ORDER OF IMPORTANCE OF CHIEF COTTON-PRODUCING COUNTRIES, 1934.

United States of America.
India.
China.
Russia.
Egypt.
Brazil.

It is quite possible that Brazil will overtake Egypt in the near future.

The drop in the absolute amount and in the proportion of world production supplied by the U.S. is chiefly the consequence of the government policy of limitation of production for the purpose of buttressing prices. Pressure as well as subvention was brought into play to ensure this feature of the New Deal. How long this state of things will hold depends on political developments on the U.S. as well as on the future price level of cotton. At the low prices prevailing during the last few years a revival of cotton cultivation to former production level in the south of the U.S. with its exhausted and eroded soils seems scarcely probable, except through the occasional occurrence of a bumper crop.^{18a}

The figures mentioned in the second part of Table (3) are found by conversion of bales into metric weight. The figures are, however, only roughly correct, as the actual weight

^{18a} While correcting the proofs I find that such a bumper crop has occurred this year. The official estimate of the U.S. harvest of cotton runs now (September, 1937) at 16½ million bales, and in spite of a Government guarantee of 12c per lb. the spot price oscillates now around 9.5c. per lb. only. Crop control does not exist at the moment; it was destroyed by a decision of the Supreme Court of the U.S. Government plans to re-introduce it for the year 1938, but it is more than doubtful whether a form will be found which enables such federal legislation to withstand the tests of constitutionality applied by the Supreme Court

per bale is far from being uniform ; the figure for " others " is a poor makeshift. It is quite possible that the totals for 1913 and 1934 (4,856 and 5,082) may be too small or too large by something like 10 per cent. This qualification concerns all quantities of cotton given by us in metric weight.

Table (4) shows that the policy of limiting production (which has been applied only in a few producing countries, the most important being the U.S.) has not been unsuccessful. The peak in stocks was reached in 1932 with 2,087,000 tons, and at the end of June, 1935, they were at the level of only 1,134,000, the decrease being 953,000 tons. The decrease of stocks of American cotton, during the same time, was 950,000 tons, so that the improvement of the situation was almost entirely an achievement of the U.S. policy. The misery created in the cotton belt of the U.S. by this policy has been terrible.^{18b}

Table (5) shows the incongruity of the geographical distributions of consumption and production—a fact which has always characterized the cotton industry and which was even more marked in former times. The fact that this incongruity is of very old standing is rather significant. Many of the spindles in the " old " spinning countries, it may be remarked, lead, entirely or partly, only a statistical existence. Fifteen per cent. would be a very conservative estimate of these superfluous spindles for Germany and the United Kingdom. This would bring Germany down from fourth to seventh place or so and Great Britain much nearer to the U.S. The U.S. have written off and resolutely thrown onto the scrap-heap most of their obsolete spindles ; Germany and Great Britain have scarcely begun to do so.

Table (6) shows that the policy of improving prices by means of limitation of production of raw cotton has been successful, to some extent, in the U.S. The rest of the world shows nothing of the kind.¹⁹

In a separate table we sketch the development in Russia. It shows many interesting details and foretells a great future

^{18b} Stocks were slightly higher again in June, 1936, because the governmental control of production in the U.S. began to lose its efficiency.

¹⁹ The figures would have shown, of course, a different tendency if we had quoted them in paper currency units. But though gold, as a measure of value, is certainly not very stable, its " elasticity " is much less than that of paper currencies.

for the production of raw cotton and the exportation of cotton goods from that country.

Table (8) allows us to compute the proportion of colonial in the total production as being only 1·2 per cent. Though the table applies to the annual average of the pre-slump period, this percentage should be fairly correct still, as the decrease of production in the U.S. will have been made up for by increases in other non-colonial countries like Russia, Brazil and China.²⁰ This figure shows that the international distribution of raw cotton, whatever other considerations it may involve, is, in any case, not a colonial problem.

8.—*Minor Textile Fibres : Flax, Hemp, Silk, Jute.*

The importance of these fibres for the consuming countries consists chiefly in the fact that employment (and profits) in certain large industries depend on their being supplied freely. Like cotton (and even wool) these fibres suffer from the competition of yarns made from artificially-manufactured fibres. With the exception of silk their production is very highly concentrated geographically, the most remarkable case being that of jute, where only a part of the Indian province of Bengal supplies the whole world. There is a distinct tendency for more and more of the Bengal-grown jute to be processed on the spot.

9.—*Wool.*

Wool is one of the most important textile raw materials. It serves not only for clothes, underclothes and swimming suits, but for carpets and rugs, etc. In the form of felt it is widely used in industry.

The chief source of wool is the hair of sheep. The distribution of sheep over the world is very unequal. The following are the most notable sheep-rearing countries ; the figures are those of the last census taken in 1930 or later ; the years are not exactly the same for all countries.

²⁰ The increase of production in China shown by our tables may be in part only the result of more complete data having been collected in recent years ; this is quite probable ; but it is quite impossible to measure the inaccuracy on this account.

TABLE T51.

SHEEP POPULATION IN RELATION TO HUMAN POPULATION, BY COUNTRIES.

	Human population in million.	Sheep population in million.	Sheep per head of human population.
Germany	66.6	3.5	.05
Bulgaria	6.1	8.7	1.4
France	41.9	9.6	.2
Greece	6.6	7.4	1.1
Great Britain	46.7	26.7	.6
Irish Free State	3	3.4	1.1
Italy	42.6	10.3	.2
Jugoslavia	14.2	8.9	.6
Portugal	7.1	3.7	.5
Rumania	18.8	12.3	.7
U.S.S.R. (including goats) ...	165.7	50.6	.3
Spain	24.2	16.5	.7
Canada	10.7	3.4	.3
U.S.	126.4	49.8	.4
Mexico	16.6	3.7	.2
Argentina	11.8	44.4	3.8
Brazil	45.3	10.7	.2
Chile	4.4	6.3	1.4
Peru	6.1	11.2	1.8
Uruguay	1.9	15.4	8.1
India	360	43.5	.1
Turkey	13.6	10.7	.8
Union of S. Africa	8.5	48.4	5.7
Algeria	6.6	5.8	.9
French Morocco	5.4	8.6	1.6
Tunisia	2.4	3.1	1.3
Australia	6.6	112.9	17
New Zealand	1.6	29	18

In absolute figures we find the following countries leading :

In Europe :

The U.S.S.R. with	50.6 million.
The U.K. with	26.7 "
Spain with	16.5 "
Rumania with	12.3 "
Italy with	10.3 "

Outside of Europe :

Australia with	112.9 million.
The U.S. with	49.8 "
The Union of S. Africa	48.4 "
Argentina with	44.4 "
India with	43.5 "

whereas the incidence of sheep per head of the human population shows the following ranges :

In Europe :

Highest	Bulgaria	1.4
.	Greece, Irish Free	
.	State	1.1
.	.	
.	.	
.	.	
.	U.S.S.R.	.3
.	France, Italy	.2
Lowest	Germany	.05

Outside of Europe :

Highest	New Zealand	18
.	Australia	17
.	.	
.	.	
.	.	
.	.	
.	.	
.	Mexico, Brazil	.2
Lowest	India	.1

Table (1) shows the fairly wide distribution of the production of wool, but if taken in conjunction with Table (6) shows also the incongruity of the production of raw wool and of its use in the textile industries in the several countries. Wool spinning and weaving still scarcely exists in colonial territories on an industrial scale, and of the whole supply of wool only 7.4 per cent. is provided by colonial countries. So this again is not a colonial problem at all.

The glut of wool was considerable during the slump up to 1932, but although stocks continued to increase for two years prices recovered to a remarkable extent, and 1935 brought a sudden and dramatic drop in stocks. Probably the universal putting of official and party armies into uniforms had much to do with this. It is quite possible that a distinct shortage of wool may develop. This would favour the further development of substitutes, which has, so far, given only poor results (chiefly in Germany and Italy).

10.—*Artificial Silk (Rayon).*

This section is given as a supplement to the tables on "natural" fibres. It shows that artificial silk production developed with fantastic speed all through the slump, though at the cost of very low prices, which enabled rayon to make considerable inroads into the former markets for cotton, linen, silk and recently even wool (Germany!). The chief raw materials for the production of artificial silk are wood and, far behind as the second in the race, raw cotton.²¹ The development of good qualities in artificial yarns, chiefly durability and resistance to hot soapy water, is probably only in its infancy. If we compare the world production of the chief competitors, cotton and rayon, we find:

TABLE T52.

COMPARISON OF TOTAL PRODUCTION OF COTTON AND RAYON, 1912-1934.

In Metric Tons.

Cotton, 1913/4 :	5 7 mill.	1934 : 5 mill.
Rayon, 1912 :	9,000.	1934 : 414,000.

So we shall see, in all probability, in the near future the raw material problem of the textile industry gradually ceasing to

²¹ To a large extent inferior grades of cotton and cotton waste, though as to the latter rayon has now found a strong competitor in the production of nitro-cellulose for explosives.

be a problem of cotton and becoming, to a large extent, one of pulp wood, shavings and even sawdust.

D.—APPENDIX.

II.—*Electrical Energy.*

Our table does the best we can do in the way of affording statistical data which are better than nothing, though they are not strictly comparable from country to country nor always even from year to year within the same country.

It is impossible to give an estimate of a really valuable character of the possibilities, in the various countries, of developing the generation of electrical power. The electrical "Have-Nots" of to-day may quickly become the "Haves", by some fortunate stroke of technical invention, provided they have strong sunshine or a high oceanic tide or strong steady winds; and most of them have one or more of these vast potential power resources of the perhaps quite near future. In the case of electricity we can reason from what is, to what may be very soon, with less assurance than in the case of anything else we are discussing. After all the whole age of electricity, though it has existed scarcely half a century, has been technically as well as economically and politically one huge chain of fundamental surprises. It is not probable that it will lose this, its only steady characteristic, in the near future.

The state of development of water-power a short time ago is illustrated by Table (2), which is probably incomplete. Its greatest defect is that it gives the developed water-powers of Russia as only a few hundred thousand horse-power. This is certainly much too small an estimate.

It will readily be seen from the table that the "Have-Not" nations are far in advance of many others in the development of their water-power. Their territory (including colonies, Ethiopia and Manchuria) comprises 5·2 million square kilometres as against 9·4 million square kilometres of the U.S. (including Alaska), their population is 243 millions against 129 millions of the U.S. As their water-power resources are 69 per cent. of those developed in the U.S., their area 56 per cent. of the size of the U.S. and their population 188 per cent. of that of the U.S., the first at least of these two gauges shows their position in a very favourable light.

CHAPTER II

THE FIELD OF OUR STUDY

§ I

RAW materials form a group of commodities containing hundreds of different things ; and if we take into account quality, *e.g.*, the proportion and accessibility of useful substance in the raw materials offered by nature, we have to extend the list still further. From the economic point of view what interests us most about iron ores, for instance, is, in most cases, the proportion of iron they contain. Now this proportion varies considerably according to the particular kind of iron ores. Within certain limits we may safely assume that the price of iron ore is proportional to its metallic content. For instance we find that in 1935 Germany imported 5·51 million metric tons of iron ore from Sweden and 5·83 million tons from France and Algeria ; for the former she paid 66·35 million RM., but for the latter only 31·20 million RM. The average prices per ton were, then, for the Swedish ore (with its high iron content) RM. 12·04 a ton and for the French ore (which has a rather low iron content) only RM. 5·35 a ton. Only by a liberal interpretation of the term “ iron ore ” is it possible to treat two sorts of ores of such different quality as one and the same commodity in our statistical researches.

We shall take this liberty, in order to keep our study within the limits necessarily imposed by space and readability. We can do so with a good conscience, for these differences are not always of really great relevance when looked at from the viewpoint of our study. However, they must certainly be taken into account in some cases. If, for instance, we speak of the satisfaction of the demand for rubber by either natural rubber, or by regenerated scrap rubber, or by synthetic rubber, we have, in certain discussions, to lay stress on the fact that the average duration of life for goods made from these different sorts of rubber may be very different. Their costs are very different also and depend on different causal factors.

The wages of native labour and the rate of interest prevailing

in Ceylon and Indonesia have a large influence on the price of natural rubber, while European and American wages and rates of interest, the cost of establishing high-pressure apparatus and the rate of its wear and tear are the chief items in the cost of synthetic rubber, etc. In the case of regenerated rubber costs of production are made up in a totally different way, payment for scrap rubber appearing here as a new item which, of course, we did not find in the case of natural and of synthetic rubber.

But though this is important when we discuss the problem of substitution prices, it is, in other directions, quite irrelevant. We can, *e.g.*, say: "Britain is able to supply herself with rubber from her possessions in Malaya and Ceylon; the U.S. can satisfy its wants to a large extent by regenerating scrap rubber; Germany could make all the rubber she needs for army purposes in the factories of the *I.G. Farbenindustrie*"—if price and durability are minor points of interest. If, *e.g.*, a country's situation in war or its need for self-sufficiency, involuntary or self-chosen, is to be discussed. We have, therefore, sometimes to take into consideration differences like those mentioned in this particular example, and at other times we may safely neglect them.

§ 2

Many raw materials, by their very nature, satisfy widely-varying wants: by providing us with more than one material for the further processing activities of industry, or by being usable in different ways. Some copper ores, when they are smelted and refined, deliver silver as a by-product.

The oak tree gives acorns for feeding pigs¹ and wonderful timber. In the one case we must leave it standing, in the other we have to cut it down. In some parts of Silesia the leaves of oak trees are systematically picked while they are still green, to make up for a deficiency of hay and straw. In these districts the bare trees, which have served and are still serving as "air-pasture" (*Luftweide*), may be seen on all sides. When they are felled after many years of use in this way the wood of these trees is only good for firewood.

¹ The suitability of acorns for feeding pigs very cheaply was one of the chief economic causes of the Great War, namely, of the long-standing jealousy between the Serbian and Hungarian agriculturists.

Wheat provides us not only with corn, but also with straw. From rye flour we may make bread, or paste for sticking papers on the walls of our houses. Iron is equally necessary for the bayonet of the soldier and the knife of the surgeon.

Where a material in its natural state is a compound of widely differing useful substances, it is generally necessary, first of all, to process it in order to separate the ingredients. Its compound character is not generally, therefore, a source of ambiguity in statistics, because we simply use the statistics of the raw materials resulting from the splitting-up of the compound.

But where a number of different commodities can be used for the same purpose the case is different. Many technical purposes can be achieved by a large assortment of materials, and nearly every substance serves a wide range of purposes. This possibility of multiple substitution leads to serious difficulties when we try to find out which raw materials are important enough to be of interest to us in this study. Flax may be replaced by cotton, and cotton by artificial silk. So the pines of Germany are competitors not only of the flax of Russia but also of the cotton of Alabama. All this competition occurs in order to satisfy, say, the effort of the textile industries of Italy to supply the fashionable dressmaker in Paris working for well-to-do ladies in Mayfair. Hemp is indispensable as a reliable material for ropes for navigation ; but in most of its other uses it may be easily replaced by other fibres. Is, then, the one use in which it cannot be supplanted important enough to justify us in including it in our review ?

§ 3

Human life persists through the consumption of goods and services. O. Neurath has divided things consumed into five groups : food, clothing, dwelling, education and amusement. If we add as a sixth group public order (which certainly is, by its very nature, neither educative nor amusing) and transport as a seventh, this list covers indeed the whole field, provided that these terms are used in a wide sense. Are all these groups equally important from the viewpoint of our study ? Obviously not. Which, then, can we exclude ? Under " food " we find necessities, and also some things which nobody would believe to be vital in any sense to any number of people, though views on what are comparative superfluities change from time to

time and vary widely from place to place. Tea is to the Britisher what coffee is to the German and to the American. The requirements of dress vary according to climate (*cf.* those of the Indians and of the Eskimos) or change according to periods (four petticoats were a "moral" necessity in the Victorian age and seem unwearable now). The Japanese idea of a dwelling is thoroughly different from the French one, and at the same time so obstinately enduring that it seems that Japanese people can settle successfully only in districts where the climate allows them to establish the kind of houses they are accustomed to on their main island. The closest approach to a general world opinion as to what standards of consumption ought to be may probably be found in educational matters—though, on the other hand, the standards of existing educational practice vary more than those in any of the other fields of consumption. What, then, is necessary, vital, indispensable? And what is wonderful, nice, good, wholesome, superfluous, a distinct luxury, a pernicious luxury, a vice?

The greatest variety of opinions is to be found as to amusements; and in this sphere opinions change with particular speed. We all have lived through the development of the cinema and of the wireless from far-fetched snobbish luxuries to matters-of-course in the every-day life of at least one half of mankind. Twenty-five years ago it was possible to state seriously that the motor-car was useful for warfare and for ambulances but otherwise a public nuisance of the first order (in Mr. A. P. Herbert's *Uncommon Law* something of this feeling still distinctly survives). To-day the urbanization of the country, the country week-ends of many townspeople, the unveiling of huge unexplored or otherwise "backward" areas, and even the timely prevention of the terrors of local famine all depend on the automobile. Modern life in the U.S. without 25 million automobiles to deal with the enormous distances of the country would seem an impossibility. No young person there understands how life was at all "possible" before the internal combustion motor allowed 50 million people to flit about at will at the rate of 40 miles an hour. Flying also seemed at first important only for warfare. To-day we dust forests threatened with devastation by the nun moth with arsenic potash from aeroplanes; we discover and kill approach-

ing armies of tropical grasshoppers and caterpillars with the help of aviation, and so on. England transports all her letters between important centres by daily air mail.

Nearly equally uncertain are our ideas about what is necessary, what is pleasant, and what is obnoxious in the maintenance of public order. What a variety of ideas there are about the advantages and disadvantages of war, from some statesmen's panegyrics in favour of it to other politicians' bans upon it! What gauge of public order is common to Lord Baldwin, General Franco and Mr. Stalin?

Things seem to be rather chaotic, what with so many philosophies of life, so many hierarchies of values in consumption. Think of the ensuing variety of producers' goods needed for all these commodities for final consumption! We have, therefore, either to base our study on a purely individual choice as to what raw materials shall be included, or we have to try something which seems scarcely less arbitrary, but which is, nevertheless, rather more hopeful: let us take as a basis the existing consumption in kind and quantity; let us leave a loophole for certain probable developments; let us, finally, look at those raw materials which are used, or might be used in the near future, to maintain consumption at the present rate, and to increase it on account both of the probable increase of population and of urgent and widely called-for extensions of individual consumption of goods and services. These are the factors which we have, in fact, tried to make the basis of this study.

§ 4

I felt sorely tempted, for the sake of shortness, to exclude from our inquiry all raw materials used for feeding human beings, vegetable as well as animal. There is at least a *prima vista* case for doing so. In principle we have in their case three possible situations as regards production and sale: (a) equilibrium of production and consumption; (b) lagging of production behind actual consumption or, if this is deemed unduly low, behind what consumption should be; (c) surplus of production (or possible production) over consumption. Each of these situations exists in a number of countries; and where one or other of the two possible types of disequilibria obtains, we can really see no remedy for this state of things by

changing the distribution of productive resources. The allocation of more of the wheat area of the Argentine to Great Britain, *e.g.*, might take one of two possible forms: (a) the institution of political domination by Great Britain over the Argentine; or (b) the transplantation of an adequate proportion of the inhabitants of the British Isles to the Gran Chaco and Patagonia. Conquest or migration? We shall discuss these possibilities later.

In fact the volume of production of edible things varies widely from country to country, and this is true not only for foodstuffs as a whole but for individual foodstuffs. Great Britain and Germany are, *e.g.*, on the whole, large net importers of food (though these net imports, expressed in calories and in units of protein, form a very different proportion of the whole quantity actually consumed in each case). But Britain is not an exporter of a surplus of any important kind of food, though Germany is (or has been, in the recent past) in this position with regard to some foodstuffs. The German statistics of foreign trade show the following examples:

TABLE T53.
EXPORTS AND IMPORTS OF CERTAIN FOODSTUFFS; GERMANY, 1930-1935

	Year.	In Metric Tons. Imports	Exports.
Living pigs 	1930	23,554	26,994
	1931	8,743	21,202
	1932	2,456	5,171
	1933	2,444	3,767
	1934	3,446	990
	1935	11,211	14
Fresh potatoes	1930	319,933	99,898
	1931	118,515	494,650
	1932	125,538	202,087
	1933	71,220	34,262
	1934	111,829	38,676
	1935	60,172	17,083
Sugar 	1930	34,070	321,703
	1931	14,278	368,006
	1932	34,328	4,281
	1933	29,275	19,054
	1934	20,799	4,430
	1935	30,140	9,775
Rye 	1930	59,036	240,208
	1931	101,823	84,909
	1932	646,064	92,627
	1933	238,387	263,179
	1934	52,684	107,272
	1935	219,799	36,666

Do these figures show a clear tendency towards the definite disappearance of international trade in these foodstuffs? The changes shown by them may well lie completely within the range of the shrinkage in international trade during the last slump and depression. After all, the decline in turnover was enormous in nearly all fields of international commerce. Unfortunately, a comparison between the trade of different countries is made difficult by the fact that we have to use the common denominator of money as a gauge, though we know quite well that this is methodologically an awkward procedure. But if we want to soothe our statistical conscience (and we want it badly in this case) we can do so by making the helpful and not too improbable assumption that prices fell, on the whole and within certain limits, more or less proportionally to the volume in international trade; this restitutes our right to measure the volume of international trade during the last business cycle by money turnover. I take from the German Statistical Abstract for 1936 a series of figures which covers the exports of countries accounting for 99 per cent. of the world trade. Here we find the following series of indexes for world exports:

TABLE T54.

INDEX FIGURES OF INTERNATIONAL TRADE; EXPORTS ONLY; 1929=100.

Years.	Foodstuffs of animal vege- table		Total food- stuffs	Raw ma- terials.	Semi- pro- cessed ma- terials.	Finished goods.	Pro- vision- ally	Defi- nitely	World exports.
	origin.						Finished goods.		
1929 ...	100	100	100	100	100	100	100	100	100
1930 ...	89	79	82	74	78	82	78	85	80
1931 ...	67	59	61	49	53	59	57	60	57
1932 ...	44	44	44	34	35	38	39	37	38
1933 ...	38	37	37	36	34	34	36	32	35
1934 ...	33	34	34	37	33	33	34	32	34
1935 ...	34	35	34	37	34	33	33	33	34
1932 ...	117	117	117	87	90	95	100	95	97
1935 ...	97	100	97	106	97	94	94	94	97

It is astonishing how close together the figures are found to be again at the end of this period, as is shown by the first part of our table. The second part illustrates this even more clearly; here the median in each of the two years 1932 and 1935 is taken as equal to 100. The differences, wild enough

during the slump from 1929 to 1930 and in the first part of the ensuing depression, had already begun to subside quietly in 1932, when the bottom of the depression was reached and at least some recovery in some raw materials began. The next two years brought such an adjustment that in 1935 the deviation both ways from the median was only 6 per cent.—not a remarkable change from the 1929 levels after such wild convulsions of world economics. *Parturiunt montes*. . . .²

The following is the result of finding the index figures for the share of world exports taken by the different classes of commodities. Of the total value the following classes comprised :

TABLE T55.
PERCENTAGE SHARE OF CERTAIN CLASSES OF COMMODITIES IN INTERNATIONAL
TRADE, 1929-1934.

	Per Cent.		
	1929	1932.	1934.
Foodstuffs and beverages	23·2	27·3	23·3
Raw materials and semi-finished goods ...	34·8	31·8	36·4
Finished goods	41	40	39·5

Here again the difference between the state of things at the end of the period and the position in 1929 is not very important. Whereas in some groups quantities particularly declined, prices must have remained firmer, and *vice versa*.

One word more about our Table T53.

A country may be an exporter of some foodstuff in one year and an importer of it in another year. If these oscillations round zero point are only small in proportion to total home consumption (and production) and alternate fairly regularly, they are the natural expression of equilibrium between production and consumption which is never mathematically exact. If they are irregular, large in proportion to home consumption, or show a definite trend they cannot be taken as a sign of such equilibrium. In years of bumper crops a country whose trade shows these features will suffer from a serious glut, and in times of bad harvests it will be at the mercy of politics or foreign

² The great imperfection of these statistics is, of course, that they leave out of account the international exchange of services (transport of passengers and goods, etc.). There are no statistics available on the latter subject. It seems that the drop was smaller, *e.g.*, in the carrying of overseas freight and overseas mail, but greater in the carrying of passengers.

producers. Such cases indicate either an erratic disequilibrium (rye) or changing situation (pigs, potatoes, sugar).

When we divide the six years under observation into two periods of three years each and compute the annual averages, our table for Germany becomes as follows :

TABLE T56.
CHANGES IN THE FOREIGN TRADE IN SOME FOODSTUFFS ; GERMANY, 1930/32
AND 1933/35.

					In 1,000 Metric Tons.			
					Imports		Exports	
					First	Second	First	Second
					Period		Period.	
Living pigs ...	...	...	...	...	11 $\frac{2}{3}$	5 $\frac{2}{3}$	17 $\frac{2}{3}$	1 $\frac{2}{3}$
Fresh potatoes ...	...	...	...	...	188	81	265 $\frac{2}{3}$	30 $\frac{2}{3}$
Sugar ...	...	...	...	...	27 $\frac{2}{3}$	26 $\frac{2}{3}$	258	11
Rye ...	...	...	...	...	269	270 $\frac{1}{3}$	139 $\frac{1}{3}$	135 $\frac{2}{3}$

All these commodities are, therefore, characterized by large deviations from the general international trend. The importation of pigs shows a fairly typical behaviour, but not the exportation, the shrinkage here being particularly large.

Fresh potatoes again conform to the general international trend in importation, but exportation is fast disappearing.

Rye shows unusually small changes in both imports and exports ; and the volumes of both are not very important in proportion to the size of the production in Germany.

Sugar likewise shows a small variation in imports, but the flourishing export trade of former years has practically disappeared.

Now the example of Germany is important, because she is one of the countries where, in order to achieve self-sufficiency in foodstuffs, protection has been carried very far indeed ; but the result has been minimal and not clearly in the direction of fuller self-sufficiency. A trend towards greater self-sufficiency may have asserted itself for a few years, but 1932 was clearly a turning point, not only in unemployment but as regards self-sufficiency in foodstuffs, too. Increasing appetites following the increase in employment have put a stop to all hopes of self-sufficiency in foodstuffs without important curtailments of the food consumption per head of a fully-employed population.

§ 5

Refined sugar, though itself the result of processing activities, is always treated as a raw material, in analogy with the usual treatment of metals. The materials from which it is produced—sugar cane, sugar beet, liquid residue of the cellulose industry—are never exported, though parts of them provide useful fodder or fuel material for further processing activities.³ Just as we treat both ores and the metals produced from them up to the stage of refinement as raw materials for the purposes of these studies, so do we include both wheat and wheat flour in our list of commodities to be taken into consideration.

Among foodstuffs we exclude such things as oranges, lemons, dates, figs, grapefruits, bananas, tea, cocoa, coffee, tobacco from our study. But this is not because it is, at present, scarcely possible to grow them outside quite definite climates. This argument might no longer hold good after a comparatively short time. We have experienced great surprises in similar matters within recent years.

The invasion of the waste plains of Western Canada by wheat came within the lifetime of all those who survived service in the Great War. I have seen the generalization of tomato-growing in Germany, beginning with the culture of an expensive luxury in hot-houses forty years ago and developing into a common and extremely simple branch of suburban gardening. In both cases the breeding of new varieties led to developments of which nobody had even thought previously; the same is true of the cultivation of citrus fruits in Palestine, of sugar cane in large parts of India, of cocoa in the Gold Coast, of rubber trees in Malaya and Indonesia. There is nothing ridiculous in the supposition that it might prove possible to breed a new strain of banana which might ripen with reasonable certainty in Northern Italy, in the Channel Islands and in the Bergstrasse.

We exclude these things from our study for another reason :

³ The cellulose fibre of sugar-cane, bagasse, is now used for making "artificial" wood—boards and blocks—with valuable technical qualities (resistance to termites, low degree of conductivity for sound and heat). It has been therefore an important article of exportation in recent years. In the same way the empty wooden shells of coconuts, which are left over when the copra is cut out and which formerly were burnt as rubbish, have become a valuable material, because a kind of coal is made from them which is used as being the best gas-absorbent filling for certain types of gas masks.

they come under the heading of mass luxuries for the white population. For the same reason, and to save space and to avoid blurring the more important outlines, we will, furthermore, exclude all those raw materials which come under the headings education and amusement. What we do *not* exclude are those raw materials necessary for building or keeping up the productive apparatus of any kind, even if it also serves to produce food, education or amusement. So we find our first limitation. The series of statistical tables at the end of the book, which we have already discussed in the first chapter, provides us with the necessary data, as far as they are available and fairly reliable, concerning all these materials.

§ 6

As to the reliability of these statistics, we must note that the figures for production are often only estimates, and sometimes private ones, though we find these reprinted in official statistical annuals,⁴ etc., because data from more official sources are lacking. Where it is a question of telling us what mineral resources are waiting for exploitation, an estimate (which often enough is not much more than a crafty guess) is obviously the only possible way of knowing anything at all, and some of the results are of small reliability as, *e.g.*, the estimates of coal down to 6,600 feet below the surface, which we have mentioned already. Huge surprises, positive and negative, are quite possible here. A footnote to the table in the German source from which the estimates are quoted raises the estimate for Africa (and for the world) by another 168 thousand million tons. Something of the sound scepticism inspired by this adventure in coal statistics should be applied to all the statistical tables we are discussing here, though the case of coal seams is, perhaps, a rather spectacular one. The Table B2 (1) on geological stocks of oil is open, to a certain extent, to the same doubt, though the information on which it is based is more recent and probably better and more complete.

⁴ The best current collection of them is to be found in the German Statistical Year Book, in an international appendix of now nearly 300 pages which has been largely used in preparing this book. Other good sources, only partly overlapping with this and also largely used in compiling our data, are the Statistical Year Book of the League of Nations and the annual publication *The Mineral Industry of the British Empire and Foreign Countries*, published by the Imperial Institute in London.

CHAPTER III

STABILITY AND VARIABILITY IN THE "NATURAL" CONDITIONS OF PRODUCTION

§ I

CLIMATE is a fairly stable factor in human economic activities. We know of variations of local climate through time, but generally their range is known by experience, and the expectation of extreme (and particularly dangerous) variations is so well defined a probability that the community should be able to make some provision for them with a fair degree of certitude.¹ But for all that, climate is not an unchangeable factor. The natural changes are generally very slow (though in the Tacna-Arica district of Peru and Chile, where the normal

¹ To give an example: the *Indian Statistical Abstract*, 1919-20 to 1928-29, gives the following figures for what it calls the "normal" and the "actual" annual rainfall, in inches, in several subdivisions of India:

TABLE T56a.—NORMAL AND ACTUAL RAINFALL IN INDIA, 1919-1928.

		Inches.										
		"Nor- mal."	"Actual."									
			1919.	1920.	1921.	1922	1923.	1924.	1925	1926.	1927.	1928.
Madras, Malabar Bombay, Konkan Hyderabad, North		100·1	112·3	122·5	99	122	120	142·9	110	103·1	102·4	88·1
		109·6	109·6	77	108·4	107·6	112·3	98·5	93·5	121·7	107·9	120·1
		34·3	30·4	16·2	29·0	32·5	28·8	29·8	29·8	30·1	31·8	37·3

What a catastrophe the surplus of rain in Madras in 1924 must have been; what terrible droughts those of 1920 in the two other sub-divisions! But most of the deviations are within the limits of safety, in every one of these three sub-divisions only one in ten years was serious; certainly it should have been possible to insure against it, if that task had been undertaken seriously.

The extreme deviations from the "normal" figure are in these cases, expressed as percentages of the "normal" value:

Madras + 43, — 12, range 55 per cent. of "normal"
Bombay + 12, — 29, " 41 " " "
Hyderabad + 9, — 53, " 62 " " "

annual rainfall is less than one millimetre, the spell of wet years which some time ago melted part of the nitrates in the soil was as quick in coming as in disappearing). Adaptation to these slow changes is generally easy and goes on mostly rather automatically. It is so imperceptible that it often appears to the inhabitants simply as better adaptation of life and production to the peculiarities of the local climate.

More important than these natural changes are changes in climate caused by human activities, together with the consequences thereof. The devastation of forests has dried up whole provinces; and in many parts of Africa, in the cotton belt of the United States, etc., shifting cultivation brought about such a denudation of the soil that thousands of square miles of land were sterilized, large rivers silted up and huge swamps created. Afforestation and re-afforestation, if they are undertaken on a large scale and with untiring consistence, can stop, and even reverse, these pernicious developments. Irrigation and drainage are other ways of achieving similar beneficent aims.

There is still much scope for such dodging of climate by human intervention. In many cases the technique is already entirely or partly known, though often important points remain still to be cleared up. It is generally a question of planning and of deliberate diversion of large amounts of capital from other uses to these purposes.² The breeding of new species of domestic animals and useful plants, and the introduction of new methods of using the soil, like dry farming, have helped in the dodging of climate. The eradication of epidemic and endemic diseases, of predatory beasts, and the adaptation of the customs of human life to new climatic conditions have had just the same result. "Dodging the drawbacks of climate" has been one of the great chapters of human progress during the last two centuries, and should become an even greater one in the near future.

² The plan of Mr. Wallace, the present Secretary for Agriculture in the United States, to buy up 100 million acres of land used for farming, but unsuitable for it in the long run because of the lack of water, and the gradual re-afforestation of these lands, will be a marvellous achievement of this sort, provided that future U.S. governments will proceed with it without a break.

§ 2

The same is true as to soil. Man can influence it in a bad and in a good way. The fertile plains of Western and Central Europe and of the British Isles are not as nature originally offered them: they are the result of centuries of exploitation, often ruthless enough, and of re-fertilization, often, so far, imperfect enough. The original high fertility of the black soil of the Ukraine has dwindled to a mere shadow of what it used to be. But at Tel Aviv in Palestine we have seen wonderful gardens rise on land which twenty years ago consisted only of loose fine sand, entirely bare of any organic substance and blown hither and thither by every fresh breeze—all this achieved by patient fixing of the dunes and the application of green manure year after year. In many countries we see fertile humus being carried up to terraced, steep hillsides for gardening—in China as well as on the Canary Islands, on human shoulders as well as on mule-back. It is again a question of applying deliberately to these problems capital, labour and scientific knowledge or inherited experience. There was a king in Prussia who boasted that he had added a province to his country in peace—by draining swamps. The clearing of trees, bush and rocks; ploughing, manuring and the rotation of crops: all these change the soil from its uncouth natural state into something more civilized, more sophisticated. Enormous increases in production are the prize shared out among the nations concentrating their investments and endeavours on these works. The discovery of hidden mineral treasure in the soil comes under the same heading.

§ 3

A further "natural" factor in economic life is human labour. But it is even less constant than climate or soil. It varies and may be varied, in quantity and in quality. The variations are partly "Acts of God"—not always in the sense that they may not be foreseen, but in the sense that they "just happen". Epidemics and wars fulfil even the condition that they cannot be forecast; so do famines and other sudden inroads of mass-death into human society. But it is an old truth that after catastrophes of this sort populations restore themselves very

quickly. On the slopes of volcanoes people sometimes sow into the still warm ashes of the last eruption.

Practically more important, therefore, are slower changes, which, for all that, may be the outcome of some human activities. Few only of those who repealed the British corn laws in 1846 wanted to drive British and Irish rural youth overseas and into the big British towns and cities: but these two mass-migrations were the results of their legislation and created the dependence of the United Kingdom on unhampered importation of foodstuffs and raw materials together with the enormous industrial and agricultural growth of the United States of America. The propagandists of birth control, or at least some of them, only wanted to make the supply of human labour rather more scarce in England; many of them did not think of putting a brake on the increase of the population at all, but dreamt (and dream even to-day) only of a more reasonable "spreading-out" of the same number of births over a wider part of married women's lives. The married couples, however, in practising this new technique, thought only of their personal wishes, they "chose the baby-car in place of the baby". So they instigated the slowing-down of the increase of population; and to such an extent has it proceeded that it has become a factor of first-rate importance for the future British labour market.

Let us look at two examples of countries with serious "population problems".

Palestine is one of the few countries showing, during the last ten years, a permanent dearth of labour, chiefly of semi-skilled and skilled labour for the finishing industries, building, growing citrus fruit and rearing cattle. An enormous quantity of capital is brought into the country. Much of it is absorbed by the equally enormous increase of prices for rural and urban land. But much of it lies in the banks and awaits investment. The chief (though not the only) limiting factor to this is the shortage of labour.

We see just the contrary in India. The population has been increasing rapidly since 1920. It has increased during these 17 years by about 60 million or more. The country is chiefly agricultural, but the area under cultivation can extend only very slowly, and capital for the intensification of rural work

is lacking. Though in some parts two harvests per year, one in the wet and one in the dry season, are possible, generally much of the possible working time of the labourer is simply unused.³ In Europe the winter slackness of agricultural work is mitigated by work in connection with live-stock, forest work, etc. But winter work shrinks everywhere in India to the care of cattle and chickens, and for the majority of the population, the Hindoos, even this does not exist. Rural industry (*e.g.*, spinning and weaving) barely holds its own, in fact is probably decreasing. So India fills herself more and more with people fit for labour whose work is, at the present time, unwanted. In spite of this, population is growing with extreme speed.

The first beginnings of deliberate planning for an *optimum* density of population may be observed in many places: the qualitative, though chiefly negative, experiments in "race hygienics" in some states of the U.S. and in National Socialist Germany, and their quantitative corollaries, planning for limitation of increase (Canada, U.S., New Zealand, Palestine) and for enhancement of increase (Italy, Germany, France). We even see scientific research beginning on the subject of what an optimum population *is*; and in Australia⁴ the problem as to what is the maximum possible density of population for a country has been the subject of serious scientific inquiry.

On the qualitative side education generally, and professional education particularly, are age-old endeavours to make up for natural shortcomings in skill. The result of long discussions seems to be that we have no reason to assume that so-called "coloured people" have not the capacity for being educated into fitness for high-grade industrial work. Perfectibility of skill does not seem to be the privilege of one or two "races" only.⁵ Even the quantity of labour to be extracted from the individual is becoming gradually a subject of planned policy.

Obligatory labour service; limitation of working hours;

³ See R. K. Das, *The Industrial Efficiency of India*.

⁴ See the extremely interesting and in many ways elucidating discussion of this problem in the volume edited by Mr. P. D. Phillips and Mr. G. L. Wood, *The Peopling of Australia*, particularly the contribution by Mr. F. C. Benham, "The Optimum Size of Population," pp. 246 *seq.*

⁵ My professional experience as an instructor at a college for negro boys and girls bears out this view perfectly, in spite of all the handicaps, social, economic and psychic, under which the pupils are struggling. The same applies to my experience with Indian post-graduate students of economics in England.

progressive exclusion of children, young people and women from certain kinds of work or from work at all or at certain times ; the introduction of old-age pensions ; enforced retirement of public servants, judges and teachers : all these work towards the same end : to make the natural factor labour more and more plastic and to strip it more and more of the characteristics of superfluity, shortage or lack of qualification.

§ 4

What, then, is the outcome of all this ?

Certainly that our review assumes a very provisional character. What was true yesterday is, often enough, only a half-truth to-day and may be totally wrong to-morrow. For example, what increased importance wood, as a raw material, has gained from the invention of the cinema and of artificial silk ; rubber from the invention of the bicycle and of the motor-car ; milk from the use of galalith for electrical installation ; steel from railways, machinery, ferro-concrete building ; shellac from the gramophone !

And what is true of invention is no less true of discovery. Let us have a look at the statistics of copper production. The copper produced by refining from copper ores mined in the several countries has been as follows :

TABLE T57.
SHIFTING OF DISTRIBUTION OF COPPER PRODUCTION, 1913-1934.

In 1,000 Metric Tons.							
Year	Canada.	U.S.	Mexico.	Chile.	Northern Rhodesia.	Belgian Congo.	World.
1913 ...	13·9	555·4	43·7	20·2	nothing	7·5	1,018·5
1928 ...	56·6	828·2	45·3	274·9	6	112·5	1,695·1
1930 ...	101·6	632·5	56·4	208	6·4	140	1,577·3
1932 ...	95·1	231·8	35·1	247·7	69	58·9	922·2
1934 ...	151·9	215·9	47·1	247·7	140·1	110·1	1,273·2

These figures reveal an historical drama : First the discovery of new supplies of copper ore in Chile, with the consequent investment of huge sums of capital and the concentration of large numbers of miners in this area, depreciating much of the capital invested, and throwing out of employment many of the miners, in the copper mines of the United States. Second, the

opening of the copper mines in Katanga in the extreme south of the Belgian Congo, involving new investment and the roping in of new herds of negro workers—checking, in spite of increasing world consumption, the further growth of mining in Chile and deepening the gloomy outlook in the U.S. Third, we see once more entrepreneurs on the move, pouring their capital into Northern Rhodesia, developing new riches of ore there, attracting negroes from quite different parts of the Dark Continent, putting a check on the development of Katanga, and further depressing copper mining in the U.S., even during the years of quick world-wide recovery. What destruction of productive equipment and, worse even, what frustration of masses of human lives ! And all this in little more than twenty years. It is a clear illustration of how totally unexpected changes may cut into the web of our most carefully woven expectations as to the future of the supply of raw materials.

Chance, private individual endeavours, and planned achievements can scarcely be forecast with a fair degree of certainty. All that we say must, therefore, be understood with this enormously important qualification—that we make predictions to the best of our knowledge, but that we are fully prepared to see things go quite a different way from what we now believe to be their probable direction in the near future.

CHAPTER IV

THE EXISTING DISTRIBUTION OF RAW MATERIALS

A.—THE RAW MATERIAL RESOURCES OF THE MORE IMPORTANT COUNTRIES

I.—*Calculation of Index Figures of the Wealth in Raw Materials for 15 Countries.*

WE now begin to formulate explicitly the result of the masses of figures we have marshalled in our statistical tables. But before doing so I have to explain the methods on which the last table of our Appendix is based, and to deduce the inferences to which it leads. My endeavour was to try to find out if it is possible, with some real meaning, to measure the strength of the more important countries in terms of a series of comprehensive figures. Of course the argument can be raised that to do this is arbitrary and is, at the same time, something like adding up apples and pigs. All that is quite true, just as it is true that an examiner, by giving marks, inevitably violates realities to some extent, and that giving marks often enough means a wild, though respectable orgy of individualism. But in spite of all these well-founded doubts examinations will continue to be useful ; and as in politics the classification of nations under the heads of " Haves " and " Have-Nots " will be used again and again, it seemed worth while trying to bring at least some small amount of method and consistence into the study of these international problems. So I have worked out the following system of giving marks :

(1) For every one of the raw materials 10 marks were shared among the countries producing it, whether the country was mentioned in our table or not ; the proportion of the 10 marks

obtained by each producing country was equal to the proportion of the world supply of the raw material in question which the particular country contributed, so that a country contributing 10 per cent. of the world supply received 1 mark, etc. I avoided decimals and rounded off the figures to the next integer, according to the usual system, seeing to it, however, that no vertical column in the table ever showed a sum higher than 10.

(2) In so far as these marks fell to one of the 15 countries appearing in this table these marks were credited to them in Table A. Marks falling to countries not included in this table simply dropped out of our calculation, so that the sum of one vertical column may be (and very often is) less than 10, and may even be zero.

(3) Colonial resources were included in the wealth of the mother country. In the case of the U.K., the Dominions and India were treated as separate countries, so that "Great Britain" in this table means: England and Wales, Scotland, Northern Ireland, the Crown Colonies, Protectorates and Mandated Territories. Burma was treated as part of India; so were the territories of the Indian Princes. The Anglo-Egyptian Sudan was treated as a British colony. In the case of Italy, Ethiopia reckons as a colony (though that has scarcely any importance for our table), and in the case of Japan, Manchuria is treated as part of the Japanese Empire, just like Formosa, Korea, etc. The Philippine Islands are treated as a separate entity, not as colonies of the United States.

(4) This was the simpler part of the whole plan. The more difficult one was the process of weighting these marks. This was and is a very doubtful affair. The weighting of some raw materials depends entirely on whether a country is at peace or at war. Strontium is, only in peace-time, *e.g.*, important for fireworks for amusement purposes. This is so extremely subordinate a purpose that we would not have included this metal in our inquiry at all for this sake; the same is true in regard to the use of strontium compounds in the cane-sugar industry.

But in war-time strontium compounds may be very important, as they were from 1914 to 1918, because the strong red light which they produce when they are burned makes them a very valuable raw material for signalling-rockets. That is why we have included strontium in our inquiry and our table. But should peace-time or war-time importance serve as the basis of weighting?

After much hesitation I decided on the following system of weighting, the results of which I give for what they may seem worth to my readers—I feel very far from being cocksure in regard to this method. I found out, as nearly as possible, what proportion of the total value of world exports the value of the known exports of the material in question formed. This was expressed as a “weighting index” for that product, expressed in thousandth-parts of total world trade. In those cases where it was not possible to find such a figure (they are all cases of “minor” materials) *one*-thousandth was taken. The number of thousandths falling to every raw material in this way has been entered in the Appendix, in Table E, B in the form of integers.

(5) Part C of Table E contains the results obtained by multiplying the figures of Table A by the weighting indexes of Table B, and of adding up the horizontal lines of Table C.

(6) For obvious reasons iron ore, iron and steel were treated as separate items. This seemed to me the best way of evading the difficulty arising from the impossibility of obtaining figures showing the importance of scrap iron in the individual countries. For other metals the problem of scrap did not seem to me of sufficient importance to take particular notice of it in the weighting system. In the case of gold, however, where “scrap” is identical, more or less, with the gold imprisoned in the cellars of the banks, gold in banks and gold production were treated as separate items, the same weighting figure being taken for both.¹

¹ The tables of lodes of coal, iron and oil in the earth were not taken into consideration.

With this system of marking I reached the following results :

TABLE T58.

UNWEIGHTED AND WEIGHTED MARKS OF 15 COUNTRIES FOR WEALTH IN RAW MATERIALS.

Country.	Unweighted Marks.	Weighted Marks.	Percentage of Total Unweighted Marks.	Percentage of Total Weighted Marks.
Australia	11	75	2	3
Brazil	7	58	1	2
Canada	46	149	9	5
China	18	48	3	2
France	38	123	7	4
Germany	36	140	7	5
Great Britain	48	260	9	9
Holland	13	95	3	3
India	62	260	12	9
Italy	17	71	3	3
Japan	32	151	6	5
Poland	5	28	1	1
Russia	73	422	14	15
Union of South Africa	17	81	3	3
United States	112	894	22	32
	515	2,785		

Now let us compare these percentages with the population figures for the countries in question. The latest population figures, in millions, which are known, are :

TABLE T59.

WEIGHTED MARKS OF 15 COUNTRIES FOR WEALTH IN RAW MATERIALS, COMPARED WITH THEIR POPULATION.

Country	Population in Millions	In Per Cent. of sum of Previous Column.	Percentage of Total Weighted Marks. ¹
1. Australia	7	·4	3
2. Brazil	43	2·4	2
3. Canada	11	·6	5
4. China	444	25·3	2
5. France	106	6·5	4
6. Germany	67	3·8	5
7. Great Britain	104	5·9	9
8. Holland	69	3·9	3
9. India	380	21·7	9
10. Italy	54	3	3
11. Japan	129	7·4	5
12. Poland	32	2	1
13. Russia	170	9·7	15
14. Union of S. Africa	9	·5	3
15. United States	128	7·3	32
	1,753	100	

¹ Repeated from previous table.

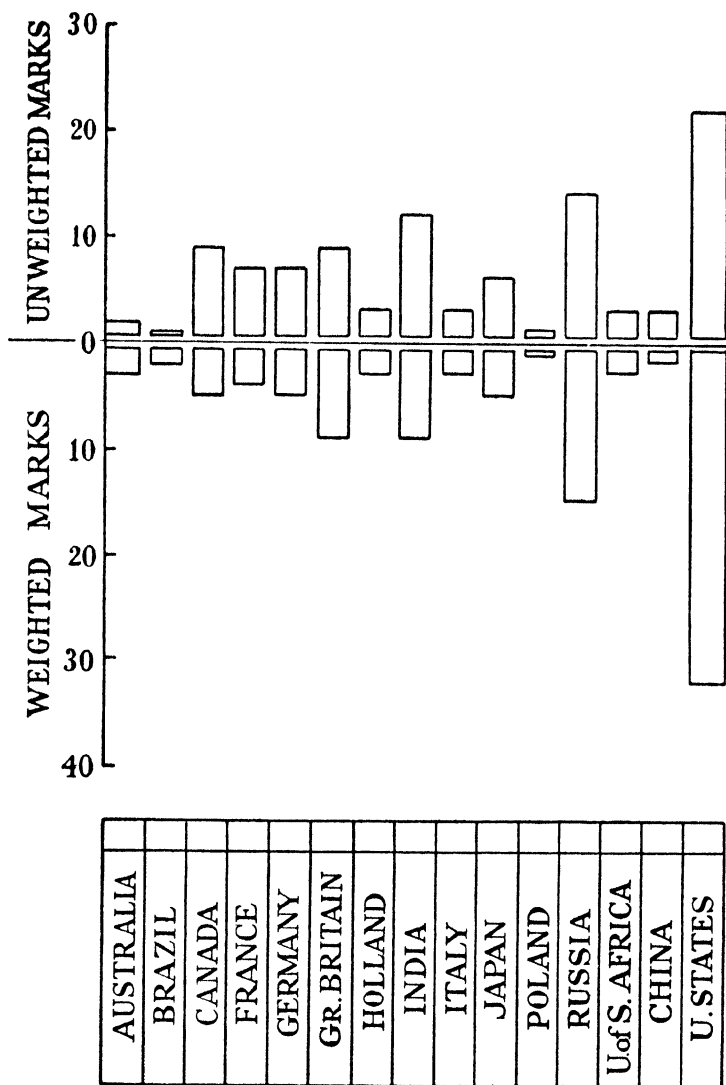


Figure 1 : Unweighted and Weighted Marks for 15 Countries. Their Wealth in Raw Materials. Marks for Wealth in Raw Materials in per cent. of Total Marks.

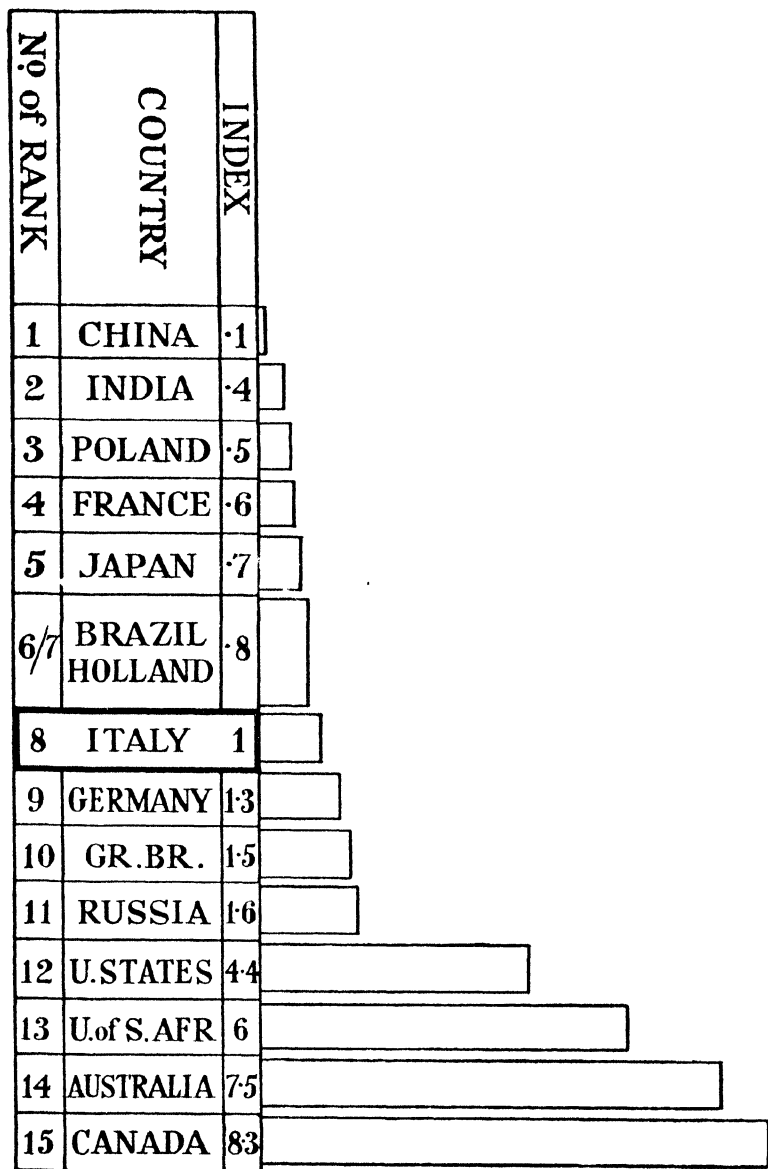


Figure 2 : Index Figures of Wealth in Raw Materials.

If we now divide the last column by the second, we get a figure showing how many times the share of raw materials of the particular country is larger or smaller than unity :

TABLE T60.
INDEX OF WEALTH IN RAW MATERIALS FOR 15 COUNTRIES.

Number of country in previous table ...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Index of wealth in raw materials ...	7.5	8	8.3	1	6	1.3	1.5	8	3	1	7	5	1.6	6	4.4

And this, as the final result of our long-winded and bothersome, risky, but not quite useless, statistical venture, gives us the following list :

TABLE T61.
RELATIVE IMPORTANCE OF 15 COUNTRIES ACCORDING TO THEIR WEALTH IN
RAW MATERIALS.

Rank.															Index of Wealth in Raw Materials.
	Poorest.														
1	China	...	...	...	...	...	...	...	...	...	...	...	...	...	1
2	India	...	...	...	...	...	...	...	...	...	...	...	...	...	4
3	Poland	...	...	...	...	...	...	...	...	...	...	...	...	...	5
4	France	...	...	...	...	...	...	...	...	...	...	...	...	...	6
5	Japan	...	...	...	...	...	...	...	...	...	...	...	...	...	7
6/7	Brazil, Holland	...	...	...	...	...	...	...	...	...	...	...	...	...	8
8	Italy	...	...	...	...	...	...	...	...	...	...	...	...	...	1
9	Germany	...	...	...	...	...	...	...	...	...	...	...	...	...	1.3
10	Great Britain	...	...	...	...	...	...	...	...	...	...	...	...	...	1.5
11	Russia	...	...	...	...	...	...	...	...	...	...	...	...	...	1.6
12	United States	...	...	...	...	...	...	...	...	...	...	...	...	...	4.4
13	Union of South Africa	...	...	...	...	...	...	...	...	...	...	...	...	...	6
14	Australia	...	...	...	...	...	...	...	...	...	...	...	...	...	7.5
15	Canada	...	...	...	...	...	...	...	...	...	...	...	...	...	8.3
	Richest.														

If we go over this table in a reflective mood its general result does not seem so great a surprise as one might have expected. It makes sense, though some weaknesses are obvious. Among the commodities produced on a large scale and of economic importance in the world are a few which would have influenced the result perceptibly as, *e.g.*, coffee in the case of Brazil, tea in the cases of China and India, cocoa in that of Great Britain, tobacco in the cases of Brazil, Holland and the U.S. ; meat, butter and cheese would have still further raised the already

very high indexes for Australia and New Zealand. China with her extremely low place in this table is obviously to a certain degree the victim of the fact that most of her production, though it certainly reaches her 444 million consumers, does not reach statistical tables. The Italian index is *lowered*, unduly, as some will think, by our inclusion of ten million Ethiopians in her population percentage and therefore in the denominator of the fraction determining the value of the index of raw material wealth. Skins and hides, milk, transport services and potatoes are other gaps. On the whole the filling in of these and the avoidance of some of the other flaws we have mentioned would perhaps have raised Italy to 1.2 and other countries to the extent to be seen from the following table, the second line of which gives our result and the third line a very rough estimate of the changed figures which would be the outcome of such a "correction" of the tables :

TABLE T62.

POSSIBLE CORRECTED MARKS OF 15 COUNTRIES IN REGARD TO THEIR WEALTH IN RAW MATERIALS.

Relative importance	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Original index	.1	.4	.5	.6	.7	.8	.8	1	1.3	1.5	1.6	4.4	6	7.5	8.3
Corrected index	. .	.4	.5	.6	.7	.8	1	1	1.2	1.4	1.6	1.7	4.5	6.1	7.7

The changes are not important, and a change in the relative position of any country is, as far as I can see, scarcely involved in these possible corrections.

A crudity in our method is the use of integers instead of decimal fractions for the weighting indexes and for the un-weighted marks. The result of the use of a decimal unit would have been that a number of entries would have appeared in our tables which do not now appear because they were below .5, and that a number of items would have appeared with fractions between .5 and 1, 1.5 and 2, and with fractions between 1.5 and 1, etc. The result would have tended, as far as I can see, towards raising the results for Nos. 4 to 11 by .1 or .2, and lowering those for Nos. 12 to 15 by about the same amount. The changes, then, would not have been important and would scarcely have involved alteration of the hierarchy. But the use of decimals here would have taken away from the method something of its character of a roughshod statistical cross-country ride which it should, I think, keep, in order to prevent

pedantic and dogmatic over-exploitation of this source of information. When you want orange juice with your corn-flakes, never press the orange pips until they give juice ; it will spoil your breakfast.

2.—*Discussion of the Real " Haves " and " Have-Nots ".*

One inference we may certainly draw with safety from our figures : *i.e.*, that our inquiry into the existing distribution of productive wealth among the 15 countries and empires possessing more than 30 millions of population explodes the myth of the division of mankind into " Have " and " Have-Not " nations. It does not abolish the assertion that some nations are much better off than others in respect to those attributes which interest us here : but the composition of the unfavoured group turns out to be quite different from what we hear so often stated, namely, that Germany, Italy and Japan are those unhappy nations which need a redistribution of raw materials in their favour. The truth is quite different, though certainly, scientifically and politically, no less interesting. The following facts can safely be inferred from our schoolmaster-like system of marks-giving :

(1) *The Plutocrats among the Nations*

There is one group of nations enormously favoured in comparison with the others ; it consists of the United States, the Union of South Africa, Australia and Canada. Three of them have " colonies " of a sort ; but they are very unimportant in territory, population and wealth in comparison with the mother country. None of these colonies contributes to the marks gained by their mother countries in even equal proportion to the amount they add to the respective population denominators (with the exception of Porto Rico, a producer of sugar-cane). If, then (a very doubtful assumption, as we shall see ; but let us assume its truth, for argument's sake), wealth in raw materials means power, the colonies of these three are leakages of power, not sources. And it is perhaps more than a mere coincidence that the highest place is held by that one country among the members of this group which has no colonies at all, *viz.*, Canada.

(2) The Upper Middle Class among the Nations

The second best group comprises our Nos. 8 to 11, so to say the upper middle class in the society of nations, consisting of two popularly so-called "Have-Nots" and two "Haves". Among these Russia is rapidly advancing, whilst Great Britain, so long as her retreat from imperialism persists, is gradually approaching more and more the situation of Italy, which is the average situation of all large countries. In the case of Great Britain the disproportion between the size of her colonial empire (big even after all the deductions we have deemed necessary) and her colonies' contribution to the Empire's wealth in raw materials is worth mentioning. It is only about two-tenths of the unit, or 16 per cent. Even Italy, with her "teeming" millions (they always teem when the author wants to give a nice impressive turn to his sentence), and with her poverty in minerals, is not so badly off after all, though her colonies do not contribute an atom towards her raw material position, but are, as yet, like Ethiopia, a distinct source of weakness. How far the possession of Ethiopia may change this in the future is, of course, just as much an open question as so many other questions concerning the future, though what we know so far does not justify any sanguine expectations. Russia has developed during the last ten years by such leaps and bounds that, in spite of her quickly growing population, it is quite possible that she may within the next ten years turn her back on so mediocre a class as the second-best group and rise into the ranks of the monied aristocracy among the great nations of the world.

(3) The Lower Middle Class among the Nations

The third group I should like to call the lower middle class among the nations. It comprises, if we follow the results of our inquiry, Holland, in spite of her great, rich and well developed colonies, Brazil, Japan and France, which is, I must say surprisingly, worse off than Japan. It is very interesting to see how colonies are distributed among these countries.

TABLE T63.
MOTHERLAND AND COLONIES OF THREE EMPIRES.

Empire	Area in 1,000 Square Kilometres.			Population in Millions.		
	Mother Country.	Colonies.		Mother Country.	Colonies.	
		Actual.	in Per Cent. of Mother Country.		Actual.	In Per Cent. of Mother Country.
French ...	551	11,910	2,163	41·2	64·5	157
Japanese ...	382	1,913	501	60·3	59·8	86
Dutch ...	34	2,042	6,006	7·9	60·9	771

Though in all these cases the contributions of the colonial possessions to the wealth in natural resources of their three empires are not negligible, it is very doubtful whether they make up for the increase in necessities which their population and territory, of course, demand. This seems to be so particularly in the case of Holland, where the disproportion of colonial territory to the area of the motherland is by far the greatest.

(4) *The Proletarians among the Nations*

The poorest group of countries consists of Poland, India and China. In India it is the fantastic and absolutely extraordinary increase in population during the last score of years which may be regarded as the chief source of the poverty of this country. The fact that these countries have no colonies cannot be deemed very important, in view of the facts we found when looking at the "lower middle class".

3.—*Particular Questions Concerning the British "Empire."*

One remark may be added: Four of the fifteen countries in our list of indexes of wealth in raw materials are parts of the British Empire. Great Britain's marks have, accordingly, been calculated by excluding from "Great Britain" in our sense the three Dominions: the Dominion of Canada, the Union of South Africa (with her Mandated Territory South-West Africa) and the Commonwealth of Australia (with the territories mandated to it), and also India with Burma. Three more territories which, in view of the smallness of their population, do not appear

among our fifteen, viz., the Irish Free State, Newfoundland and New Zealand, have also been excluded. If one counts, weighing one thing against the other, India among the sovereign parts of the British Empire for economic purposes, the Empire is a loose federation of the Motherland, six Dominions and the rather indefinite creation India (and Burma as a further extra now), bound together by tradition, by "allegiance to the British Crown" (as the Statute of Westminster says), whatever that means (as the King acts in the Dominions and in Great Britain on the advice of separate and independent sets of ministers who are responsible to separate and independent parliamentary majorities and to nobody else²), and by a bundle of commercial treaties. These are centred round the treaties concluded at Ottawa in 1932³ and in regard to the future distribution of raw materials are unimportant, because the preferential treatment which these nine units have given one another has been limited in the recent past to importation, whereas no differentiation of an imperial character has taken place with regard to export. And the present tendency is clearly towards further loosening even the economic connection and coherence of the Empire. The history of the Empire since Ottawa seems to me overwhelming proof of this. The most important items in this process may be explained here :

A new constitution for India is gradually coming into operation which subjects the commercial policy of that country in constitutional law, as it has already been subjected in constitutional practice for about 20 years, to the will of the Parliament of India, irrespective of the wishes of the Parliament or the Government of Great Britain. In these matters the Viceroy will have no powers of emergency legislation and no power to override the resolutions of the future Indian legislature. Commercial policy, therefore, falls clearly into that

² Since 1936 Burma is no longer a part of India ; but it has not returned to the position of a crown colony, protectorate or mandated territory of Great Britain ; it has retained its somewhat intermediate position of being no longer a colony but not yet a dominion. In our list, which is based on figures for the past in which the share of Burma cannot be isolated without enormous bother, we have treated Burma as part of India. But its exclusion would not change the index for India perceptibly—perhaps by .01 or so, one way or the other.

³ See the discussion on the Ottawa Conference between Lord Olivier and the present author in the various numbers of the *Sozialistische Monatshefte* (Berlin), 1932.

sphere of activities for which the Viceroy's ministers are fully responsible to the Indian Parliament.⁴

The situation as regards the other Dominions is very clearly shown in the Memorandum of the Royal Institute of International Affairs⁵ which inquires into the importance of colonial possessions for the problem of raw materials. The authors base their treatment of the Dominions, as we do here, in the Statute of Westminster of 1926, and they exclude India also from the British Empire within the meaning of their (and our) inquiry : " Thus India is excluded by her tariff autonomy since the war, quite apart from her membership of the League (of Nations) and other considerations." Though her membership of the League is perhaps not as important as the Memorandum would lead one to believe and the " other considerations " are scarcely more than a vague hint (even if there is anything to hint at), the sole argument of the tariff autonomy which India enjoys has gained in force and goes on gaining force the nearer the full working of the new Indian constitution approaches.

We are drawing the line here, though there is something to be said for the similar treatment of Ceylon, Southern Rhodesia and some other crown colonies. But the fact remains that these *are* still crown colonies, and that the overriding powers of the governors there, against the will of the local parliaments, have been made clear by the enforcement by the British Government of the anti-Japanese textile importation quotas on Ceylon in 1934. The " Memorandum " treats Southern Rhodesia like India. But as the *Dominions Office and Colonial Office List*, 1930 (p. 210), says of the constitution (which indeed gives the country a large measure of self-government, so that its affairs are treated in London by the Dominions Office, not the Colonial Office), the governor " is empowered to assent to a law passed by the legislature, withhold his assent or reserve the law for signification of the King's pleasure." This reservation of overriding powers seems so important that we believe it

⁴ In India this does not refer to the whole activities of the government ; there are reserved subjects and emergency powers in respect to which the Viceroy (and through him the Emperor) acts on the advice of the Secretary of State for India in London, who is responsible only to the Parliament at Westminster ; but these reserved subjects and emergency powers do not concern commercial policy.

⁵ See *Raw Materials and Colonies*, pp. 15 seq.

better to treat Southern Rhodesia as a colony for the purposes of our inquiry.

Other "border-line cases" are Manchuria, which has been treated here as a part of the Japanese Empire, and Ethiopia, which we must now consider as a part of the Italian Empire. The considerations of international law are clearly against this classification, even more so than in the case of Southern Rhodesia. But whereas the contents of constitutions, treaties, and even gentlemen's agreements are very real factors in matters concerning the British Empire, the same can scarcely be said, to put it mildly, in relation to the Italian and Japanese Empires. The Philippine Islands are, for obvious reasons, not treated as a part of the Empire of the U.S.

The question of status is not so important for the right understanding of the assigning of our marks, because the effects of the colonies on the present distribution of raw materials are not important. If we were to compute an index including India, Canada, Australia and the Union of South Africa into the term "Great Britain," we would find:

TABLE T64.
CALCULATION OF AGGREGATE MARKS FOR THE BRITISH EMPIRE.

	Population in Millions.	Weighted Marks.
Australia	7	3
Canada	11	5
Great Britain	104	9
India	380	9
Union of South Africa	9	3
Totals	511	29

This aggregate population of 511 million forms 29 per cent. of the aggregate population of the 15 countries in our table of valuations. We have, therefore, a very interesting result, viz., that the whole British Empire obtains the index $\frac{29}{100}$ or 1, *i.e.*, shares honours of place with the median country, Italy, and is distinctly lower in rank than Great Britain without the inclusion of these other countries in her index. It is, of course, India with her enormous population which pulls down, in this amusing but also enlightening tug-of-war, the mother country by more than compensating for all the enormous relative wealth

of the three great Dominions. As we may fairly safely assume that the poverty of Ireland and Newfoundland would at least compensate for the possibly enhancing influence of New Zealand on our index we may take it as established that this system of giving the four mentioned big parts of the Commonwealth of British Nations separate treatment does not artificially lead to understatement of the wealth of Great Britain in raw materials. If it leads to anything which has the slightest taste of bias at all it is to a moderate measure of *overstatement*.

This, I think, is all that can usefully be said about the result of our inquiry at the present stage of the discussion. To draw further positive inferences here and now would mean jumping to unjustified and perhaps quite misleading conclusions. We shall use, however, our results in the further discussion of the problems in their proper places.

B.—THE IMPORTANCE OF RAW MATERIALS

“Raw materials are just what their name implies, *i.e.*, materials which are processed into other materials and things, which may be used for any purpose, nice or less nice ; and that is the long and short of it.” So one might feel tempted to think on reading this heading, and to go on : “Their importance is therefore incommensurable, as without them no production, and therefore no consumption, is possible.”

This is quite true. But, all the same, for the purpose of clarifying our minds it is not quite valueless to know what the particular import of some raw materials may be ; what their importance is, to express ourselves in a more slipshod, though more popular manner. But the term “importance” is an ambiguous one ; we have to distinguish its meanings, and to say how we propose to use it.

Again, we have to go off in a direction which the reader perhaps will think is a tangent : into a discussion of a methodological character. But it just cannot be helped. We have a double purpose here : to exhibit the facts, and to interpret their meaning. It is easy to see what a mess the world has got into through the mixing elegantly and lazily of misstatements of facts and misinterpretations of them ; and all signs promise a far more terrible mess to come if this method is not replaced by a better one. So it is natural that our inquiry must proceed

by means of statistics (the comparatively most certain way of assembling facts) and discourses on method. Perhaps those sceptics are right who say that even the most watertight case for reason, stated in the most elegant way, will not make people believe in reason and act accordingly. I do not know ; maybe. In any case the "retreat from reason", as Mr. Hogben says, has had such terrible results that it is at least worth trying to appeal to people with the answers which reason gives to our problems. No damage can be done, and there is just a chance that people may come round and behave more reasonably, and with better results. As Father Brown said to Flambeau : " You damned reason ; and that's very bad theology."

Raw materials are interesting to the statesman looking after the interests of the population of his country mainly because they are necessary for the production of all the commodities and the performance of all the services needed for the everyday life of the members of the community. They, therefore, by their quantity and variety, determine the standard of living. In consequence, two more factors regarding raw materials claim the interest of the statesman : *i.e.*, their price and the certainty that they will be available when and as needed. Their prices determine whether they can be used for the satisfaction of consumers' wants at all, and in what quantity they may be able to contribute to the standard of life of the population. On the degree of probability that they will be available as and when needed depends the security of the standard of life.

(a) *Security of the Standard of Life.*

Any man who produces a certain material to-day may stop doing so whenever he likes ; or he may vary the quantity he sets out to produce. In a sense a nation may act, in this respect, as if it were an individual. " Production " of a raw material in the international sense means something which is closely akin to the original meaning of the Latin verb *producere*, viz., to bring forth, to hold out to possible foreign purchasers. It depends on the will of the government of a country (whatever this will may depend on) whether a country, while growing, *e.g.*, sugar all the time produces sugar in the sense of producing it for international exchange. The government can allow or disallow

the exportation of raw materials, can limit the quantity exported to any positive fraction of the total quantity produced annually, etc. Nor is this only theoretically possible. In war-time it is a matter of ordinary experience that governments prohibit the exportation of certain materials they deem particularly indispensable for purposes of defence (every country involved in a war is always and all the time fighting in defence) or the free exportation of which they believe would favour the enemy or enable neutrals to escape some nicely-prepared plan for rubber-shoe blackmail. But there is no necessity to fall back on war-time conditions for an example. Even in undisturbed peace restrictions of this sort have been quite frequent. For centuries Spain, Portugal and other European nations forbade the export of gold and silver from their territories even in peace-time. In recent times the exportation of grafting or planting material or of the seed of newly-bred, very perfect varieties of sugar-cane from the Dutch Indies was made illegal. The Peru Government does not allow the exportation of guano until what they believe to be the needs of their planters of sugar-cane and cotton are satisfied year by year. The prohibition of the export of gold is quite the peak of elegance in fashion among modern statesmen. We shall speak later of the system of putting a quantitative limit to the export of quite a number of raw materials, introduced by governments for the purpose of manipulating prices, etc. If somebody would take the pains to make a complete list of such government activities the resulting catalogue would, probably, surprise many people by the number and the importance of its contents.

One of the very important points here is whether such limitations are applied in a manner one might feel tempted to call impartial to the whole outside world, or whether differentiation takes place. It is clear that differentiation might be, sometimes, a rather important feature of such a policy. Let us imagine an example. There was a great dearth of coal in Europe immediately after the Great War, because so many mines had been destroyed and the rest had been pitilessly overworked during the war years. If, then, a country in Europe had forbidden the exportation of coal to, *e.g.*, Spain, this would have been serious. At best it would have meant that coal

would have had to have been bought from producing countries which could have delivered it only at the cost of enormous expenditure on transport, *e.g.*, from the United States; the second best possibility would have required the additional investment of much expensive or perhaps unavailable capital. The third and worst possibility would have been that, for a time at least, Spain would have had to go without coal or any substitute. For a large number of the former consumers this worst possibility of all would certainly have happened, because their incomes, their selling prices, etc., would not have permitted them the enormously-increased expenditure occasioned by the first two possibilities and the large additional investment demanded by the second one.

Since the war, still entirely the prisoners of war psychology, many European politicians have lived under the obsession of possibilities of this sort. They have spread their hysteria among the public, and so the struggle against such a danger has become an important feature of European politics. In spite of all experience to the contrary, this hang-over of the war is still quite alive and chirpy. Newspapers, speeches and popular books are full of it, and practical politics are largely shaped by the obsession of politicians, pressmen and populace that their country might be "starved" of "vital" raw materials in peace-time, and that therefore governments should see that they created an industry producing the particular raw material within their country's own economic frontiers (colonies, if any included).

I took part, as a journalist, at the end of the war in the discussion on Germany's obligation to deliver coal in kind to France to help in the reconstruction of north-eastern French territory which had been so thoroughly devastated by more than four years of warfare. Most German politicians were then of the opinion that it would cripple Germany's own recovery were she obliged to deliver the quantity of coal, stipulated in the negotiations at Spa (Belgium) at 26·2 million tons annually. I tried to show that, under certain conditions, Germany would be able to deliver this quantity and even more, and I concluded my part in the debate with the words :

"It would have been in the interest of the alleviation of Germany's obligation to contribute to reparations if Germany had managed to transform the *right* of the Allied Powers as

laid down at Spa, to get such quantities of coal delivered into an *obligation* on those powers to take this coal.”⁶

This shows how necessary it may be at times to make it clear that a policy of restriction of exports in peace-time is wrong, and how difficult it may be to make this clear to all those concerned. There are situations when restriction of exports for the purpose of better provision at home or discrimination against some nation or other for the purpose of damaging it exercises a great attraction on those deciding on important questions of economic policy. In view of this it seems to me all the more remarkable that all my endeavours to find a case of discrimination against a nation or a group of nations by a policy of restricting exports of raw materials in peace-time have been entirely without result. Nothing of the kind of at least fairly recent date (say after 1920) could be found, and it is remarkable that authors who do not discard the fear of such an eventuality always gloss over, more or less skilfully, the difficulty when it comes to giving examples from experience. We may take it as established, therefore, for our further discussion, that such discrimination has not been part of modern experience. Though that does not make it impossible in the future (there are no *a priori* limits to what madness can do) it makes it at least extremely improbable.^{6a}

This does not mean that restriction of exports of important raw materials without discrimination among buying nations is equally improbable. Quite the contrary; it is a frequent modern experience. But what does it come to?

⁶ See H. *Kranold*, “Die Kohlenfrage in Spa” and “Wie bezahlen wir die Milliarden an die Entene” in *Die grossen Wirtschaftsfragen* (Hannover), I, pp. 1 *seq.* and 25 *seq.* (1921.)

^{6a} I have already mentioned in Chapter I the exception of tin. Two more cases, also obsolete now, appeared as fruits of my enquiries: (1) In 1916 Nigeria passed an act discriminating by means of an export tax on palm kernels in favour of those exported to be processed in the British Empire; the discrimination came into force in 1919 and was repealed in 1922. (2) For some years, from 1919 onwards, India gave a rebate of two-thirds of the export duty of 15 per cent. *ad valorem* on hides and skins on those exported to be processed within the British Empire. In 1923 the tax was reduced to a flat rate of 5 per cent. for all destinations, and the preference in favour of the British Empire was abolished. (See *Bastable-Gregory*, pp. 66, 171, 199, V. *Anstey*, p. 347, B. M. *Das* in *Current Science* (Bangalore), November, 1936, p. 261, and J. H. *Richardson*, pp. 136-137. All these exceptions were unimportant except in so far as their short lives, and, in the case of tin, their lack of effect, have shown the futility of such a policy.

Our statistical tables show us, and the table which sums up the whole of our statistical work does so in a particularly impressive manner, that at least among the 70 raw materials we have taken into consideration here there are scarcely any of which we could say that one country enjoys a total monopoly of its production at the moment. The cases coming comparatively nearest to such a production monopoly of a raw material of some importance are the following :

Nickel, Canada ; palladium, Canada ; " other " platinum metals, Canada ; molybdene ore, United States ; strontium minerals, Great Britain ; hempseed, Russia ; jute, India.

Most of these cases are not, it is obvious, of particularly great importance in peace-time ; even a dire scarcity of red rockets on July 4th in the U.S. and on July 14th in France, should the United Kingdom abuse her quasi-monopoly of the production of strontium minerals, would be a tolerable evil, after all. . . . And our table shows that only one of these raw materials gives its producing country unweighted marks of 10, viz., jute in India ; so that only this index shows an approach to a real monopoly. But here the temptation to extort high prices from other countries by a temporary embargo on exportation or to starve other nations of sackcloth by a permanent embargo is very small, because there are so many substitutes for jute fibre which would be produced elsewhere in enormous quantities following a comparatively slight rise in the price of jute. What else could the Indian Government do with the surfeit of jute on their hands than to repent in sackcloth over their mistaken policy ?

In all the other cases limitation of export is a matter for concerted international action (rubber, coffee, cotton, sugar) which has been tried again and again with remarkable results, as we shall see later on, in recent times, but with results rather out of line with the arguments of those who take the expectation of embargoes on the exportation of important raw materials in peace-time into consideration as an item affecting their plans for an economic policy.

There remains only the case where a country gives preference to its own citizens' needs of a material as against those of the inhabitants of other countries, like Peru with her policy of forbidding the export of guano under certain circumstances. But

cases of this sort have made so slight an impression (because of the intervention of substitutes) that this instance itself is almost unknown and scarcely mentioned in the literature on the subject.

(b) *Price and Range of Consumption.*

In quite a number of cases governments have arranged plans for either increasing the price of a raw material which is an important item in the export trade of their country or for curtailing the volume of exports, generally with the intention of bringing about such an increase in price by a roundabout way. Actions of governments are not always positive ; sometimes they only "favour" or even merely tolerate certain behaviour on the part of their subjects or groups of subjects. In other cases either concerted action by several governments or favourable or at least tolerant treatment of the activities of international capitalist private organizations are found. The question whether a particular case comes under the heading of government action or of favouring or toleration is of minor interest. We may take it for granted that the most private efforts at price-raising and restriction by the most private capitalists are not done without their government throwing a kindly eye on their undertaking.

The list of examples is long and quite recent ; many of the restriction plans are still in operation,⁷ and it is not probable that this policy of restriction will disappear soon from international business life.

In 1922 the so-called Stevenson plan, which we have already mentioned, was introduced, which endeavoured to enhance the price of rubber by restricting exports from the British territories producing rubber (British Malaya, British Borneo, Ceylon, etc.). The consequences were at first an enormous rise in the price of rubber, then the growth of powerful outside production, then a great breakdown of price.

These developments took several years. During these years the rubber producers everywhere had a fat time, but not only was outside production stimulated, the working-up of scrap

⁷ The international tin syndicate was extended for a further number of years, in February, 1937 ; the share of Siam was cut down a bit ; otherwise no important changes seem to have been made. Bolivia is now a participant in the plan.

rubber became profitable, the production of rubber from coal-tar derivatives came near to being profitable on a large scale, and even the collection of wild rubber in Brazil (where reserves of untapped *Hevea* rubber trees are estimated at 300 million or more) and elsewhere was revived for a time. The chief profits went to the outsiders who enlarged their plantations and gardens of rubber trees enormously and tapped every tree which was even half mature. Consumers had, for a few years, to pay "through the nose", which made them extraordinarily irate, but later, when prices slumped again, they quickly recovered their losses.

After another period of extremely low prices a new international arrangement for the restriction of output came into force. This time the important outsiders were included (chiefly Siam and the Dutch Indies) and the restriction of exports was now handled so cautiously that prices could not again rocket sky-high. The prices at which wild rubber, artificial rubber and recovered scrap rubber became able to compete with new plantation rubber (2s., 2s. and 1s. 6d. or so per lb. respectively) were respected in the price policy of the new corner. A mild degree of profit was obtained by those producers who had survived the second slump, rationalization and cheapening of their production methods was encouraged, and the consumer paid a price which on the whole must be called perfectly bearable. After all the consumer of a commodity cannot very well expect a producing industry to supply him permanently at prices which cause it to lose its capital. Our tables concerning rubber prices show all these features quite clearly.

Let me give two more examples of the effects on prices of international restriction of important raw materials: steel in Europe, and tin all the world over.

The world market for steel is divided into two parts; one of them is served chiefly by the heavy industry of the United States, the other by that of north-western Europe: Great Britain, Holland, Belgium, Luxemburg, France and Germany. The territories on which these two groups actually compete are of minor importance. It was, therefore, not an impossible idea to restrict production in the European field alone for the purpose of improving the prices of steel in their particular selling areas. The European Iron and Steel Agreement of September

30th, 1926, was signed by German, French, Belgian, Luxemburg and Saar industrialists. Of the whole quantity to be produced, Germany and France obtained quotas of 40 per cent., and smaller shares were allotted to the minor members of the group. Prices were not fixed, nor were markets shared out to the several partners. The only factor to be manipulated was the aggregate production. Since then the agreement has undergone many changes in detail, it has been temporarily stopped, Great Britain and some new minor partners have become associated with it, but the principle of regulation of the market by manipulating the quantity produced has remained unchanged. The outcome is shown in our table of the course of the prices of iron and steel—A1 (8). If we make 1913 = 100, we get, for some important iron products in comparatively unprotected areas like Great Britain and Belgium, the following price index figures :

TABLE T65.

PRICE MOVEMENTS OF IRON AND STEEL IN WESTERN EUROPE, 1929-1936 ;
INDEX FIGURES.

1913=100.	1929.	1932.	1936, July.
Pig iron, Great Britain	119	71	78
Iron bars, Belgium	112	48	62
Girders, Belgium	88	39	54

The fact that this trend of prices, in the teeth of the quickly-increasing wave of international rearmament requiring enormous quantities of steel, led even in 1936 to prices which were only one-half or three-quarters of what they had been in 1913, seems to me proof that the government-favoured monopoly policy of these cartellists was remarkably cautious. The price level of 1929 was not particularly high. The slump was rather deep, and recovery in prices slow and small. It would have cost the consumers of iron and steel many, many million pounds more to buy the quantities of steel they bought in 1934/1936, had they had to pay anything like the prices they had to pay and did pay ungrudgingly before the Great War.

Another important international output restriction scheme designed to "improve" prices was (and is) that in respect to tin. Here the producers on British territory (Great Britain, Nigeria, British Malaya) and some others like Siam have arranged for

120 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

the restriction of the quantities of this metal offered on the world market. Our tables enable us to assemble the following instructive figures :

TABLE T66.
STATISTICS OF MARKETS FOR TIN, 1929-1936, WITH INDEX FIGURES.

	1929.	1932.	1935.	1936.	
				June.	July.
Production of tin ores in 1,000 metric tons of tin content	195.1	98	149.8		
Index (1925=100)	132	66	101		
Stocks of tin on world markets, in 1,000 tons	28.3	59.1	17.4	15.7	
Index (1925=100)	117	244	72	65	
Price of tin in London, in RM. per 100 kg.	411.67	196.92	271.85		229.14
Index (1925=100)	79	38	52		44

Here again it seems as if the lessons of previous restriction schemes for other raw materials had been well learned. Though restriction had by 1932 brought output down to half what it had been at its peak in 1929, this was the result, obviously, of a very conservative policy. Stocks increased, so that one cannot say that a particularly high degree of scarcity of this important metal was created. Later on stocks fell below the level of 1925, but prices remained remarkably moderate, at least well into 1936. No substitutes and no newcomers were encouraged, and one cannot say that the consumers have been hit hard by a policy which involved these prices.

Not all the plans for the restriction of output of raw materials for the purpose of stabilizing (or, better, buttressing) prices show the same features. Hope of profit has, often enough, led the leaders of such organizations seriously astray. Indeed, we find among these "valorization" schemes some which, in their endeavours to skin the consumer while keeping him alive, are suspiciously similar to simple corners in one or the other commodity such as from time to time are organized on the commodity markets of the world. But it would be unjust to think that this describes the mentality from which most of the valorization schemes spring. What happens when such valorization schemes are tried ?

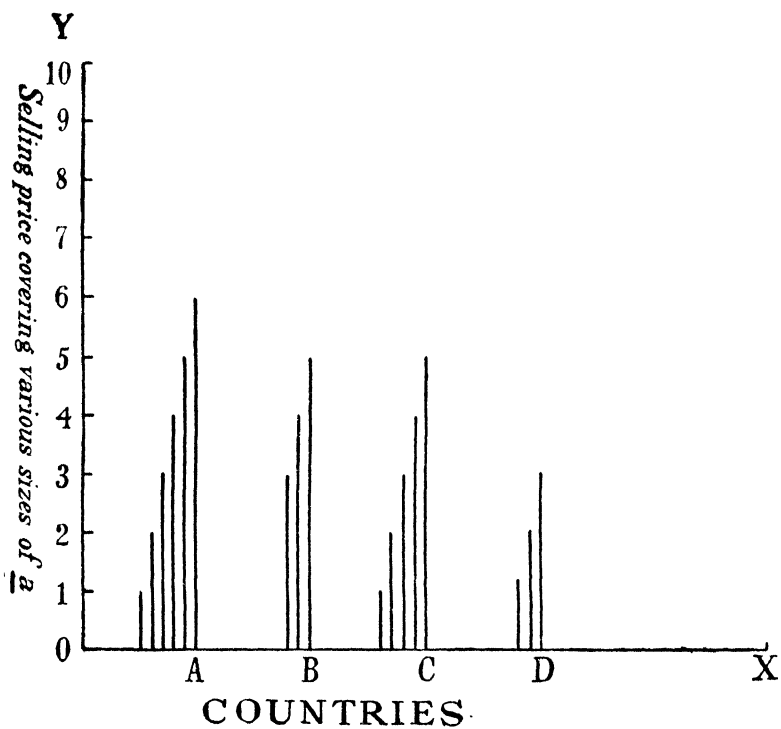


Figure 3: Influence of Overhead Charges on Survival of Competing Firms in Different Countries.

Let us assume that a number of countries, A, B, C, D. . . produce some commodity which is liable to suffer from enormous variations of price and demand on the world market. Production will either follow the law of diminishing or of increasing returns ; the first case will probably be the one which interests us most, because the extractive industries (like mining) and agriculture mostly follow that type. We shall, however, treat only the case of diminishing returns, as what we prove for this case is *a fortiori* true for the opposite case.

The equation for the cost of production will be, if we assume that it is linear in type, *i.e.*, that the elasticity of the curve is everywhere the same, of the form :

$$y = a \pm bx$$

where : y : cost of production per unit ;

x : quantity produced ;

a : a constant of the general overhead charges ;^{*}

b : a constant characterizing the angle which the curve makes with the x -axis.

The sign before bx will depend on whether we have a case of increasing or diminishing returns ; in the first case its sign will be negative, in the second case positive.

There is no necessity for any factory, plantation or mine to have the same a and b as any other factory, plantation or mine.

Now let us look at the meaning of different sizes of a for a given b . Figure (3) shows in the form of straight lines the several selling prices which are necessary, when the productive capacity of the enterprise is fully used, to allow the enterprise to work without a loss. We then see very simply that all enterprises can work when the price is 6.5, that a few make losses when the price is 4, etc.

As the several classes of enterprises with different a 's contain

^{*} a must be understood as representing all cost items which are independent, in their absolute size, of the quantity produced and which, therefore, increase in weight per unit produced when the quantity produced decreases. b is the constant on which it depends whether in a particular enterprise a decrease or increase of the quantity produced makes for a quick or slow increase or decrease of cost per unit. Our equation is an artificial simplification ; the real equation will probably never be linear ; it will have additional terms of the form $\pm cx^2$, $\pm dx^3$, . . . But we simplify to save unnecessary mathematical calculations, the result of which would not be different, in principle, from the simple case we are analyzing here ; and we limit ourselves to a qualitative analysis, which is also sufficient for our purposes.

varying numbers of members from country to country, some countries have to disappear from production entirely at certain price levels, in others some enterprises close down, etc.

After a time the accumulated stocks which drove the price down become exhausted, consumers fear running short of supply, confidence returns, consumers of the raw materials accept larger orders, and prices rise again so that they cover the costs of all the classes which had to stop production while prices were low. If, in the meantime, the works or plantations have been simply lying idle, they may be reopened and begin production again. But this will rarely be the case, when low prices have persisted over a fairly long time. In these cases mines will have been drowned in water, plantations may have become wildernesses of weeds and obnoxious plants, parasites and pests will have multiplied luxuriantly, factories may have been pulled down, become dilapidated or obsolete, in short, a new investment on a large scale is necessary to restore production to its original size, and consumers will have to pay for this. They will recuperate later, and they will have been compensated for some of this cost by previous profits while prices were low. But this is true only if we take "*the consumers*" as a unit, not when we look at the fact that the individuals composing this group will have changed and will further change. The one then pays for the gains of the others, etc. There is no strict solidarity of interests between "*the consumers*."

To a certain extent the producers who work under conditions of decreasing returns will be able to meet the heavier and heavier burden their overhead charges mean for them when prices fall by curtailing their production; but this is true for all enterprises, and so in the ensuing competition their gain from a falling incidence of bx will be over-compensated by the increasing weight of an absolutely invariable a .⁹

A different development will follow if production is curtailed in such a way that the fall in prices is mitigated. In this case losses will be distributed more equally over the various enter-

⁹ The result of this antagonistic interplay of a and b will depend on their relative size, when the sign bx is positive. The case of $-bx$ (law of decreasing returns) does not make a and b antagonistic; the effect of both of them works then in the same direction, unfavourable when prices fall and favourable when prices rise.

prises, those which have a favourably low a will bear part of the losses, those which have an unfavourable a will get off lightly, and more, or even all, enterprises will survive into the next period of better prices, so that new investment to re-establish full producing capacity at the previous level will not be necessary and will not have to be paid for by the consumers. Some consumers will forgo speculative gains, others will avoid speculative losses ; prices will be kept within a narrower range of variations, and that will make for stability and safety in the raw material industry as well as in those industries which process the raw material in question. Governments which have an interest in stable employment and taxation returns will naturally favour such a development.

The indispensable condition for all this is that the organization which puts the brakes on the fall in prices should enjoy a stable monopoly ; otherwise it will favour the intrusion of outsiders, whose production will, in due time, bring down prices with a bump in spite of all endeavours to buttress them, driving out of production many members of the monopolistic coalition.

If the elasticity of the curve of cost is low, curtailment of production will have to be done on a large scale ; the larger this scale, the nearer the conditions of the regulated market will come to the conditions of the unregulated market, and the less stabilizing will be the influence on prices and on the survival of weak enterprises.

Consumption at definite price levels varies in this world in accordance with the way in which business conditions vary between brisk, intent business and high degree of employment and periods of depression, inactivity and widespread unemployment. If demand is to be satisfied at all in the peak boom period it is inevitable that at the bottom of the slump a considerable volume of unused capacity of production should exist. This is quite all right for factories with a low a , but pernicious for those with a high a .

I think that governments interested in stability, industrialists, planters, etc., interested in factories, plantations, etc., with high a 's, and, if they are provident and cautious also capitalists interested in enterprises with low a 's, may find the idea of spreading the loss in profits over all enterprises, by preventing, to a certain extent, the fall in prices, and of keeping

alive as many of the enterprises as possible through the slump period, very attractive.

Even consumers may find it to their advantage not to reap the full profit accruing to them temporarily (often only too temporarily) as a result of the drop in prices, thus avoiding later scarcity and a high price period. Their position, of course, depends on how strongly the syndicate would put on a brake on prices. But those syndicates which have learnt the lessons offered by experience of valorization during the last twenty years will know :

1. That to restrict production too much means heavy losses ;
2. That it is not a wholesome policy to encourage, by particularly high prices, the intrusion of outside producers.

So their interest, if they understand it correctly, and particularly if the governments involved understand theirs correctly, should lead them to a conservative scaling down of production. By trial and error, by *tâtonnement*, they should find the best medium course to adopt. Experience seems to show that, as the years go on, valorization schemes adapt themselves more and more to the dictates of wisdom ; and on the whole it seems to me that the consumer does not fare badly through such a policy.

Whether such a policy is feasible is, of course, quite a different question. In cases where a medium price allows outsider production to raise its head, in cases where some governments and/or industries with fairly low *a* costs remain outside the scheme and in cases where even a medium price still favours the large-scale production of substitutes, the thing cannot be done. The restriction of output will in these cases have to be small and the price must be allowed to sag rather considerably. But the more the price drops in this way towards the level which would be reached under free competition, the more similar the general consequences of a policy of concerted restriction become to those of a competitive regime, and the less worth while it becomes, therefore, to undertake the whole valorization plan.

We can enumerate quite a number of valorization schemes which belong to this "non-feasible" type ; to name a few

examples: the first Stevenson plan in rubber; the government's coffee valorization in Brazil; the co-operative wheat pooling policy in Canada; the government limitation of the area under cotton cultivation in the United States. It is characteristic that all these examples show restriction of production in only one or a few of the producing countries in which the production of the particular raw material is actually or potentially of importance. Sometimes sheer luck saves such schemes at the last moment; those involved have a hair-breadth escape, like the Canadian growers, co-operative societies, banks and governments connected with the Canadian wheat valorization. But sometimes the whole economic structure of a country may be shaken, as, *e.g.*, the case of the coffee valorization in Brazil shows.

Enterprises of this sort, if undertaken without success, or continued beyond the first period, before the coming in of outsiders (this first period always shows splendid success and induces people to give the thing up either too late in the day or not at all) have the nasty knack of involving more and more deeply the general business life of the country in which they are worked. Stocks increase; producers or their co-operative societies or governments borrow on the "security" of these stocks; the existence of the stocks, known to all the world, drives prices farther down and keeps them down, so that the collateral security no longer covers the loans; selling-out of the stocks to cover the margins begins and the market slumps farther and farther for a period. Producers, co-operatives, bankers, depositors and the government suffer huge losses. The crowning mistake is made when stocks are destroyed; the peak of bad luck is climbed when stocks turn bad and have to be destroyed. The security for the loan is then burnt or thrown into the ocean; the credits based on them have to be written off, and many people's savings and employment go overboard with the spoiled goods.

Sometimes a "fortunate" series of bad harvests may save the valorization, as this seems to have happened in the present case of wheat owing to the poor harvest of 1936 and the heavy buying by frightened governments anxious to lay in stocks as insurance against famine in case of war. But what are one or two such lucky escapes at the last minute compared

with the experiences in the majority of such cases, where this kind of *deus ex machina* does not provide a happy ending to the adventure ?

To sum up : It may be that consumers have to pay " through the nose " in cases of restriction of production of a raw material. But they will get their own back with a vengeance. Adventures like the first Stevenson scheme or the Brazilian coffee valorization have made the frequent recurrence of such cases very improbable. And " mark my words " : discrimination against any particular purchasing country has been a totally unknown feature in all cases of this sort.

C.—NON-ECONOMIC USES OF RAW MATERIALS.

The provision of the belligerent powers with raw materials in war-time is quite a separate question. This is naturally the concern of politicians, statesmen and pressfolk. It is perhaps equally natural that, with the memory of the last war still alive in their heads, and with the permanent danger of a new general conflagration providing the headlines of their papers every day, the public at large think of all problems connected with the international distribution of raw materials in the first place in terms of war. And indeed, if self-sufficiency in these materials has any importance at all, it is certainly when strategical interests become vital.

The ardent interest of a wide public in this question has been precisely the cause of a terrible inundation of sheer bilge into popular and political discussions of the matter. Pride and prejudice have rarely had such a heyday in economic writing as when Sir Samuel Hoare's speech at Geneva in the autumn of 1935 drew, efficiently though involuntarily, a big red herring across the trail which leads to truth. A dispassionate statement of the facts is, therefore, all the more necessary and valuable.

Much of the work necessary in this field has been done by an extremely interesting book by Mr. Brooks Emeny (*The Strategy of Raw Materials*). It goes into the question systematically. It has a profuse outfit of impressive graphs. It gives statistical material of interest. And, together with our own studies, it enables us to make quite definite statements concerning things as they actually are.

Mr. Emeny, in general, limits his inquiry to seven states : the

United States, Great Britain, France, Germany, Italy, the U.S.S.R., and Japan, the "Great Powers", the "Big Seven", as we might say. I think that he is quite right in doing so, as to take into account the details concerning smaller countries might only create a maze of facts among which the Ariadne thread of real understanding might get entangled and even break. His list is really not so much smaller than ours of 15 countries, since he includes Canada, India, South Africa and Australia in his term Great Britain. So our list of fifteen includes beyond his list really only Poland, China, Brazil and Holland, countries on whichever, if any, side they may be found will not be of very great significance in case of war as producers of raw materials.

In another direction we cannot quite approve of Mr. Emeny's method. He distinguishes, quite rightly, between Mother Countries and Empires. But when speaking of the British Empire he uses this term so as to include the Dominions and India. Now it is true that for some of the Dominions a patriotic all-British revival may be expected in case of war, which even may lead these Dominions to take part in it on the side of the United Kingdom. At least it is probable that neutrality may be operated so as to withhold raw materials of military importance from her enemies. But I should think that the list of such "certs." is exhaustive if we put on it Australia and New Zealand. Canada and Newfoundland may be only slightly dubious, but dubious they will be, particularly if the United States keeps out of the conflict and boycotts the export of war materials to the United Kingdom, her allies and her enemies with beautiful impartiality. The Union of South Africa seems a very dubious factor, and the Irish Free State and India can scarcely be considered as more than sources of additional trouble. It seems to me, therefore, that probably five and possibly all the seven of the Dominions should be eliminated from the assets of the Mother Country.

The commodities with which Mr. Emeny is concerned are :

Metals : iron (ore), copper, lead, aluminium (ore), zinc, manganese, nickel, chromium, tungsten, antimony, tin, mercury.

Other minerals : coal, petroleum, nitrates, sulphur, potash, phosphates, mica.

Organic materials : cotton, rubber, wool, and occasionally :
 " food," " power."

(a) *Peace-time Production is not Sufficient in War-time.*

There is one assumption underlying the whole review of Mr. Emeny's which, though it is a very moot point in all these discussions, is difficult to avoid. " Self-sufficiency " for war-time is taken as being a result of two conditions.

It is believed that the absence of net imports of one or a number of raw materials over a number of characteristic years, or the presence of net exports in peace-time, will constitute self-sufficiency, *i.e.*, that the demands of the belligerent state will not be higher than those of the same state in peace-time. Even had Mr. Emeny taken years when, in the pursuance of large-scale armaments, the Big Seven were building up reserves of raw materials, this would still have been a very bold assumption. But in view of the fact that Mr. Emeny's statistical data end generally with 1932 or even an earlier year, the assumption becomes particularly dubious. The years he has taken as his basis are those years before the craze for armaments gripped the world. It is idle to assume a general percentage by which the peace-time figures ought to be increased in order to make up for the increase of consumption resulting from a war, and to inquire in what cases self-sufficiency would still then remain. The percentage would, in all probability, be extremely different from material to material and might vary in the course of a lengthy future war just as unexpectedly and unequally as it did during the last war. But we must not forget, because it is impossible to correct the error, that an error it is, and a serious one, I believe.

(b) *Peace-time Production cannot go on in War-time.*

Peace-time production, on the whole, can be assumed, at least, to be not larger than the war-time requirements of strategically necessary raw materials in a belligerent country. In this respect it is characteristic that the word " Labour " does not appear in Mr. Emeny's index. But war means a serious deficiency of labour all over the body economic, human as well as animal, and of power both mechanical and electrical. How such a shortage affected Germany's agricultural production, together with the deficiency in materials for manuring the fields, can be seen from the following table :

TABLE T67.

INDEX FIGURES OF TOTAL HARVESTS IN GERMANY, 1914-1918.

1913 = 100.

Year	Wheat.	Rye.	Oats.	Potatoes.	Sugar Beets.	Rough Fodders.
1914	86	85	93	85	100	99
1918	55	66	49	56	59	72

Already the second year of the war (1915) brought the harvest of oats down to 62, of sugar beet to 65, of hay and other dried green fodders (rough fodders) to 79 and of rye to 75. After one year, therefore, the decline in production was more than a quarter of the whole. The number of cattle fell between December 1st, 1914, to December 1st, 1918, from 21·8 to 17·2 million, and that of pigs during the same four years from 25·3 to 10 million. The losses in the average weight of these animals (excluding calves) were 41 and 65 per cent. respectively. This gives us for cattle an index (1914 = 100) of 41 and for pigs of 14 for 1918! Though scarcely any part of Germany producing coal was in the war zone at any time, the production of coal diminished in this way :

TABLE T68.

GERMANY'S PRODUCTION OF COAL AND PIG IRON, 1913-1918.

					In Million Tons.		
					1913.	1915.	1918.
Coal	...	...	...	...	190	147	158
Pig iron...	...	...	...	...	19·3	11·7	9·2

These results occurred in spite of feverish endeavours to produce, with the help of millions of prisoners of war, as much as possible of these foodstuffs, fodders and vital raw materials. Here again losses of 17 and 52 per cent. were experienced.

Again we cannot apply a definite general percentage to the decrease of production of vital raw materials. But the fact remains though its elusive character allows it to escape our calculations.

(c) *The War-time Outlook for the Big Seven.*

Self-sufficiency in peace-time can, therefore, be assumed to persist in war-time only subject to the following qualifications :

- (1) Self-sufficiency in war-time cannot be expected unless
 - (a) Peace-time imports will not be cut off ;
 - (b) Peace-time net exports form at least 20 to 30 per cent. of home consumption, or unused capacity to produce amounts to a similar percentage.
- (2) Self-sufficiency cannot be assumed to persist in war-time unless it is independent of imports from countries or " possessions " which will probably be neutral.

We shall have to revise the lists given by Mr. Emeny in this light. He gives a long table of raw materials in which the United States will be fairly well off in case of war, and we agree with this list. Mr. Emeny's list for Germany is : power, iron, chemicals, coal, iron ore and nitrates, but I should feel inclined to put a question mark against power and nitrates and to strike iron and iron ore from the list.

Mr. Emeny's list for *Great Britain* :

Power, iron, chemicals.
Coal, iron ore, copper.
Lead, nitrates, aluminium.
Zinc, rubber, manganese.
Nickel, chromium, tungsten.
Wool, tin, mica.

For *France* :

Food, power, chemicals.
Iron ore, nitrates, aluminium.
Nickel, chromium.
Potash, antimony.

***Russia* :**

Food, power, iron and ore.
Chemicals, coal, petroleum.
Copper, lead, sulphur.
Cotton, zinc, manganese.
Mercury, mica, chromium.
Wool, potash, phosphates.

***Italy* :**

Food, power, chemicals.
Lead, nitrates, sulphur.
Aluminium, zinc, mercury.

***Japan* :**

Food, power, coal.
Copper, nitrates.
Sulphur, mica.

My list :

Power, iron (?), chemicals.
Coal, iron ore (?).
Nitrates, aluminium (?).
Rubber.

Wool (?), tin, mica.

Food (?), power, chemicals.
Iron ore, ^(*) nitrates (?), aluminium.
Chromium.
Potash ^(*), antimony (?)
Iron ^(*).

Do.
Chemicals, coal, petroleum (?).
Lead, sulphur.
Do.
Do.
Potash, phosphates.

Food (?), power (?).
Lead, nitrates (?), sulphur.
Zinc, mercury.

Food (?), power.
Copper (?), nitrates.
Sulphur, mica.

* Depending on the non-invasion of Lorraine by an enemy.

In the cases of Germany, France, Italy and Japan, Mr. Emeny's list is already not a very imposing one, and our revision makes it extremely poor. It reduces even the better position of Great Britain to quite an appreciable degree. Only the United States and Russia make a better show. But many materials of distinct war-time importance do not appear on any of these lists ; and if the scepticism expressed in our question marks is justified we find that of 26 items in our list (counting iron and iron ore as separate items) we find a positive result in the following numbers of cases :

United States	...	...	...	21	France	...	...	...	...	7
									(of which 3 conditional)	
Germany...	...	...	...	3	Russia	...	...	...	...	16
Great Britain	...	...	...	7	Italy	...	...	...	...	4
					Japan	...	...	...	...	4

And even more significant than the list of positive cases and the mere numbers is the following list of a few important clearly negative cases (disregarding "question-mark" and "conditional" cases) :

Germany : food, iron ore, iron, petroleum, cotton, aluminium, rubber, manganese, nickel, tin, wool.

Great Britain . food, petroleum, cotton, manganese, nickel.

France : petroleum, cotton, manganese, rubber, nickel, tin, wool.

Italy : the same, and : aluminium, chromium.

Japan : the same.

The list is clearly an important one. Of course it does not tell the whole tale. There is, within certain limits, the possibility of the use of substitutes. The light liquid fuels and the heavy oils burnt in aeroplanes and other vehicles of military importance driven by internal combustion motors may be produced from coal in several ways, by liquefied hydrogen and other combustible gases, and so on. But there is a wide gap between an industry established on a small experimental stage and an industry functioning on the certain and large scale which a war might demand. There are stocks on which a country may draw largely in war-time : nickel coins may be melted down, copper roofs may wander into the melting-pot, etc. But if artificial silk and other textile fibres are to take the place of cotton *and* wool, while cellulose is required at the same time as a substitute for dozens of materials the country can no longer import, then an inroad into the country's forests and

labour market may become necessary on such an enormous scale as to be an impossibility.

(d) *Shortage of Labour in War-time.*

The shortage of human labour in a belligerent country is particularly remarkable. Let us sketch out a case.

Germany¹⁰ had a male population, between the ages of 15 and 65 years, in 1933, of 21.6 million. The number of male persons employed of the ages 16 to 65 was 19.3 million. For the female population the same figures were 23.3 and 10.8 million respectively. This leaves at best the following "reserves":

TABLE T69.
GERMANY'S LABOUR RESERVES.

	Males.	Females
Persons not employed in peace-time	1.9	12.5
Of which we have to deduct:		
Mothers in families with more than 3 children		3
Mothers with birth in that year ⁽¹¹⁾ ...		.7 3.7
Net reserve	1.9	8.8

¹¹ Of all women between 15 and 65, 5.7 per cent. had a confinement in 1935; so this figure represents 5.7 per cent. of 12.5 million.

This brings the net reserve to 10.7 million people. From this we have further to deduct all people who are in any way unemployable, say ten per cent. or 1.1 million, which reduces the reserve for employment or military service to 9.6 million. If, then, 10 million soldiers are needed and 2 million extra people for work to make substitutes for missing imports, there will be already a surplus of demand over supply. But even this is still too optimistic a picture; we have to make a further deduction, to make up for the fact that women generally are not quite as efficient in male work as men if they have never done that work before and do not usually take to it. We assume for this fact a discount of 20 per cent. The new requirements are 12 million people, and all reserves really available may be calculated by the formula

$$1.9 - \frac{1.9 \times 10}{100} + \frac{(8.8 - .9)80}{100} = 1.7 + 6.3 = 8 \text{ million.}$$

¹⁰ I take the figures for Germany because they happen to be at hand; the case is fundamentally the same for all European countries.

So the maximum strength for army service plus additional labour for war-time production would be only 8 and not the required 12 million—and if a larger number of men is put into one of the two groups of war service the other category will have to go short by a corresponding amount. As this does not take into account any losses or increase of mortality from other sources the deficiency of 4 million may safely be taken as a minimum figure.

Our point is that this shows that the development of the use of substitutes cannot go on indefinitely. In this self-sufficiency-ridden world of ours substitutes which are not used in peace-time are not used largely because they require too much work. If we assume that they require, for the same degree of satisfaction of needs, 50 per cent. more work in investments and current employment together we shall be not so very far away from the truth.

So we find that a country can use substitutes ; it can create one or a dozen substitutes in certain quantities of medium size. But it cannot use them in war-time indiscriminately without either stopping important other industries or draining its army of fighters. All this is true even if we totally disregard, as we have done, destruction of civilian life and of factories, etc., by air attacks. This reasoning goes, I think, quite a way already towards proving that the idea that self-sufficiency in peace means something very “comfortable”¹² in the way of self-sufficiency in time of war is erroneous.

(e) *The Bunkum of “Control”.*

If this pricks a nice bubble, another one is not less worth while pricking. Namely that of the “control” of raw materials.

It is a very handy word, control, and used, flippantly or seriously, by many people. There is often (though not always) some meaning behind it ; though it is important, if not easy, to find out how much there is behind it in each case. Again we have to distinguish between control of a raw material in peace-time and in war-time.

¹² A word Mr. Emeny frequently uses !

(1) *Control in Peace-time.*^{12a}

Here control of, e.g., coal in Belgium, may mean that some person or group of persons or some public authority can decide what quantities of the one or the other or of all sorts of coal are to be produced and/or marketed within a certain period of time, in a certain area, at certain prices, possibly even to certain consumers only. This, obviously, does not contribute anything to our subject, though it is important enough in other respects.

Again, a group of Belgian capitalists may own the majority of the shares in one or several coal mines outside Belgium. They can then decide to import that coal into Belgium or to sell it elsewhere in certain quantities, to offer it at certain prices, to curtail or enlarge its production, etc. This may be important in case a particular quality of coal is necessary for some special purpose and can be safely expected to be available in the necessary quantities at the right time only from this source. In other cases "control" of an enterprise, at home or abroad, may mean the possibility of manipulating its shares, of making it sell to particular customers at a loss or at least an unjustifiably low profit, etc. But all this has no importance for the provision of raw materials in international life. This would not be true, however, if, for example, the control of the copper mine *Aleph Alpha* in *Chamberlainisia* by the *Morning* interests would mean preventing the *Evening* interests controlling the

¹² The futility of the usual meaning of "control" of a raw material comes out very clearly in the following boastful statement by Sir Edward Mackay *Edgar*, sometime president of a group of British oil capitalists. Messrs. E. H. *Davenport* and S. R. *Cooke* have gleaned it from an article of Sir Edward's in the September, 1919, issue of *Sperling's Journal* and quote it in their book: "The British position is impregnable. All the known oil fields, all the likely or probable oil fields, outside the United States itself *are in British hands or under British management or control or financed by British capital*. America . . . will have to purchase from British companies. . . . We hold in our hands the secure control of the future of the world's oil supply. We are sitting tight on what must soon be the lion's share of a raw material indispensable to every manufacturing country . . . *the future has in store for us to hold up the entire world to ransom*. . . ." Is it to be wondered that the uncritical reader takes such an outbreak of "exuberant" spirits seriously? But what is the relevance of the argument? The possibility of exploiting the foreigner in peace-time by making him pay "through the nose" does not carry with it any political power of providing oneself with a necessary raw material in war-time. And would Sir Edward let off the British consumer more cheaply than the American customer, or would he propose to "hold him up to ransom" also? (Italics in the quotation mine.)

mine and refusing to sell copper to people in whom the *Morning* group took a lively interest, especially if these people had no other possibility of buying copper. It is obviously possible that an international monopoly, created with or without government help, of the production of some raw material might restrict production or quantity sold, enable minimum or maximum prices to be fixed, the division of markets among its members, etc. But as curtailment of turnover is costly, it will be kept strictly within the limits of what seems indispensable ; and to discriminate against the industry of one or the other country would scarcely be a sport cultivated by people enjoying such "control"—simply because arbitrage would make such endeavours futile. "Control" in this sense is a very interesting business proposition on which opinions are widely divided ; but it is scarcely of interest in regard to the international distribution of raw materials.

The last possibility is that governments, exercising "control" in quite another sense, by legal powers, by persuasion or by intimidation, should prohibit the exportation of some raw material to foreigners at large. Here again, however, the web of connections in international trade has so many and such complicated meshes that a government would scarcely think it worth while to discriminate against the one or the other country by refusing to sell to it whilst freely selling to others.

(2) *Control in War-time.*

Here "control" of a sufficient quantity of a raw material again means that somebody, generally a government or a group of allied and associated governments, may decide where the raw material shall go, in what quantities and at what prices. The history of the last war provides many examples, and the next one will probably do so again. But the essential element in this form of control is not ownership, but military and sea power. The Allies of 1914 to 1918 controlled nearly all the raw materials of the world (with the exception of those produced between the German-Austrian-Hungarian-Bulgarian-Turkish front lines) because they "ruled the waves". Control during a war of a raw material is, therefore, secured when two (and only two) conditions (or their equivalent, as, *e.g.*, successfully black-mailing or bribing neutrals) are fulfilled :

- (1) Production must be outside the reach of the other party to the war, and if possible within one's own reach, from a military standpoint.
- (2) Transport must depend on the would-be controlling power or group of powers only.

It is only a negative form of this if a country, without being able to get any of the material in question for herself, is able actually to cut off the enemy's supplies by sinking his ships, frightening or bribing neutrals to enforce embargoes on exportation, etc.

So control in war-time boils down to geographic and military factors. Ownership, holding of share majorities or influential minorities has scarcely anything to do with it. Iron ores from German-owned mines in Morocco went freely to France during the Great War; the "enemy capital" was ousted from its "control" in a moment. So the owners had not even to decide whether they preferred to be good patriots or good business men. Seizure of their capital in enemy territory protected them from all the tortures which men have to suffer who must choose between such a Scylla and Charybdis.

(f) Security of Transport in War-time.

Before leaving the subject under discussion at the moment, viz., the self-sufficiency of certain powers in certain raw materials, we have to add one thing more.

Our lists are based on the assumptions :

- (a) That every country, even during a war, rules the whole of her territory and enjoys liberty and security of transport within that territory ;
- (b) That those countries depending for supplies, partly or entirely, in peace-time, on their colonies, enjoy free and safe transport from the colonies to the mother country.

These assumptions are certainly unreal to a certain extent. Experience alone can show to what extent. Let us hope that the point will remain open for ever, because of lack of future experience !

(g) Stocks and Scrap Materials.

A country preparing for the possibility of a war, and believing that it may be cut off from important raw materials, can, of

course, lay in a stock against such a contingency. To a certain extent this is done automatically by the normal activities of peaceful business life. Every branch of industry holds certain stocks at all times and does not live from hand to mouth. Much metal invested in peace-time in nickel coins, brass buttons, copper roofs and jewellery (gold, platinum) may be seized or collected by the government and used for new purposes. The more investment takes place, the more a long period of peace makes nations wealthy, the better will they be able, in war-time, to live on scrap materials like wedding rings, copper cables for long-distance transmission of electric power, statues of conquering generals,¹³ etc.

Mr. Emeny gives a number of interesting and meritorious data on the importance of scrap material as one of the sources of these metals to the United States in the case of a forthcoming war or in the case of that country becoming involved in other people's wars and so cut off from foreign resources. He calculates, *e.g.*, the requirements in manganese metal for a two-year emergency at 1.58 million long tons of ferro-grade (metallurgical) manganese ores. Of these he assumes, following official American estimates, 100,000 tons of metal to be available from bonded warehouses. He adds 30,000 tons in the hands of consumers, so that he balances these 130,000 tons of metal against the 643,000 tons of metal content of the ores required. For nickel he computes the quantity necessary for two years of war at 48,000 tons of metal. As against this Mr. Emeny puts :

TABLE T70.

NICKEL IN WAR-TIME IN THE U.S.

Stocks in hand	12,500 tons	
Recovery from coins and ferrous alloys	9,500 tons	(29% of the whole requirements)
Recovery from steel scrap	14,000 tons	(29% " " ")
	36,000 tons	(or 75% of the whole requirements)

For tin the total requirements are given as 70,000 tons, of which 60,000 or six-sevenths can be got from scrap materials. For antimony the requirements are 84,000 tons, secondary recovery 31,000 tons, etc.

¹³ This is why it is so much more patriotic to erect artistic atrocities in the shape of monuments to dead heroes and rulers in bronze than in marble. The time is past when cannon balls could be turned out from stone, at a pinch.

Now what is true of a country with such a fantastic use of metals as the United States is not necessarily true, to the same extent, of other countries. Though Mr. Emeny is cautious in his endeavours not to underestimate the war-time needs, we cannot be sure either if his assumptions are true or if his "two-years" emergency will be sufficient. But whatever the opinion of the critic as to the figures of the individual case, it is certain that scrap material is at least an additional factor affecting security in all calculations of supplies of war-time materials.

Another item must be mentioned here, though it proves still more elusive the moment we try to grasp it quantitatively: the laying-in of stocks by governments, directly or indirectly. They do not tell us, of course; but it is probable that most of the governments of the Big Seven cannot entirely have missed the golden opportunity of the years 1931 to 1936, when metals were dirt cheap, to pile up some stocks. Though their size is an unknown magnitude, these stocks are a factor which should not be totally skipped in a review of the situation.¹⁴

One last remark, and we are through. Our statistics of production have the one great drawback, however reliable they otherwise may be, that they do not tell us of those cases where lodes of an important ore exist in a country and which were not mined because at the prices prevailing from 1919 to 1937 it was not good business to mine them (low-grade, inaccessible or difficult ores) but which were used to a large extent during the four war "emergency" years and may be used, together with others not mined during this time, in the next "emergency". It will cost money, materials and men to develop such productions again. It will take time; but done the thing can be, and in so far as this is so the situation, as given by our peace-time statistics, is, perhaps, in some cases slightly, in other cases totally leading us astray. We know quite well that a nasty source of error looms here in all our inquiries; but though we know it we cannot do anything else than be so well prepared as not to be surprised by a surprise.

¹⁴ This applies to wheat and some other foodstuffs also. What a boon and a blessing might it not have been to the Canadian farmers, banks and governments, had the British Government bought up the Canadian carry-over of wheat on December 31st, 1934, to the tune of 5,800,000 metric tons at the then prevailing price of RM. 70 per ton. It is quite possible to-day to think of a thing like this; see further.

D.—THE UNREALITY OF IT ALL.

We have taken use in war-time as the prototype of the use of raw materials for non-economic purposes. It is certainly by far its most important form. Perhaps some reader will think that "non-economic" is a misnomer. In a sense it is ; and if I had had to coin the terms used in this inquiry for the first time I (so I hope at least) should not have made it. But it is there ; is widely used ; is not particularly misleading—and contains even a useful hint of what the investment of raw material in armament and warfare really is. And I should like to say that in this regard the expression seems to me to sin on the side of understatement in a very serious sense. For this whole discussion, necessary as it is because it employs the minds of so many and so influential people, is truly totally unreal and absolutely misleading.

We have now heard something from the mouths of eye-witnesses in Ethiopia and Spain about what aeroplanes can do even when used in small numbers and hampered by scarcity of ammunitions and fuel and by dispersion of objectives. There was a time when Mr. Haldane and Miss Woker could fight publicly on whether the new weapon was devastating or not. These things are clear now, cleared up by experience. What the aeroplanes seem *not* to do with certainty is to shorten war if they are used in something like equal numbers on both sides ; but when they swoop down on large towns they will blow them to smithereens and burn them in huge pyres. They will cut off inland transport, bring down factories, incinerate pitheads, sink ships and drive mankind from towns and cities into the starvation of comparative scarcity in the country where there are no targets worth a bomb and a gallon of petrol. It is, indeed, as Mr. C. E. M. Joad, always an outspoken, but also always a conscientious author, says in his review of a book in the *New Statesman* of February 20th, 1937 :

" Within a few days . . . the gas and electric light systems will have broken down, there will be no ventilation in the tube tunnels, the drainage system will have been thrown out of gear and sewage will infect the streets, large parts of London will be in flames, the streets will be contaminated with gas,

and hordes of fugitives will spread outwards from the city, without petrol for their cars or food for their stomachs, pouring like locusts over the country."

A real modern war will extinguish victor and vanquished alike ; it will be only a minor anxiety whether or not their raw materials will hold out for two or more years, for just one week longer than those of the enemy. Who knows which country will be conquered by the other ? Perhaps the wide areas of Russia or the remoteness of the United States may make it possible for them to survive. But they will have lost the sources of innumerable purchases, the buyers of enormous exports. They will survive like overgrown heads on the body of mankind that has dwindled to dwarfish smallness. A new war will be an *auto-da-fe* of the most fantastic kind of European and, probably, Indian, Chinese and Japanese mankind. After a century somebody will dig up a copy, surviving by a mere whim of fate, of all our wise inquiries into the impact of the international distribution of raw materials, and as none of our contemporaries will survive *and* read scientific books afterwards, nobody will be the wiser, and nobody will find out by experience whether we were right or wrong in our endeavours to forecast that impact.

All this glib talking of self-sufficiency, whether or not it will be there in war-time, even that of the most sober, the most critical sort, has one distinct danger : it helps to keep up the atmosphere of unreality which is created by taking such problems seriously. The moment the occasion for these problems really turns up it will abolish the brains to which they are problems and without which all problems are just dead letters mouldering deep under smouldering ashes.

This whole debate on raw materials in the next war rests on a total impossibility, turns round and round an entirely empty fiction. Not even the historic statue of the " economic man ", Mr. Gradgrind in Dickens' *Hard Times*, is such an empty show. All this is a tale, told by an idiot . . . signifying nothing, though chock-full of sound and fury.

E.—THE CLUSTER OF REAL PROBLEMS

We believe we have dealt with some of the more important fallacies of our subject ; to mention only a few, we will remind the reader of the following :

- (a) The importance of colonial productions ;
- (b) The particular poverty of the " Have-Nots " ;
- (c) Exploitation of the consumers by restriction of output ;
- (d) Damaging the consumers by embargoes on exports ;
- (e) Export discrimination against some nations in peace-time ;
- (f) The meaning of " control " .

Our list of proved red herrings is, as we see, quite a nice one already. But an important task still remains, viz., to show the real problems underlying the state of deep-rooted and terrifying uneasiness as to raw materials in international life. There is quite a cluster of such problems, and to exhibit them and to show in which direction possibly their solution may be found becomes doubly necessary after this first pricking of a few bubbles.

CHAPTER V

THE RATIONALIZATION OF THE DISTRIBUTION OF RAW MATERIALS

HISTORY often moulds human affairs in a manner which we, looking at things afterwards, feel to be extremely unreasonable. History is stupid. Well, history, after all, is an abstraction only, and to accuse an abstraction of stupidity or vice is certainly no more than child's play. But underneath this hardly sensible vituperation against a mere abstraction lies, dim but real, the *ex-post* understanding that endless bloodshed, epidemics and starvation, with all their ensuing unhappiness, might have been avoided, if history had been formed by the actions of human individuals and nations in a more reasonable way.

Now it is, to a certain degree, comparatively easy to know in the aftermath of an historical period what might have prevented the swooping down upon us of a "*great time*" (great times meaning, generally, times with a particularly high quota of bloodshed and starvation). It is true that conjectural history *ex-post* is speculative and uncertain also, to a degree. But as long as this speculation does not take the form of ruminating over such questions as what might have happened had not Madame de Pompadour enjoyed the favours of royalty in 1755, such a review of the past has at least one fact in its favour: viz., that the historian is sometimes able to know important facts better than the persons acting at the time.

All the same, if people refuse the advice of reason in the conduct of their day to day affairs, they throw away opportunities of avoiding catastrophies. Now it is certainly not the fashion to-day to believe in the ultimate usefulness of reason, because we have learnt that reason is sometimes extremely weak, almost powerless. But does the state of the economic and political affairs of the world look as if the retreat from reason

RATIONALIZATION OF THE DISTRIBUTION

(as Mr. L. Hogben has called this supreme vice of the present) had brought humanity nearer to paradise than the old, dry, unfeeling, reckoning way of crafty politicians? It was popular, for a long time, to disparage the wisdom of the method of regulating Europe created by the Congress of Vienna. But does not that method of regulation, with its comparative stability and peacefulness, compare rather favourably to-day with the outcome of the one-sided conferences of the Allied and Associated Powers at Versailles? And do not tell us that the statesmen did not know, could not know, what they were doing at the latter conferences. Never, as far as our knowledge goes, was the voice of reason raised so clearly, so insistently as by the leading economists of the day, with Mr. J. M. Keynes as their choragus. Never was their advice so wilfully, so deliberately spurned, as by the Big Five in their clandestine brooding over the problem of how a cluster of splendid principles, the principles proffered by Mr. Woodrow Wilson, might, by typical sham rationalization, be used as a mask for the most shameful and headlong race for electoral successes. Reason, in this case, has taken a terrible revenge.

The retreat from reason is the real cause of the economic and political mess in which the world is sunk to-day. And it is a mess. Let nobody be deceived by the fact that a new boom of the old sort is just in course of following the great depression. This boom will be just as short-lived as the last one. It will not be controlled in time. It will bring happiness and wealth to a few only, and it will rush us onwards headlong into the next slump. Now capitalism has shown a power of survival which has, rightly, astonished many a politician and economist. But its power of resistance is not unbounded. Even many people who, like the author of this booklet, do not fear but positively want a socialist transformation of society, do not wish to reach a very doubtful form of dictatorial socialism by way of an earthquake, a violent disruption, do not hope to see more helpless hecatombs slaughtered on the altar of equality. They hope passionately for a reasonable and, if necessary, slow transition from a system which, though unjust and in many regards exploitative, has certainly not been sterile even for the poorest of its members. They do not believe in the gospel of "After us the deluge of the great bliss of equality," because,

after all, they do not even feel sure that they may see that great bliss emerging from the deluge. So the policy of blazing a trail towards socialism through a series of slumps and depressions does not attract them. A policy of peaceful, gradual transformation remains for them the best one, even if the author of the slogan of the inevitability of gradualness forgets his own gospel for a moment when he dwells under the dazzling light of the Russian upheaval.

In economics the appeal of reason should perhaps be stronger than anywhere else. Let me say this in the words of Lionel Robbins (*An Essay*, etc., p. 157) :

“ . . . in the last analysis Economics does depend, if not for its existence, at least for its significance, on an ultimate valuation—the affirmation that rationality and ability to choose with knowledge is desirable. If irrationality, if the surrender to the blind force of external stimuli and uncoordinated impulse at every moment is a good to be preferred above all others, then it is true the *raison d'être* of economics disappears. And it is the tragedy of our generation, red with fratricidal strife and betrayed almost beyond belief by those who should have been its intellectual leaders, that there have arisen those who would uphold this ultimate negation, this escape from the tragic necessities of choice which has become conscious. With all such there can be no argument. The revolt against reason is essentially a revolt against life itself.”

All those who stand for a greater measure of planning as the foundation of the economic order of the future will, I hope, understand, that they cannot damn reason in the morning and expect all their hopes to be fulfilled by it in the evening. So the question of what would be a rational international distribution of raw materials, under present conditions in this world naturally, is the next step in our inquiry.

Rationality concerns, in the first place, production. Technical progress over the last few scores of years has been so astonishing that, in a literal sense, we can make almost anything anywhere, provided we are allowed and able to do it irrespective of cost. We can grow bananas in hothouses near the polar circle—if we are prepared to pay for it ; we may see oranges ripen in the hothouses in Kew Gardens, certainly far outside the “ natural ” limits of citrus-cultivation. We can

produce substitutes of entirely satisfactory quality for nearly any important raw material, if we do not grudge the money required.

But it is certainly not economically rational to do these things. There is a sort of substitute rationality, however. For example, let us take the case of a country without coal of its own, but which could produce electricity cheaply with the help of imported coal which it can easily buy. Such a country may very well resolve to do nothing of this kind. It may decide to make electricity with the help of water and wind—at three times the price it is true, but in independence of the importation of coal which might be interrupted in war-time leaving the power stations without steam. Safety in war-time is a very important non-economic element in “substitute rationality,” and we shall not overlook it ; we shall discuss its impact on our problem later on. But in the meantime we have to discuss the rationality of production from the narrower, more elementary viewpoint of economics. The same is true for rationality of use. Maybe in the end we shall find that rationality from the economic point of view is not the decisive factor, that other “substitute rationalities”, distinctly irrational from the economic point of view, take pride of place. But the economic inquiry comes first ; if we throw it to the winds, let us know at least whether we throw away a bushel of chaff or of grain, and how valuable the grain is we are tipping into the dust-bin.

One of the factors of rationality which we must not forget is the economic interest in comparative stability. There is, of course, an economic policy aimed at the cultivation of stability for its own sake ; and with all its advantages it may become too expensive, it may become too overwhelming, it may degenerate into stagnation. But though this danger is certainly more than a mere day-dream, stability is not quite the sterile nightmare which one might at first suppose. The enjoyment of life as well as the achievement of great enterprises depends, to a large extent, on whether, in our economic forecasts which we, perhaps a bit too proudly, call economic plans, important factors in the near future can be counted on with a reasonable degree of probability. If we widen the term stability somewhat so that it includes the possibility of forecasting inevitable future changes with a fair degree of reliability, the idea of

stability in economic relations and conditions becomes one of the leading features of our investigation.

A.—RATIONALITY OF PRODUCTION

Ores of the same metal occur, as we have seen, often in only a few, but widely separated parts of the earth. And in some such cases our need for these metals may be so strong that we wish to see all these places develop their production fully. But there are other cases where many countries have supplies, but where we have a choice between two possibilities: (a) the development of production on the basis of the lowest cost, or (b) its development on the basis of stability.

The first will increase the possible range of consumption, but at the same time the districts of cheap production may be fully able to provide for even this increased consumption. The production of copper is a case in point. There seems no doubt that even the least favoured copper ore mines in Northern Rhodesia can produce copper as cheaply as the lowest-cost mines in other districts. The full use of the "best source" seems to be of common interest to mankind, and we find that this theory of far-reaching international division of labour swept the field in the battle for free trade between 1800 and 1850. Then the idea was prevalent that, if we would only go deeply enough into the matter, we would always find that every country had a few things which, for "natural" reasons, it could produce better, *i.e.*, more cheaply, than any other country in the world. The inference was—let each country concentrate its producing activities on those industries, and let each exchange her surplus of these products for those which other countries, on their side, can produce more cheaply. Nobody would advise a country, the free-traders used to say in a manner sure of its impressiveness, to develop expensive coal mines in one province if it had large, adequate, low-cost coal mines in another province. Why should we think wrong, in the case of international division of labour, what we think right in the case of division of labour within the same country? Frontiers are, after all, only artificial things, nearly, if not quite, fictitious, though they cost us enough; let us, they said, be reasonable at least in matters economic, let us disregard frontiers at least in these matters, let us produce cheaply, as cheaply and therefore

as abundantly as possible everywhere, and equalize the natural inequalities in production costs by international exchange on the largest scale necessary.

All this is true. I think that in principle this case cannot be disproved within the field of economic rationality, provided that in comparing costs the full cost is counted on both sides, and that no important items are forgotten. There are two items which seem particularly important, though it seems to be rather difficult to appraise them numerically. This difficulty, however, does not justify those who simply neglect them.

I.—*Dis-investment ; the Gospel of the Cheapest Field.*

It is not only sentimentally difficult to scrap an existing producing unit when it becomes weak in competition ; the loss of investments is generally rather a serious one. And the loss on investment is far from being limited to the capital immediately serving the production in question. Let us take one example only, but one which has been and is still of very far-reaching importance for the economic policies of the world.

The production of grain for food and for fodder is much more expensive now in those parts of Europe where it is cultivated on a large scale, under technical conditions of extremely intensive production and high yields per area unit, but at the same time under the economic conditions of the law of diminishing returns than in many countries outside Europe which have developed into large-scale competitors, working under entirely different technical and economic conditions. The latter produce with the application of a minimum of capital, and farm extensively. They do not restore to the soil either by the application of organic manure or of fertilizer what they take out of it by the annual harvests. They "mine" the soil by cultivation, and they export its mineral wealth and its organic richness in the shape of the corn, cotton, wool and skins overseas. The European producers of surplus grain and wool did the same themselves—several centuries ago. This devastation of the natural wealth of the soil does not appear as an item in the costs of capitalist agricultural production. As long as an increasing population is one of the qualities of a capitalist society the increase in money value of the land compensates, and for quite a time even more than compensates, the loss of

value due to the decrease of natural fertility. As long as this condition persists, the territory where the soil is "mined" by cultivation is a very strong competitor of the territory where all the arts of modern conservative agriculture have to be applied and all the money necessary for the application of these devices has to be spent.

There are two possibilities open to countries where the soil has reached a naturally low level of fertility: either the country can begin a well-ordered and consistent retreat from agriculture, or it can try to keep it in existence.

The first system was followed in Great Britain. There the less good soils (which, of course, felt the competition of America first and worst) went gradually out of cultivation and only the better soils were worked. As time went on the "poorer" soils in this sense became a larger and larger, and the "better" soils became an ever smaller, proportion of the total arable area of England. The retreat was a gradual one, and in order to achieve it Great Britain had naturally to export something. She exported at first the surplus and then the substance of the agricultural population of Ireland, and then began to export the surplus and later the stock of the rural population of England herself. She could do this without creating artificial crises of the first order, because she had a century or so to do it in; but a long chain of individual bankruptcies, and a huge account of individual misery, were the inevitable concomitants of this development. Whatever the political implications may have been (we shall discuss them later), the social consequences were that England paid for this retreat from agriculture with an urbanization of her population which is deeply regretted by many, and with the silent, but for all that very real, misery of millions of emigrants. After a century of such experience the British nation was, to say the least, thoroughly dissatisfied with it, and we see now hectic endeavours being made to turn the tables and to reconstruct a rural, *i.e.*, an agricultural, population comprising a higher (as some like to say, a "more natural") proportion of the British nation. It is difficult to say whether this endeavour will be successful, and at what cost. But it is quite certain that anything which may be achieved will be extremely expensive and will take a very long time.

The same choice which lay before the British statesmen in

1846 had to be made in Germany in 1878. But Germany made a different choice : she chose to keep her agricultural population alive "artificially" as best she could. For that purpose, she drove up the level of selling prices of all sorts of agricultural produce so that these covered the cost of producing under the new technique of intensive cultivation, subject to the law of diminishing returns. She built a huge fence of protective duties round herself, and the consumers had to pay while they ate for keeping a large peasantry and semi-feudal aristocracy alive and at work. Many people now advise the Germans to pull down the fence or at least lower it, and to allow foreign food and fodder to compete in German markets on equal or nearly equal conditions with German-grown food and fodder. This advice certainly has its attractions. It would simplify and ease the economic situation of the world to a large extent if Germany opened her frontiers to U.S., Canadian and Argentine grain, fed her population at less than half the price at which they are fed to-day, and could lower her industrial protection as a result of this great decrease in an important item in the cost of her industrial production. But nothing is gratis in economic life ; a price must be paid even for the most wholesome reform. And the price in this case would be the immediate exportation of many millions of her agricultural population. But this could not be done. It would be extremely expensive, and would really, in its political implications, be the beginning of a revolution which would certainly not secure the necessary political support, not to mention all the other reasons why such a mass export of Germany's peasantry is absolutely out of the question. To do it gradually, to spread the misery over a century, is not economically possible to-day. The British example and the deep disappointment with its results after a century of pride and jubilation is certainly not an encouragement to imitation, especially in the absence of the most important condition which enabled comparative success in the British case, viz., the possibility of spreading the movement over a century.

And if we imagine agriculture as it will be in the world of 2000 A.D., is it so sure that it is the right thing to make, over and over again, whole nations rush to and fro from the cheapest producing area of to-day to the cheapest producing area of

to-morrow ? After all, even American soil is not inexhaustible. Every attentive observer in the United States can see that it is becoming rather quickly exhausted. Where is the agriculture of New England to-day ? Where are the deep fertile soils of the cotton belt ? Mr. Secretary Wallace and his scientific helpers think of taking a hundred million or more acres out of agriculture, because the soil is already so exhausted that it cannot any longer be worked profitably under the conditions of extensive cultivation. Where is the natural fertility of the *Chernosiom*, formerly so famous ? Gone, gone, gone ; eaten up by the inhabitants of Western Europe to whom the Russian *mujik* exported the wheat and rye which the Tsarist régime extorted from him. This game with Nature, this robbing of the soil, goes on till the soil is empty. Then cultivation simply has to be stopped, or at best it can be shifted. Shifting cultivation is regarded as one of the most characteristic features of native African, as we like to say “ backward”, tribes ; well, is there really much difference between the shifting cultivation of the Shilluk and the shifting cultivation of the Alabama share-cropper ? Is it really very different, when the Shilluk goes a few miles farther into the primeval forest and leaves the field he had cultivated denuded, exhausted and a prey to large-scale erosion, and when the white or coloured farmer cultivates the plains of Georgia, Alabama, Mississippi, robs them, and leaves them denuded, exhausted and the victim of large-scale erosion and passes on to Oklahoma and Western Texas ? The only difference is that, whereas only a few thousand Shilluk are at work in this way, millions and millions of American people have adopted this procedure. Within the last forty years, Canada, the Argentine, Australia and New Zealand have been attacked in just the same way as the plains of the Middle West and South in the U.S. Are we too enterprising in our speculations if we say that probably in forty or sixty years’ time mankind, growing at the rate of 1 or 2 per cent. per year, will have exhausted the natural fertility of these areas and will be faced with the end of virgin soils on the globe ? There will then be reached a new phase when the existence of widespread, old-established experience of the most intensive forms of cultivation will be a question of life and death for millions and millions of mankind. But where would this experience be found, if in the

meantime the plough seeks the areas of cheapest production and the farmer follows the plough ?

2.—*Mono-Cultivation ; the Gospel of Specialization.*

Some countries have had outstanding success in the production of particular commodities and have, therefore, more or less thoroughly specialized in them. Sheep on the plains of Australia, grain on the plains of the Middle West of the U.S., cotton in the Old South, cotton in Egypt, cocoa in the Gold Coast : these are some examples. This tendency towards specialization would probably, in quite a number of cases, have been effective to a much larger extent, had not the intentional activities of governments diverted the development of many districts from their " natural " course. The reason for these governmental activities was that it is never very wholesome, economically, to have all your eggs in the same basket. It is true that most branches of human productive activity pass, from time to time, through critical phases as, *e.g.*, during the last slump and depression. But in quite a number of cases depressions have hit only one or the other branch of agriculture, mining, etc., at a time, so that a district or country which enjoyed a certain diversity of economic activities did not find itself with all its population simultaneously unemployed, near bankruptcy and in need of relief. This is doubly true of agricultural districts, where the fact that ordinary foodstuffs of everyday consumption are grown enables the population, even in times of extreme distress, to get along without the most severe sufferings. International division of labour, driven to its last extreme, would increase the number of instances of monocultivation to an unreasonable extent. Thus additional centres and periods of acute distress which could be avoided by diversification would probably be created. It does, of course, cost money deliberately not to develop exclusively that branch of economic activity which pays by far the best, but to devote part of the capital, the soil and the labour of the population to the production of commodities which, in the ordinary course, are less remunerative but which are beneficent buffers in periods of difficulty and which may even, sometimes, prevent the occurrence of terrible famines, etc. Such a policy is of great importance from the political point of view, even for nations which

remain neutral in a great conflict. Good earnings in "normal" times do not always fully compensate for the enormous risks and dangers consequent upon extreme international division of labour.

One may, if one likes to, call the cost of this uneconomic "artificial" diversification (I am quite prepared to allow any disparaging adjectives people like to apply to such an activity) the cost of insurance. It certainly is very similar in principle; and by simply stating this analogy it becomes clear that, if the principle is allowed, its consequences must also be accepted. Here again people can have the apple only when they do not eat it.

One of the consequences, often enough, is, that the types of production which are fostered for safety's sake pay only under "artificial" conditions, namely, with a level of prices buttressed artificially by subventions from the public exchequer, etc.

The principle that only the best productive resources should be used is one which, in international life, must be subject to certain limitations. How far one or the other country is prepared and even willing to carry this interference with strictly economic activities will depend largely on the opinion of the moment. But it is not even certain that such interference really is "uneconomic". Postponed cost is not avoided cost.

B.—ECONOMIZING LABOUR

There was a time when people believed the funds of labour available for satisfying the economic necessities of society, at least in peace-time, to be practically inexhaustible. Now it is quite certain that to some extent this is true even for the present, and it was even more true for the past. Economic history does not provide many examples where a shortage of labour has been important, though some examples are certainly spectacular. But if we inquire into the reasons why this is so, we find that in the past there were at work at least two factors which no longer operate so much as a matter of course.

The first one is that people did not very much object in former times to the average quantity of labour done by man, woman or child being increased beyond the usual limit when their increased activities were provoked by increased wages. In this respect things have changed since the well-being of even

the majority of the working class has so much improved that the marginal utility of additional wages has definitely decreased. For to-day public opinion views the matter quite differently. The reasons may vary ; some people think of the danger of spoiling a full harvest of sturdy recruits for the army ; others think more of human dignity, etc. But whatever the motive may be, it is quite certain that the simple extension of the working day according to the current necessities of economic life beyond a certain maximum is no longer approved of, and that even the attraction of extraordinarily high wages may often fail to provoke that increase of the fund of labour which those offering the better pay want.

The other element which does not fit into the well-known and here certainly very necessary formula : " other things being equal," is that population does not respond in the old manner to the stimulus of high wages by undergoing a corresponding increase. Birth control is revolutionizing the world. There was a time when scientific discussion of whether it was true that improved wages meant only increased breeding of the working class and increased survival of their offspring was not quite without meaning. Nowadays, the number of children has become small enough in many countries to inculcate into the most boneheaded governments the fact that it may be good business to spend taxation money on seeing that children, once conceived and born, do not die prematurely, before having contributed by their own work to the necessities of society. And I think the class of workmen's wives who bear children as often as the men's sexual strength and the women's physical strength will allow them is dying out very quickly. It may be that, within certain limits, additional income encourages the conception of a child here and there which otherwise would have remained unborn. Positive evidence in this direction is, so far, rather scarce and contradicted by much other experience, though the last word has, I think, not yet been spoken on this subject. But it is quite certain that if increased income tends to increase the number of children born to the working population, the margin of indifference to increases in income is also rather wide. Extraordinarily high wage increases are therefore necessary to provoke an even grudging response in the way of more children.

The old elasticity of the reservoir of working power has gone. It has become much more rigid, and will continue to do so in the near future as far as we are able to form any clear idea on this point. The necessity for economizing labour is, therefore, quickly becoming a very important and rather general feature of modern economic life.

It shows itself in many ways ; in the necessity for using the fittest labour for every kind of work, avoiding unnecessary transport of workers, day by day, etc. From it arise two problems which will come into the foreground more and more.

1.—*The Problem of the "Rest"*.

One of the most popular features in modern economic life is the careful selection of workers according to their faculties and the employment, wherever possible, of only the pick of possible candidates. The Taylor system provides an example of only one form of selection, though certainly the most impressive one. It is clearly to the advantage of productivity that every kind of industrial work should be done only by people particularly well gifted for it. But what becomes, once this principle is introduced into industry everywhere, of that large group of people who are certainly not particularly gifted for any special kind of work, but who, quietly plodding along, do work of quite undistinguished quality ?

2.—*Stability of Employment.*

The selection of workers according to their particular physical and intellectual gifts will have very different results at different times for the same individual ; the highest degree of rationality may, therefore, mean a large measure of instability in the lives of millions and millions of people. They may develop the psychology of eternal examination candidates.

All this poses new and enormous problems. If the interests of maximum productivity (which in most societies, even exploitative ones, is also, to a certain degree, an interest of the exploited class) prevail, its realization will mean the introduction of new sources of insecurity. So we find that the attainment of maximum productivity and of security of existence may become and are already to a large extent incompatible.

Between these two goals, therefore, reason has to choose its way. It certainly will have much to do to solve all the problems arising ; problems which may sometimes be the same for large parts of the world, and sometimes very special ones concerning particular countries or districts. Rationality may lead to different forms of production, and to different patterns in its international distribution ; moreover, ideas as to what is rational will change as time goes on, making obsolete to-day what yesterday was brand-new and the last word in masterful adaptation. When ideas concerning rationality in production conflict, shall we be content, in the future as in the past, to leave the decisions to chance, to the survival of the stronger competitor, or even to the arm stronger and more resolute in wielding the sword ? Or shall we try to avoid decisions by any of these means and to set deliberate and considerate planning in their place ? Shall we, courageously facing the accusation that we arrange matters economic "artificially" (artificial in economic life always means what someone else does), try to find a middle way between mere wealth and mere security, between mere productivity and mere equality, when these aims conflict with one another ?

The world has given, I think, a good and fair trial to the system of free competition among nations as well as between individuals. There is no doubt that this system of "simple freedom" (not quite as simple, though, I am afraid, as Adam Smith thought) has contributed enormously to the development of the productive powers, inventiveness, adaptability and thoughtfulness of mankind. But if it has done something to increase our powers of thinking forward for more than half a year, it has certainly also taught us to see, in the nick of time, that the system is about to overreach itself, that the unfettered forces of free competition have now such a choice and quantity of means of destruction at their disposal that self-destruction in a supreme victory threatens to be the ultimate outcome. We have managed to progress so much that progress threatens to manage us, to pull us helpless towards the destruction of the roots of our existence. We shall have to do something to stop this, be it even at some cost in productivity and rationalization. Features which can be expressed in terms of somebody's profits can claim no monopoly of rationality. Not all important items

appear on even the most truthful and complete balance sheet of an enterprise. The fact that we cannot express the yearning of the masses for security and a quiet life in £ s. d. does not detract at all from their vital importance.

C.—RATIONALITY OF USE

The appeals for freer access to certain raw materials which some nations make with untiring propaganda may or may not withstand cool criticism : their moral and political importance should, and perhaps will in the near future, depend largely on how the nations asking for such an improvement of their position want to use the raw materials. Of course, they will all use them only for peaceful purposes or at the worst for defence. No war is possible nowadays in which every party does not fight for defence, for the whole defence and for nothing but defence. Maybe in a regrettable moment of absentmindedness they swallow the vanquished enemy's territory as at Brest and Bucharest, at Versailles and Trianon. But, to my mind, the time has come when we do no longer want to run the risk of absentminded victory, when we do not want any longer to see victors, to hear or read of victory, when we want to live in peace and to prosper as far as a dearly-bought peace will allow us.

This is the first conclusion as to rationality of use : in future no demand for raw materials shall be fulfilled with the help of a future international organization unless the materials are credibly destined to be used only for peaceful purposes. Strategic reasons for wanting to have access to certain sources of raw materials are typically irrational and should carry no weight at all. If it were possible to arrange the international territorial distribution of raw materials so that every great power would be totally lacking in at least one material absolutely indispensable for modern warfare, it would be a good thing to reshuffle the maze of political frontiers so as to ensure such a crippling of every great, or would-be great, power as to make it impossible for them all, the whole rabble of them, to "defend" themselves. But this is only a dream, though perhaps a beautiful one. One of the terrible achievements of technical progress is that substitutes can do the service of formerly "indispensable" things in war-time. So we have to

discard this positive side of the idea of introducing rationality in use as an organizing principle for the new distribution of raw materials. Only the negative principle that nothing should be given to anybody merely because they need it "for defence" can be applied in trying to solve our problems.

As regards the processing of raw materials, the advantages and disadvantages possessed by the various nations in processing are very different. Some countries are particularly fitted for certain industries because they have developed a well-trained body of workmen and technicians and business men over a long period. Naturally the relevant raw materials would be used to the greatest advantage by these countries. But it is very questionable whether it would be right to help a country to achieve a monopoly or quasi-monopoly of production when it had in any case an advantage over its competitors. Monopolies in private hands sometimes sow the spirit of exploitation even in people who before were not so minded; and nations in international strife have, through their statesmen, a nasty habit of acting like individuals in this respect.

Another point in this connection concerns natural advantages in marketing. Marketing at the lowest possible cost is one of the few cases in which the interests of the producer and the consumer are generally identical or at least very similar. Every natural advantage in this direction should, therefore, be developed carefully by international action. Wherever private or national interests stand in the way of this rationalization they should be overruled. The problems of unemployment which would arise from such regulations would not generally concern large groups of people.

Here, again, we are not interested so much in the question as to whether natural advantages should be fostered so that rationality in the use of raw materials is increased far beyond what it is now, we are much more interested in those disagreeable and unfortunately rather numerous cases where interests of rationality come into conflict with one another. Then we have to choose between them, just as we have to choose whether motor-cars in a country shall use the left-hand or the right-hand side of the road, and the choice will be the more difficult if, in addition to the many other niceties involved, a certain degree of incommensurability exists between the conflicting interests.

(1) *Distribution of Investments.*

Where home production of a certain raw material is small or non-existent and purchase of the material might become difficult, investment of capital as a means of securing a supply has been, and still is, popular with many capitalists and statesmen. There have been cases when this method has been of some importance, and it might well be so again. But these cases will be exceptional. Those of which we have heard in recent times have been instances in which other interests, real enough, but certainly not connected with the international distribution of raw materials, have been the true reasons for such investments—for instance, the endeavour of some group of capitalists to acquire political control over a country. In such cases governments have favoured the foreign investments of their subjects. The history of oil exploitation has been made up of investment partly or entirely influenced by ideas of this sort. The interest of the British Government in Persian oil has been founded on the idea of securing a plentiful supply of oil for the Navy. But in view of the relative purchasing powers of the several countries competing for oil it is very doubtful whether one drop of oil has been diverted from the course it would anyhow have taken.

Another factor comes into play here: namely, that for the last forty years or so, with very few exceptions, the situation in peace-time has been basically the exact opposite of a shortage of raw materials. The few exceptions (the shortage of coal in Europe, 1919-1924, *e.g.*) should not be forgotten, but it must be made clear that they were really exceptions and chiefly after-maths of some war situation. In general, we may say that for the last two score of years or more now the world problem has been in no wise one of how to secure free access to raw materials to everybody who wanted to buy and had the wherewithals to pay, but how to get rid of the raw materials produced. The one important peace-time exception has been in the case of grain when occasional simultaneous bad harvests have occurred in all the important production centres. But though a serious shortage might have led to the limitation of exports to a particular country such a thing has not happened so far—and it is very improbable that it will ever happen. If, *e.g.*, Chile should want to withhold her nitrates from Portugal in peace-time and if, consequently, she should put an embargo

on their exportation to Portugal, the consequence would only be that Portugal would appear as a buyer on the London market. Even if the Chilean Government were such good friends with the British Government as to make the latter forbid the exportation of Chilean nitrates from the British Empire to Portugal, this country would only have to direct her demand to Paris or Rome or any other propitious country. As long as nations are not involved in war (and scarcely then, with international collaboration as weak and hesitant as it is now, as the example of the sanctions against Italy has shown), it is hardly possible to withhold a raw material from any country which is willing and able to pay for it. At the same time it is extremely rare for a country producing any raw material not to be utterly indifferent as to which of the several competitors for it get it in the end. Chile will certainly not jeopardize her good commercial relations with Portugal for the mere pleasure of favouring any country which wants, with the help of such a discriminating anti-Portuguese embargo, to buy Chilean nitrates more cheaply than she would be able to when facing normal Portuguese competition at Tacna instead of at Liverpool.

But in another sense the existing distribution of investments influences the distribution of the production of raw materials quite considerably: namely, in so far as the owners of investments throw good money after bad money to rescue former investments. In this regard it is necessary to think of the many agreements between capitalists (and often governments) which may be called international, because the capitalists who are parties to them belong to different nations and the enterprises themselves are situated in the territories of different nations. Here the entrepreneurs (and their governments, sometimes) may try to prevent changes in what are the centres of most efficient production from leading to shifts in the centres of actual production. This is the more understandable as very often new units of production owe their superiority in competition, at least partly, to the fact that some of the expenses incurred in order to enable them to start producing do not appear among their costs of production. Within the framework of capitalist society there are at least four such factors of great frequency which must be mentioned here:

(a) *Previous Bankruptcies.* In Bernard Shaw's *Heartbreak*

House poor Mr. Mangan gives some short, impressive lectures on the philosophy of bourgeois *entrepreneurial* economics from one of which we will quote the following :

“ Your father’s business was a new business ; and I don’t start new businesses : I let other fellows start them. They put all their money and their friends’ money into starting them. . . . They’re what you call enthusiasts . . . in a year or so they have either to let the whole show go bust, or sell out to a new lot of fellows for a few deferred shares. . . . As likely as not the very same thing happens to the new lot. They put in more money and couple of years’ more work ; and then perhaps *they* have to sell out to a third lot. If it’s really a big thing the third lot will have to sell out, too, and leave *their* work and *their* money behind them. And that’s where the real business man comes in : where *I* come in.”

It is one of the characteristics of capitalist money economics that the losses of all Mr. Mangan’s predecessors do not reappear in the bill of cost when Mr. Mangan works the thing ; though they are real losses (or, to look at it the other way round, part of the necessary total investment), they are borne by people who “ do not count”.

(b) *Depreciation of Debts* through depreciation of the purchasing power of money may have something to do with the difficulties of old-established enterprises and the advantages of new ones in competition, but this factor will generally work the other way round, the older business being probably more deeply in debt and therefore more likely to profit from falls in the purchasing power of money.

(c) *General Development Expenditure* will very often not appear at all, or at least only as a very modest quota of its real size on the costs bill of a new enterprise, particularly when such enterprises are located in newly-developed parts of the world. The expenditure involved in opening up the Katanga and Northern Rhodesian districts for copper mining has been borne largely by the Belgian, British and native taxpayers, and only to a very modest extent, at least during the years of development of copper mining there, by the entrepreneurs of these mines. Old-established mines, however, have to bear to the full their share in the tax requirements of the state in which they are

situated, and even taxes not immediately imposed on them may find their way back to them by the shifting processes to which taxation is prone. The wages, *e.g.*, which an old-established mine has to pay will somehow and to some degree make up for the direct taxes paid by the workman and for the indirect taxation he has to pay in the prices of what he consumes, etc.

(*d*) *First Robbing of the Soil.* The factor just mentioned is more or less of a temporary character, and so is a fourth one which is generally very important when new production is being established in a new place : *i.e.*, the phase of the first robbing of the soil. Nearly everywhere this recklessness in skimming the natural fertility of the soil, the natural cheapness of local labour, the natural richness of the best parts of a lode will enable the new business to show a bill of costs which will enable it to live even through lengthy periods of bad prices without coming seriously to grief, while the old-established centre may break down if it has to bear the unbroken brunt of the storm.

Nothing is more attractive, therefore, and even from the viewpoint of the interests of the community more reasonable, than to try to tide over these critical periods by artificially ensuring to the old enterprises at least a certain proportion of trade which allows them to stand the crisis. After all, the handicap under (*d*) is only a passing one, that under (*a*) does not affect the real cost of the new enterprise to the community, and (*b*) works, in the long run, nearly always both ways. This is why it is so difficult to blame all the international agreements of producers of raw materials in mining, industry, etc., for the establishment of monopolistic price policies and consequently for the stabilization of prices and enterprises, as long as their policy is one of reasonably forward-looking capitalist selfishness and not of reckless pocketing of momentarily seductive exploitation hauls.

(2) *The Web of Financial Obligations.*

This policy of tiding over difficult times by "artificially" buttressing prices by way of international limitation of production is made possible by the existing entanglement of financial obligations. It is not the best policy for a capitalist to put all his eggs in the same basket ; it is not the best policy for him to stick to his money in South American copper and to

disregard the new developments in Rhodesia. Whenever he hears of a new, really promising centre for the production of the raw material, he is interested in it. The best policy, naturally, for him is to put his finger into that pie also, be it even at the price of liquidating part of his former investments in the older copper mines. Then he can exercise his influence in the business policy of the new as well as of the old centre. What he may lose temporarily under the one head he will regain under the other head. It is really a form of hedging which we see at work here : maybe one forgoes some possible gains of a highly speculative nature, but one also avoids very serious risks, and the cost of the operation, if undertaken early (before the price to be realized by the sale of part of the old shares falls heavily), is not worth mentioning ; an insurance premium must be paid, if one wants to be safe.¹

This book is not meant to be a defence of the doctrine that the egotism of the enlightened capitalist is really conducive, in most cases, to the common good ; indeed, I feel very far from thinking this. But it is not good policy to deny that there are cases where this relation between the egotism of the entrepreneur and the common weal actually does obtain. In these cases the experience of the experiment in stabilizing the international prices of certain raw materials by private " conspiracy " (if you want to use the word ; I am not afraid of it) with the help of one or more governments is extremely valuable as a step towards the concerted international action which I think should provide a solution of our real problems. The real problems are : insecurity of prices and profits, and waste of limited valuable resources. It is quite certain that these two problems (which will, I hope, emerge as the real ones from this inquiry) cannot

¹ The point is well illustrated by a contribution by Mr. J. H. *Hammond* to Mr. *Crowther's* book (p. 86). He gives an enumeration of the spread of investments in the copper mining industry, from which I glean the following details : (a) The Anaconda group had (in 1932) copper mines in Montana and Arizona, U.S., in Chile and Mexico. (b) The Kennecott group had copper mines in New Mexico, Arizona, Nevada, Utah, U.S., in Alaska and in Chile. (c) The Phelps-Dodge group had copper mines in Arizona, U.S. and Mexico. (d) The American Smelting and Refining group held interests in copper mining in the U.S., Mexico and Peru. (e) There existed in the same year a certain American interest in copper-mining in Katanga. In addition to this one must take into account the fact that many minority blocks of shares in these groups may be held by people not included in those groups of capitalists which appear here as the " group." All this gives a picture, full of criss-cross lines, of the spread of interests in copper mining all the world over.

be solved for more than a moment except by a concerted and, to tell the truth, complicated and difficult international policy and organization.

But there is not the slightest doubt that these investment interests and financial obligations, though quite clearly private interests of a profiteering nature, are not only private profiteering interests and nothing more. They may be in sharp contradiction to the rational use of natural advantages in processing and marketing and to the existing distribution of skill and labour. Though this may be so, however, this simple fact of a contradiction between private and common interests is not sufficient reason for disregarding the one and respecting only the other complex of the conflicting interests; they are all different factors of rationality in the production and use of raw materials. They must, therefore, all be taken into account by an international organization which functions impartially as a court of arbitration and carefully smooths out those conflicts between the individual and the communal interests of mankind which stand in the way of a considered compromise.

All this is only a sketch of the framework of business life. It does not give any ready-made solution of any definite special problem, it does not even state definite problems. It would be much too early to do so, for two reasons: first, we do not know enough so far, for lack of a planned collection of material, about the individual problems, and secondly, their leading characteristics tend to change so quickly just now that even the truth of to-day may be the error of to-morrow. Only a court of arbitration of the kind already mentioned can do anything of a more concrete character, and even its existence presupposes the solution of some particularly recalcitrant problems which we shall mention in a later part of this essay.

The next step in our inquiry is bound to be a difficult one. We have, so far, more or less disregarded the political implications of our subject. But we cannot do that permanently. After all, economic activities are not, or at times, should not be, entirely an art for art's sake. And many of the political implications of our subject are not only manifestations of human unreasonableness which one has to deliver with willy-nilly; quite a few of them are reasonable in return or in themselves and need to be taken into account in seriously. The

impartial way. A realistic policy in these things does not only require that facts of a political kind, nasty as they may be, should be taken into account, but it also requires that the real impact of political complications should be clearly seen and respected in trying to blaze a trail towards a solution of these problems. We shall study the problems of peace and of war separately, including the problem of armaments in peace-time under the heading of war-time problems.

CHAPTER VI

THE POLITICAL PROBLEMS OF RAW MATERIAL SUPPLIES

A.—RAW MATERIALS IN PEACE-TIME

WE have seen that during the last forty years it has, most of the time, been at least as difficult to sell raw materials as to buy them. There are, therefore, two sets of complaints to be considered: those of the people who want to buy more than they actually can, and those of the people who want to sell more than they actually can. Let us take the first set first.

Many factors co-operate in determining what quantities of any raw material a nation can buy. The most important are the following:

- (a) The extent of their purchasing power;
- (b) The prices at which the materials can be bought;
- (c) The competition of wants for the limited amount of purchasing power at the disposal of any nation.

Now these factors are not quite independent of one another, nor are they primary factors at all.

1.—*International Purchasing Power.*

The international purchasing power of a nation depends, in the long run, on what it can sell or has already sold on the world's markets, the latter factor being of account only so far as the earlier sales were sales on credit. It is, of course, necessary to include services (like shipping services, tourist facilities, etc.) with the commodities sold. In some cases there is a third factor to be taken into account, namely, the obligation of one nation to pay another or others sums in money, or to deliver goods or labour in kind without getting anything in return or without having received anything on credit previously. The

amounts involved must be subtracted from a nation's purchasing power in international commerce. The most important such case is that of war reparations (in money or in kind).

A few years ago this item was a very important handicap on the international purchasing power of some nations, particularly Germany. But in 1932 Germany practically repudiated her reparations debt and is very unlikely to recognize it again at any time in the future ; so improbable is it, in fact, that we will disregard reparations as a factor affecting the future. The same is true of reparations as a source of possible international purchasing power. They did form such a source to a certain extent after 1919, but are so no longer and will not be so again. We may even take a further step. One of the ticklish points worrying many people in the United States is the future of inter-allied war debts. Huge sums are owed to the United States by the former European Allied Powers, but nothing (if we except Finland) is being paid or has been paid for quite a long time, and it is very improbable that payments will be made in the future to any extent worth mentioning.¹ It is quite easy to understand that a fact like this is hard to swallow, but our inquiry would only be muddled if we did not take as our basis the only view of the future which seems probable ; namely, that the United States will have either to write off the capital invested in loans to their former allies or go on carrying them from balance sheet to balance sheet as a perhaps decorative, but certainly bad, asset. In my mind it is always better to throw a bad egg into the dust-bin ; but if people prefer to have its smell in the larder there is no means of deciding who is right.

Nevertheless, the fact remains that the purchasing power of the nations in international commerce depends on their sales

¹ There is a big difference between paying for armaments and war by means of loans raised at home and loans raised in foreign countries. The choice is in both cases between paying, though with some postponement, out of the proceeds of taxation—and repudiation. Repudiation of a loan at home damages many subjects in the indebted state and creates unpleasant perturbation in the home capital market ; a government will take this course only as an ultimate refuge. To pay off a foreign loan would be equally difficult on account of all the complications and drawbacks connected with the one-sided large-scale transfer of money which would emerge, while repudiation would damage only other states' citizens, and the shock to international credit of the repudiating country, as experience has clearly and often shown, would be soon forgotten. Ultimately, of course, the capital of a public debt is hardly ever paid back. But it is quite clear that the possibility of borrowing abroad is an incentive to war.

and on their debts and assets ; and in some cases, for a longer or shorter time, on their credit. All these rivers pour their water into the same ocean of international currency relations.²

2.—*Payment of International Debts.*

The payment of debts in international life can be effected, in principle, in four ways :

(a) *By Migration.*

Migration of wealthy people from the creditor to the debtor countries may be mentioned first. It is a thing which, on a large scale, has never taken place and is quite unlikely to occur.

(b) *By Transfer of Currency Metal.*

The transference of precious metals is the second method of settling international debts. This method has been much used during the last 17 years. Its results may be summed up by saying that, after some wandering, the gold of the world is now collecting more and more in the treasury and bank cellars of the United States. The latter, since they have no other use for it, bury it as deeply as possible, not daring even to use it for the purpose of coining golden money or of issuing bank

² The extent of international purchasing power depends largely on the quantity of goods a country is able to sell abroad, and this quantity again depends to a large extent on the level of costs. Low costs help to sell a commodity or service easily in international competition on a large scale ; high costs are prohibitive in this regard unless they are lowered by all sorts of subsidies or other dumping arrangements. Now one of the large items in the costs of production of any industry is the level of taxation in the country of production, and this again depends partly on the purposes for which taxation is used. I take from Mr. *Bradley's* book (pp. 19-20) a few figures of the expenditure of important countries for military purposes in 1929, *i.e.*, before the mad race for armaments of these last years set in : Germany, RM. million 691 ; France, fr. million 10,969 ; Great Britain, £ million 99 ; Italy, lire million 4,934 ; Japan, yen million 268 ; Russia, rubles million 1,125 ; U.S., \$ million 703. These figures are now, of course, quite obsolete and far behind present expenditure, and they were probably incomplete even for 1929 (the figure for Japan, *e.g.*, is incredibly small). But they show that of these Big Seven not one has a right to complain of a lack of international purchasing power as long as it prefers armament and a high level of taxation to the other alternative. It is quite clear that only concerted international action, coupled with reliable international treaties, can offer a way out of this deadlock ; it is absolutely beyond one country's power to break away from it at its own risk.

This point has been worked out, with admirable clearness, in Dr C Delisle *Burns'* article "Guns and Grievances" in *One and All* of July, 1937. p. 131 *seq.* "I fail to see why there should be any international conference on raw materials to consider the claims of the "have-nots" while Italian and German policy in Spain and Japanese policy in China is what it is."

notes against the full amount of gold cover.³ As the quantity of gold existing in the world is finite, and as its production, as we have seen, is chiefly limited to a few countries, some of which (India in "normal" times, Russia even during the depression) manage to retain what they produce, this procedure will be bound eventually to stop to a large extent. Only a small quantity, such as is produced annually, may go on trickling into the United States in the long run. This will be so, of course, only so long as the U.S. does not resolutely turn over a new leaf and spend some of its gold in international commerce, so that the gold may return to it after a spell of playing truant.

(c) *By Sale of Commodities and Services.*

The next point to be discussed is the sale of commodities and services on the world market. In the long run this is the only means of acquiring international purchasing power. No

³ The international movements of gold, though still rather meandering, have shown since the end of the war a distinct one-sided tendency. Allow me to give a picture of the state of things and an example of how these things may be totally misunderstood by authors and by the public with the help of the following quotation and criticism of it. Mr. Samuel Crowther says in his otherwise quite interesting, though often much too sweeping, book *America Self-Contained* (the italics in the quotation are mine; pp. 218-219):

"In 1900 the world's stock of monetary gold was two billion dollars, in 1913 it was four billion dollars, and in June of 1932 it was 10 billions—using the nearest round figures. Of this stock the United States in 1900 held 511 million, in 1913 it had 1,290 million, and in 1932 it held 3,610 million dollars. *Thus the proportion of the world's gold held by this country has not varied greatly in the last quarter century.* That is not true of France. That country in 1900 had 451 million, in 1913 had 679 million, and in 1932 had 3,218 million dollars. Great Britain, in spite of being forced off the gold standard, has 663 million dollars in gold as compared with only 139 millions in 1900. Germany is the only one of the major nations which now has proportionately less gold than in 1900—198 million dollars as against 119 millions."

This quotation contains many dubious assertions, and the figures really need investigation. But besides this and taking the figures on faith, there is a lot to be said about Mr. Crowther's inferences. I have assembled in the following tables: (a) the figures contained in Mr. Crowther's text; (b) a number of complementary figures; these figures, marked a, I have taken from *Die Wirtschaft des Auslandes*, 1900-1927, those marked b from the same Office's Abstracts for 1936, and those marked c from the Abstract for 1935; (c) index figures for the absolute figures calculated by myself. These index figures tell us among other corrections of Mr. Crowther's assertions (32 years by the way, are nearer to a third than to a quarter of a century) that: (a) In 1932 four of the seven "major nations" had gold stocks which had grown at a slower rate than world stocks had grown since 1913 (a comparison 1900-1932 being impossible because of the lack of some data for Japan and Italy), and three of them showed even a clear absolute decrease. (b) In the same year three "major nations" showed increases of their gold stocks at a greater rate than the increase in world gold stocks. The largest index in that year was that for France. But since then she has lost much of her gold, at the end of 1935 the amount was down to 2,643 million \$ gold, while gold stocks in the U.S.

country which is not able to sell is able to buy. No country which refuses to accept other people's commodities and services can expect to get payment for its exports. Fundamentally, in spite of some minor complications which slightly (but only slightly) modify the working of the principle in practice here and there, it remains true that imports can be paid for only with exports, and *vice versa*. The quantity of any nation's exports does not, of course, depend only on the willingness of others to allow importation. The level of prices is another important factor in the problem. Every nation that wants to sell something will see that the volume of its sales depends on two possible price policies :

(1) *For exports of monopoly goods* the quantity sold will depend on the price, *i.e.*, the problem will be to find the

had further risen to \$5,977 million, so that we get (even without the further losses of France and the further gains of the U.S. in the meantime in spite of their being forced off the gold standard) the following second table.

TABLE T70a --INTERNATIONAL DISTRIBUTION OF GOLD STOCKS, 1900-1932.

	In \$ Million.			1900=100		1913 =100
	1900	1913.	1932.	1913.	1932.	1932
WORLD	2,000	4,000	10,000	200	500	250
U.S.	511	1,290	3,610	252	706	279
France	451	679	3,218	151	714	474
Great Britain	139	a 175	663	126	477	379
Germany	119	c 245	198	206	166	81
Japan (million yen)		a 286	a 426			149
Russia (million RM.)	b 2,256 ²	a 3,369 ¹	c 1,600	149	71	48
Italy (million RM.)		a 1,542 ³	c 1,290			84

¹ 1912; including a small amount of foreign bills ² 1898 and 1903. ³ Including gold in State Exchequer, against which State Notes were circulating

TABLE T70b. —GOLD STOCKS IN U.S. AND FRANCE, 1900-1935

	1935. \$ Million	1900 = 100	1913.
France	2,643	573	389
United States	2,977	1,168	463

From this it is quite clear that France's great treasure in 1932 was only a passing phenomenon, caused by the fact that she was, at that particular moment, slightly less distrusted in currency matters by capitalists than other countries. In the meantime the index figures for France have probably decreased to something like 400 and 200 respectively and those for the U.S. risen to something like 1,300 and 600 or so. But even disregarding the developments after 1932 (which Mr. Crowther might have guessed at, but could not have known) the first table, if we fill in the gaps left by Mr. Crowther's arbitrary choice of data and if we look closely enough at the figures to see their real significance, shows in nearly every point the contrary of what Mr. Crowther says in his text.

optimum monopoly price. This price can be found only by *tâtonnement*, by "trial and error", and the trial will have to be made again and again, because the demand schedule of the purchasing nations will change often and sometimes unexpectedly, and because the competition of substitutes, again a matter of price levels, may change in the same way.

(2) In the case of *exports of competitive goods* the price level will decide who, among the competitors, captures the markets. Success can be achieved either by curtailing home production costs as far as is necessary to capture the foreign market, or by selling deliberately at a loss, in the beautiful and not always unjustified confidence that either the home consumer or the home taxpayer, or both together in honourable co-operation, will fill the gap in the profit and loss account. A prevalent name for this last practice is "dumping" (but in international economic life a bad name does not hang a dog). "Dumping," in discreet and indiscreet forms, is a widespread practice in respectable bourgeois as well as in disreputable bolshie countries. The granting of particularly cheap railway rates for coffee in Kenya, for which the natives have to pay in enhanced freights for their necessities, is in principle just as much an aid to dumping as the formerly popular payment of export premiums to manufacturers by the exchequer.

Many states have done much to try to "put their export price level right", by means of pressure on wages, and on the employers to make them rationalize their methods of production and marketing, as well as by giving, more or less chastely, export premiums to those of their export industries which they wanted to develop. But other countries have, again and again, "called their bluff". Protective duties, embargoes, import quotas, anti-dumping legislation, anti-sweating legislation concerning foreign trade: all these are now like many stops on a complicated organ; the virtuoso knows when to use the basses or the *vox humana*, and he plays all the time, throttling imports, whatever the price levels in his and the other countries may be, exactly down to that particular point which he believes to be the optimum. So we have reached a point in international commercial policy where all the several technical features designed to overcome protective walls are frustrated by the art of wall-building. We may say without risk of being disproved by

experience that, if the protectionist states insist on using their protective powers till they die, nobody can prevent them by economic means.

3.—*Dodging the Currency Problem by Annexations.*

In the modern world nothing can be bought without money. In national economic life money is either earned or made. In international life the finest art of currency manufacture is of no avail unless you print banknotes of other countries ; and in spite of all the usual crudity of modern economic battling it does not seem likely that anybody will seriously think of doing this.⁴ But there is a substitute for the making of money for the purpose of creating artificial purchasing power in international life, namely, the annexation of territory. If government A wants to buy some raw materials from territory B it may annex this territory if it feels that it cannot otherwise buy any or sufficient of the raw material in question. The technique of creating purchasing power would then become applicable, because the producing territory would be part of the currency area of its new master. This is why those governments which speak for the "dissatisfied" nations are thinking of annexations and speaking of them as a vital right and are pursuing a practical policy in this direction whenever they dare. This is where our analysis of the first chapters of this booklet can usefully clear up the problem. We may confidently say that short of annexing half the world not one of the "dissatisfied" nations would be able to bring into her currency territory all those sources of raw material after which they hanker. If they were to try such a policy of radically remedying their lack of raw materials by indiscriminate annexation, the three chief dissatisfied powers would find that they were after the same thing in the sense that they would have to decide between them with respect to many a raw material which of them should get it and which of them go without it. This would only create a new set of "dissatisfied" nations, and instead of a new play being

⁴ The faking of other nations' (the enemy's, of course) money was a device not unpopular with famous kings in former centuries. But nowadays it has lost its attractions even in the most passionate wars ; it is a weapon which too dangerously cuts both ways. The only example where something of the sort seems to have been planned (though in peace-time) concerned Hungary ; and that attempt was killed in the bud.

given on the old, rather dilapidated stage, we should simply see the same play beginning a fresh run with another set of actors. And what about those not entirely negligible powers which are as yet unworthy, so it seems, of the name of great powers, but which might become worthy of it rather soon, namely, China, India, Brazil, Poland? They are, as our analysis has shown, individually in any case particularly badly off as regards their supply of raw materials. It is only a question of time before they will appear behind the footlights asking for an interesting and well-paid part if the old play is to go on. There is only one form of annexation which is in some sense "possible" (namely, in the sense that one can imagine it really happening, though the imagination must penetrate into rather dim precincts), the annexation of everything by everybody, the creation of a world state, and in respect of our immediate subject the creation of one world currency.

4.—*International Currency.*

Well, let us assume, for a moment, that instead of having as many currencies as sovereignties we manage to achieve a state of things wherein sovereignty is neatly separated from currency regulation; wherein a separate authority regulates all the legislative and administrative acts of all the world relating to currency, and wherein the making of money, the holding of reserves, etc., is regulated in one and the same manner for the whole world from one centre, whatever that centre may be.

(a) The Central Authority (hereafter called C.A.) would establish as its currency a particular unit, with certain sub-units, represented concretely by notes, coins or tokens. The unit could be either an artificial unit or a unit of some precious material. In both cases the C.A. would have to decide how many of the tokens should be produced (the decision might, of course, be—as many as the amount of precious metal presented for the purpose to C.A.'s mints allows). And the C.A. would have to go a step farther, either regulating the quantity of the currency metal to be produced in the future (probably only a maximum, not a minimum regulation being possible), or regulating how many tokens of intrinsically worthless material might be made and put into circulation. It would have to allot a quota of these to every state and prevent any state making

more than its quota. Whatever the currency policy of such a C.A. might be: inflatory, deflatory, gold standard, silver standard, bi-metallic, or what not, the consequence of having a world currency would be that the individual sovereign states would have to forgo the powers of regulating, managing and manipulating the currency within their own territory according to their own wishes and persuasions. If the monetary policy of the C.A. were inflatory the governments favouring deflation would have to tolerate a policy which disagreed fundamentally with their plans, and *vice versa*. No local political pressure would be able to influence such a government. The international applicability of the C.A. policy would have to be enforceable, if need be, up to the hilt.

All this is not a fundamental argument against the possibility and usefulness of a world currency. It only shows that it will take a long time to come, if it comes at all, and that a thoroughgoing change of mentality all the world over will be necessary if people are to avoid creating the permanent danger of the internal catastrophic disruption of this new system.

I do not propose to discuss further this idea of a world currency; not that it seems too Utopian to me. We have seen so many "Utopias" safely located on this globe now that this would be no real argument. But it is clear that what makes such a proposition appear so Utopian nowadays is the glaring incongruity between the spirit of sweet reasonability, which is its one unchallengeable condition, and the absolutely supreme spirit of egotistical unreasonableness which rules the world to-day. And the fundamental side of this proposal will turn up again when we try to work out the necessities for, and possibilities and means of, introducing a thoroughgoing education in reason.

(b) But do not let us forget that it does not follow as a matter of course that such international regulation of currencies would penetrate to the roots of the "evil" (if evil there be). Even under such a régime a nation might find that it was suffering from a lack of purchasing power for certain raw materials and that it could not acquire it except by creating additional money. Would the C.A. then allow that country in "distress" to create the "necessary" money? Even if quite a number of governments were to urge the C.A. to grant such permission, because they were in similar difficulties or because they wanted to

sell more, such a policy (not meant to be inflationary but which just could not help being inflationary) might go absolutely against the policy of the C.A. Even those who would be inflationists under certain conditions should not forget that the measure of inflation which they would find propitious might be the subject of differences of opinion between themselves. They also should not forget that we cannot absolutely eliminate from future possibilities a C.A. which would not be inflationistically-minded under any circumstances.

(c) There is, even from the point of view of the inflationist, very serious doubt as to whether the measure of actual inflation achieved should be allowed to depend on pot-luck, *i.e.*, on how much is necessary for the realization of purposes which have nothing, or very little, to do with the purposes and ideas which should regulate currency policy generally. Very few people would go, I think, as far as to welcome inflation wherever it raises its head. Inflationists may be divided, I think, into two groups: There are those who want inflation to be used as a general fillip to economic life in periods of (as they believe) money-caused depression. And there are those who, without going as far as that, propose inflationary measures because they want to anticipate future purchasing power and to finance the creation of additional employment. Though they do not want inflation for its own sake, they are prepared to put up with it if they cannot otherwise get what they believe to be a vital necessity for human society as a whole. But I do not think that there is any serious economist who when asked: "But how can we pay for building a dozen new water-power stations; the government has not got the money, cannot borrow it on reasonable terms and does not dare raise taxation to the necessary degree?" would coolly answer: "Well, let them print the money, and the devil take the consequences."

After the experience of the last twenty years it seems to me that the old theories of "sound money" are rather a sad heap of ruins, and that there is at least a *prima vista* case for believing that manipulation of the currency may, at times, be very useful and not over-dangerous. But no case has ever been put up for haphazard inflation; and this would be a necessary piece in the intellectual armour of those who expect from the establishment of a world currency a fundamental improvement

in the difficulties concerning the international purchasing power of any nation.

One side of the currency problem still remains to be discussed here, and one of very practical importance for the present day : namely, whether it is possible and how it is possible to improve the situation by making it easier for those who are too poor in international purchasing power to buy all the raw materials they believe to be vital for their economic well-being, nay, as they assure us, for their very existence, to acquire it by increasing their exports and/or restricting their imports of other things, in short by changing their balance of international payments.

5.—*Protectionism and Free Trade.*

Some ideas in economics are so simple, and such strong instincts work in their favour, that they always find an open ear. The case for free trade is one of them ; and it is a case which has been reinforced by quite a lot of experience extending over long years.

Some of the basic ideas of the philosophy of free trade have, it is true, lost their splendour in the course of time.

We no longer believe in the natural superiority of the stalwart average blockhead over a well-informed administration, and we know that even the most rabid free trader is bound to find that some economic activities will not be carried out at all unless the government does them. But this is not the plane on which the fight for and against free trade is fought to-day.

Now it would swell this book unboundedly and make it one more of the many rather unattractive tracts on free trade *versus* protectionism were I to try really to discuss the subject. But I think that three points are clear to-day and really beyond discussion :

(a) Much of the potential world production of raw materials must remain unused and unenjoyed henceforth if the present general system of blocking out others from one's home market is to be continued. This dog-in-the-manger attitude may be easy to understand ; it may be very convenient for those who do not like to overstrain their brains by trying to understand the elements of the mechanism of international trade ; it may go perfectly with the mental state of the average successful

politician, as politicians go nowadays, in democracies as well as in dictatorial régimes. But all the same it is true that if those countries which have positive balances in international trade insist on not accepting payment of these balances in kind they will not get anything and will rush the world headlong into a new crisis at least as deep as the last one was. I am thinking mainly of the United States, though not by any means of them alone. The story of the U.S. is told by the following table :

TABLE T71.
IMPACT OF IMPORT DUTIES ON U.S. TRADE, 1929-1935.

		In Million Dollars.						
		1929	1930	1931	1932	1933	1934	1935
A	Merchandise imported :							
1	Free of duty ...	2,843	2,051	1,381	879	878	991	1,206
2	Dutiable ...	1,556	1,010	709	444	571	645	835
A1	In per cent. of total imports of merchandise ...	65	67	66	67	61	61	59
A2	Do. ...	35	33	34	34	39	39	41
B	Customs revenue of U.S. Government	602	587	378	328	251	313	343
B1	B in per cent. of dutiable imports	38	58	53	76	44	49	41
B2	Do. of all imports	14	19	18	25	17	19	17
B1	1929 = 100 ...		153	139	200	116	129	108
B2	Do. ...		136	129	179	122	136	122

The figures of this table include fiscal as well as protective duties. But all the same the figures are simply exorbitant. With the coming of Mr. F. D. Roosevelt came a pleasant tentative change of policy, but after the first wave the development stopped and at the moment there does not seem to be the slightest hope of further improvement.

The response of the other countries to the lowering of the tariffs in the U.S. in 1933 was more than poor. But this is neither a question in which polite acknowledgment of the other party's politeness may be expected, nor one in which the other countries can, as easily as the U.S., go forward on this way. To turn this into a question of whether the weak ones follow the strong leading man sufficiently quickly would mean killing all hope of an early improvement.

(b) In a number of cases some countries simply cannot lower their protection of some industries as long as they are not able immediately to offer to the masses of unemployed and of ruined business people new fields of activity. The chief case in point is that of agriculture in Europe, though a number of overseas manufacturing industries are in the same plight, *e.g.*, the textile and iron industries of India. Here the choice lies between three possibilities : (1) mass emigration ; (2) quick creation of new large industries with a ready-made market ; (3) continuance with the system of protection, hoping for the best from the equalizing effects of the further growth of the world population.

The first of these three possibilities must be discarded for many reasons : there are no countries able to receive quickly really large masses of immigrants. Any country which might try its hand at such a game would thoroughly and speedily be thrown out of gear ; and the experience of the mass transplantation of Greek people from Asia Minor into Greece was certainly not encouraging. The expense would be enormous and certainly not much less than the cost of establishing new industries, as our second possibility involves. But money enough is scarcely available in the really urgent cases, and even were it squeezed out of the taxpayer or forced as a rather violent loan from the recalcitrant capital market there would be no market for the additional industrial produce created in this way.

(c) The only remaining possibility for countries in this position is to continue their protective policy, though on no account to increase it. At the same time, nowhere in the world should a government encourage the development of new industries by help of any kind, be it ever so well veiled or indirect. If a kind of truce in these things could be reached by all those countries which are not strong enough to lower their protectionist walls for the time being, there would be a certain hope that the increase in world population might allow the present day surplus of industrial and agricultural productive power gradually to be absorbed.

This fact that the population of the world is growing all the time is often overlooked, because the white nations, for obvious reasons, are more hypnotized by their own population movements. Nearly all of these show quickly-decreasing frequencies

of births, most of them, as Mr. Robert Kuczynski has shown,⁵ have reached a stage where, other things remaining equal, their population is bound to decrease in the near future at no negligible rate. But this is not the state of affairs in the rest of the world. Even allowing for all the uncertainties in our knowledge of population movements in a number of countries it is quite certain that a rough estimate of 1 per cent. as the annual rate of increase of world population is more probably an under- rather than an overestimate. This means an annual increase of more than 20 million new consumers. If we assume that the raising of consumption in India, the French and Dutch Indies, Brazil, China, Central Africa and some other countries to present-day levels in Europe and the U.S. will take no more than thirty years, then a further growth at the rate of $1\frac{1}{2}$ per cent. in the world's consumption of goods produced by modern industrial and agricultural methods may safely be expected, on the average, for the years to come. This annual expansion of the world market for modern products is really important. At present it refers to the industries of at most half the human population of the world. A rate of increase of $2\frac{1}{2}$ per cent. in world population is a rate of increase of 5 per cent. in relation to this half. Such a rate should remedy the existing cases of over-production within a period of five or six years—if the truce should hold good over that period.

This is no panacea ; it cannot heal all the wounds of the last twoscore years of unreasonableness. Alone it cannot help at all, because alone it cannot be worked at all. There must be reached, at the same time, other international agreements of a general character, and some other changes must take place in the mentality and behaviour of certain powers. Of these we shall speak presently. But taken together with these agreements and changes in mentality it is not blind optimism to hope that the mere growth of mankind will help the world's consumption to overtake its production.

Part of this policy would be a series of credit operations and a temporary international stabilization of the production of certain raw materials and foodstuffs. The chief problems are two :

- (1) Our technique of storing raw materials and foodstuffs,

⁵ See R. R. Kuczynski, *Population Movements*, *passim*.

with the exception of the most perishable among the latter, is now so advanced that in times of surplus it is quite possible to lay in stocks which may be drawn on in times of shortage. The world is now consuming certain metals for armament purposes as quickly as possible, and a serious shortage of some of them may come within a relatively short time. The same is true of certain foodstuffs, the prices of which have risen very quickly since the middle of 1936. The present moment is, therefore, one at which intervention for the purpose of absorbing stocks which press on prices, and thereby prevent recovery, might be necessary only in a few cases. But if once the principle of international action had been established in a few "minor" cases it would quickly become a standing feature, so that the next glut of wheat or cotton would find it in working order and the apparatus necessary for financing such a procedure organized and supplied with the necessary means.

(2) An indispensable feature of this policy would be that it should be the policy of governments, and that all governments should accede to it and in their legislation and administration implement it to the full. As it can hardly be expected that, from the first moment and in every case, all countries will take part, international agreements concerning the more important raw materials should be concluded from time to time by the governments chiefly interested. The crucial question is, of course, whether those governments which do not represent actual, but only possible producers, would take part in such arrangements. Mild pressure might help a lot, and a cautious price policy on the part of the monopolistic organizations created in this way, clothed in the robes of international governmental help and supervision, would go a long way to prevent a Cadmus seed of outsiders arising. The organizations should give a wide measure of influence to the consumers in the shape of the governments representing them, when the fixing of prices or of quotas of production or similar things turned up. It should not be necessary for every international organization of this kind to make its own Stevensonian blunders. But then nothing is such good propaganda as success. When some industries, some branches of agriculture, some countries have experienced in one way or another the blessings of "artificial" stabilization of production and prices, others will become

friendly towards the idea in their particular fields of interest ; and when some countries have shown an improvement of their economic situation under such a system, one after the other will try to take part in the scheme, after the total deadlock reached under the at present prevalent method of protection of everything and retaliation at any price. Drive in the thin edge of the wedge ; and others will only be too willing to drive in the rest of it.

All this would, of course, be possible only in an atmosphere of mutual confidence and of peaceful co-operation. Against a desire for territorial gains, and attempts to subject other nations to blackmailing tactics, the most reasonable policy cannot thrive. But this leads us to the next subject of our inquiry, viz., the emergency situations caused by wars and periods of feverish all-round preparation for war.

6.—*The Present Boom.*

It seems, some people might think, ridiculous to think of stabilizing the production of raw materials in a period of renewed activity, marked by a rapid increase in the numbers of people employed. Accumulated stocks, remainders from former periods of glut, are being speedily consumed, prices are rising with great speed, and in some cases even begin to soar sky-high. But such a period is just the right time to think of the future and to provide for it. Is there anybody who can see how the development of 1937 apes the development of 1925 with feelings other than the deepest misgiving ? After the period of consumption of stocks and of rising prices we shall see as the next stage, just as twelve years ago, a mad rush for the extension of the means of production. Is this to be the only outcome of our bitter experience ? We should not overlook how much of the present boom is due merely to the crazy armaments race into which mankind has recently plunged. This is bound to overdevelop certain industries and parts of the world and to leave others lagging behind. Now armaments have, among other qualities, a very nasty one. There comes a time when armament requirements are satisfied, when either the stocks of war materials must be " consumed " or the industries producing them must reduce their activities to the small scale of renewing those implements and ammunition which either

become technically obsolescent (*e.g.*, aeroplanes) or unsafe to hold in stock any longer (explosives). The choice is then between war and unemployment. This is a terrible choice, and one must do in time all that is possible to prevent it from arising. I quite understand that at the moment rearmament cannot be stopped. It is sad, but it is true. But there is all the more reason why statesmen should see to it that at this fateful time their nations should have a third alternative. It is easy to ask people to make sacrifices, even of wealth and of profits, when business booms, when they are wallowing in riches. The time to provide for lean years is in the fat years. Nations which forget this in the frenzy of their orgy of brisk business will suffer for it.

Sceptics may doubt whether the economist has any chance of being heard when he raises the voice of reason during such a time ; but the duty of the economist is quite clearly to speak in time. He would not be a real asset to mankind were he to hold his tongue when his word might possibly be heard. To be wise after the catastrophe is a sad pleasure and cannot revive a corpse.

B.—RAW MATERIALS IN WAR-TIME

Two features are characteristic of the part which raw materials play in war-time and in the preparation for it : (1) compared with peace-time they are necessary in larger quantities and in different proportions ; (2) they serve, to a large extent, different technical purposes, that is, a substitution of uses takes place. The first makes the creation of stocks in peace-time the focus of interest, the second the development of new technical features which may serve armament purposes immediately, but which may create new technical foundations for peaceful production also. The history of industrial progress during the last century has been, to an important extent, the history of the development of substitutes ; and it is probable that the technical development of the years to come will consist to an even larger extent of progress in this field. Warfare and armaments, unpeaceful as they are meant to be and as their chief and immediate achievements in the fields of economics and technique are, have proved many a time, and will prove so in the future, strong levers of progress for non-military purposes.

I.—*War-time Production of Raw Materials.*

We have shown already that the quantitative achievements in the production of raw materials, foodstuffs and fodders of which a nation may boast in peace-time will not always hold good during war-time. The change-over from peace- to war-time production means quick new investment on a large scale, even if none of the existing industrial body is destroyed or put out of gear by inimical action. Munitions may have been produced in large quantities against a coming war, but once "consumption" begins it is up to production to maintain the supply. No general ever complained of a surfeit of shells. The size of the stocks determines the tactics of warfare, not the tactics the requirements in ammunition. The productivity of industrial labour and the numbers of the army become mutually limiting factors.

Most of the raw materials will be necessary just as they were for peaceful purposes, though the production of some of them will be more vital than of others, while the production of some goods which serve "only" civilian purposes will be pushed into the background. The number of these key materials, in the positive and in the negative sense, is, however, not very large. Some may, however, offer serious difficulties to those countries which have not developed satisfactory substitutes, do not produce them themselves in sufficient quantities and are not able to get them from abroad. War leaves behind it, even in victorious countries, industries in a sad state of depreciation and disproportion. But the aftermath of the next great war is scarcely an object for our scientific interest at the present moment.

There exists, however, a connection between some raw materials and the possibility of preventing war.

Many people have been sorely disappointed by the poor results of the activities of the League of Nations in aid of Ethiopia. I quite understand this feeling, and to a certain extent I share it. It was a shameful experience to see the whole of white humanity, with very few exceptions, wanting passionately to stop the war and to save the Ethiopian sovereignty from extinction but being unable to do it. The conquest of Ethiopia was an enterprise of deliberate brutality. It would have been a wonderful thing had the League of

Nations been able to save the Ethiopians. But the fact that the League's endeavours were not successful cannot destroy our hopes for the future.

This enterprise of the League was a first attempt in an entirely new field. It faced difficult problems which, in such a trial case, could have been solved only by quite extraordinary wisdom, energy and discipline. Which were the key points in regard to raw material supplies? An economic and diplomatic technique for mastering these problems had to be built up. The astonishing thing was not that these problems were not solved in time, but that some of them were solved, though too late, at all, and that the strong endeavours to stop this war became, gradually, surprisingly popular in many countries. After all, Mr. Mussolini had a close shave. His guesses came out right, but in spite of the unheard-of favour of the political, military and economic situation, with an astonishingly narrow margin. Now dejection and hopelessness prevail among the friends of the idea that war might and should be prevented by economic boycott, backed by military power. But such despondency is not justified by the facts of the case. The League of Nations will be powerless in the next case only if and when her friends give up or when her apparent friends double-cross her. Many people all the world over are prepared to follow a policy which deprives even their home industries of big chances of temporary profits and employment provided that such a sacrifice seems to offer a real chance of avoiding or shortening bloodshed or of protecting weakness in distress.

This is particularly true of the United States. It would be quite wrong to think that the idea of those who take an interest in politics is to save their own skins at any price. They know only too well that Europe, after a new great war, would be no good as a customer. They have already suffered from the experience that Europe does not pay her war debts to America and understand that the condition of Europe after a war may mean the breakdown of normal, peace-time employment of large numbers in the U.S. The form in which this knowledge expresses itself in terms of legislation resembles the groping movements of a blind man in an unknown place. But I think that any country which takes the possibility of war seriously into account will have to reckon on total passivity in the U.S.

The industry and agriculture of this country will not provide any country which is at war with anything it needs or wants on credit, and probably not even for cash, and the government and public opinion of that country will not allow any belligerent government to borrow there.

2.—*Transport of Raw Materials.*

On the whole a boycott by important countries like the U.S. against belligerent nations would bear impartially on whoever might be fighting, including "satisfied" as well as the "dissatisfied" nations. But one factor will work chiefly against countries like Germany, Italy and Japan: namely, the insecurity of transport to them from those parts of the world which might be willing to play the hateful rôle of black-legs in an international selling strike against countries at war. If we look at the results of our inquiries from this angle, we find that Russia hardly depends at all on transport which might be easily interrupted by enemy activities. France may count on the raw materials she can obtain from her colonial empire: not much, but certainly a help. The same is true of the British crown colonies, protectorates and mandated territories. It is not certain how far this applies to the raw materials Britain might buy from the Dominions and India. But as things stand now it is more than probable that at least Canada, Newfoundland, Australia and New Zealand would not take part in an international selling boycott against Great Britain, so long as the goods were paid for without loans raised in these Dominions themselves. The investments of Britishers in all these Dominions are still very large. Mr. J. H. Richardson estimates them for 1933 at £2,260 million, and those in the U.S.—including Central America—at only £220 million. To buy these back would probably be deemed sufficient payment by these Dominions. As to India it is, of course, not sure whether the foundations of British power are secure enough to keep that country out of such a boycott or from revolt. If they are, certainly British investments in India are large enough to pay for a large volume of raw materials and foodstuffs from India in time of war. (The British investments in India are included in Mr. Robinson's total.)

For France and England the question is only whether ocean

transport will continue to bring them the things they may buy overseas. I am not an expert in these matters, so I do not feel very competent to press my personal opinion about this ; but I think that it will be found true that even a pessimistic view of this question shows Britain and France to be in a much better position than Italy, Japan or Germany.

But whatever the opinion of the experts may be, it seems certain that to organize safe conduct over the sea for goods on the necessary enormous scale, and to provide the equally enormous quantity of tonnage will require a great deal of time. This is where the laying-in of stocks may prove decisive. It seems hardly possible to lay in stocks of a size sufficient for a long war : the investment would have to be enormous. It could not be done on such a large scale in secret. Really large purchases would be a sort of public announcement that a country expected war within a short time. Such a thing might be done openly by a country which nobody believed to want, or to be prepared for, a war. Countries which rightly or wrongly are suspected of being on the look-out for a good chance to begin a victorious war cannot undertake such a thing without giving their hand away. All they can do is to lay in some small or middle-sized stocks clandestinely. But even stocks of medium size will be of vital importance during the period of organizing mass transport and huge *convoys*. In this respect Great Britain and France are incomparably better off than the other big powers.

Germany, Italy, Japan, indeed, have all the odds against them in this matter as long as the other nations do not sleep or deliberately look the other way. Their purchasing power on the world market is not large, neither is their credit. Both are already overstrained owing to the purchases they have had to make for current rearmament on a large scale. Germany has already had seriously to hamper the nutrition of her population. A country which, according to the words of its leading politicians, has even in peace-time reached a stage where it has to choose between butter and bombs, will certainly not be able to count on sufficient food and material when the consumption of these things really begins on a war-time scale. Even were Germany able to buy abroad its international purchasing power would be small, as its foreign investments are not large. It

would scarcely be able to bring over its borders such goods as it might be able to buy in neutral countries. An occasional "commercial" submarine boat, not very large, might slip through, but this would hardly cause any remarkable alleviation of the scarcity, particularly of the two really crucial classes of materials which are bulky, viz., petrol (and coal, in the case of at least Italy) and foodstuffs. The country would have to manage with the stocks it had in hand when war broke out, plus what it might possibly capture (it would not a second time find the warehouses of a captured ocean port bulging with wool and cotton), plus what neighbouring neutrals would let them have. This would not be much, for the technique of preventing neutrals inside a blockade line providing blockaded powers with materials and food was worked out between 1914 and 1918, and a new war would find it applied without the hesitations which marked those years.

The situation of countries like Germany is so hopeless that one can only wonder why the policies of these states are not framed with reference to these realities. It is quite possible that the responsible politicians know all this quite well, but try to bluff, believing that their bluff will not be called. . . . But this leads us into the realm of politics and away from the subject-matter of this essay in applied economics.

3.—*Planning.*

War and preparation for war cannot, under modern conditions, be undertaken thoroughly without a large measure of planning. When Mr. J. M. Keynes was able, a few years ago, to say that the end of *laissez-faire* had come, the reason why he found so much agreement with this bald statement was partly that all governments had been taught the above truth by the bitter experience of the last war. The planned economic system which has grown up since the war has disappointed many an observer and critic in the rank and file of the economists. The blunders of uncontrolled bureaucracy have not been negligible, and every mistake made by a public authority has been subjected to the widest measure of publicity, often consisting of criticism and comment far beyond the limits of truth. So we have liberal outbursts of all kinds, and these are certainly not always the outcome only of wounded prejudice. All the same

it is certain that private initiative can scarcely hope to enable any modern industrial country to hold its own in a modern war even for one month. Already in peace-time armament is beginning to force planning on all nations which seriously want to prepare for their defence. Even liberals who oppose protectionism with convinced passion proclaim the necessity of hoarding in the United Kingdom at least one year's supply of wheat, dispersed in specially-built underground warehouses. The next step is clear. This wheat would have to be sold each year and replaced by fresh wheat, so that before anyone knew what was happening governments would find themselves ankle-deep in the wholesale wheat trade. The necessity for, and possibility of, large-scale governmental planning is becoming self-evident, even though economic theoreticians remain unconvinced. Gradually even more sophisticated observers are recognizing that the blunders made by an experienced bureaucracy are certainly not worse than those made in ordinary private business.

This is important for two reasons.

(a) Under such conditions the necessity for state planning and state direction of production, transport and consumption would present no serious difficulty to any government involved in a future war.

(b) If the maldistribution of raw materials is to be remedied in peace-time and for peaceful purposes, governments will have to plunge deeply into economic activities. A tentative dip will no longer do. They will be able to do this wholeheartedly and with fair prospect of success because they are accumulating such a stock of varied experience and building up an adequate technique for an apparatus applying it. War and armaments are in this respect not only the great taskmasters, but also the successful teachers of mankind. But in the pleasure of this discovery do not let us forget that they are nasty and dangerous teachers.

CHAPTER VII

RAW MATERIALS AND INTERNATIONAL PLANNING

NOT all nations are equally wealthy ; but not every miser is poor. A country cannot at one and the same time spend all its money on materials for armaments and on materials for civilian purposes. Apart from this we have seen that no problem of *access* to raw materials exists. The lack of international purchasing power from which some countries suffer is, in its bearing on the raw material situation, just as much a problem of selling up to the full production capacity of existing industries. In some cases rather successful compromises concerning price control, limitation of output and division of markets have been reached by private, though government-tolerated and sometimes government-helped, agreements among producers. There would not be much point in giving a descriptive catalogue of existing organizations of this sort ; the details frequently change and such a list would soon become partially obsolete. We will therefore hurry on to a discussion of those problems connected with a policy of deliberately developing these modest beginnings, attributable mostly to private initiative, energy and reasonableness, into a properly organized plan. What, then, are the conditions of successful international planning in the field of the distribution of raw materials, and how is it possible to imagine them being implemented in our actual world ?

A.—SCIENTIFIC PREREQUISITES OF INTERNATIONAL PLANNING

The first requisite is a knowledge of the facts with which we have to deal. We are not absolutely ignorant in this respect. The official and private statistics of many countries contain quite a lot of valuable information, which allows certain conclusions to be drawn with a good measure of certainty. We have made use of these sources ourselves, in so far as one

individual's knowledge of languages and time for calculations have allowed ; and the author of this book feels decidedly that he, at least, has learned a good deal about the subject, and that the additions to his knowledge concern points of real practical interest. He hopes that the reader may feel the same. But the studies we have made have shown, I hope, how many contradictions and other uncertainties the material still contains, how many gaps remain to be filled, and how much the lack of comparable data makes itself felt in a rather exasperating way. Quite a lot of the work to be done in order to further international planning would consist in forecasting. But this is quite impossible, as far as the future demand for raw materials is concerned, so long as we know little about the elasticity of the demand and supply curves of the different materials. The beginnings of such statistical work can be seen in many places ; we have used this work freely and found that it is valuable. The League of Nations already plays an important part here, and so also does what we might call the British League of Nations. But this is not enough ; inquiries of this sort will be really conclusive only when they are made at the instance of one international authority, when the statistical offices of all important countries adapt their methods of collecting and presenting their data to the requirements of international comparability, and when the control of the accuracy of these statistics is itself international, so that no suspicion can disparage the value of the data.

All this will be politically and technically difficult, and also expensive. It must be undertaken, however, in spite of all these difficulties ; but it is not necessary to wait for perfect achievement in this field before making endeavours in other directions.

B.—A CENTRAL ECONOMIC PLANNING AUTHORITY.

One of our proposals, made above, was that an international truce in the opening up of new, and the expansion of existing, industries with the help of governments should be introduced, so as to give the normal peace-time consuming power of mankind an opportunity to catch up with productive capacity. This disparity is at present a permanent source of local distress and of serious general disturbances of economic life. If this

proposal were adopted, one of the first problems to be handled would be that of trying to stabilize the business cycle so far as the production of raw materials is concerned, thereby increasing the feeling of security and diminishing the objective damage brought about by fluctuations in prosperity, which always tend to lead not only to desperate steps in wholesale protectionism but also to serious political troubles. Another object of such an organization would be the restoration of a reasonable distribution of international purchasing power. A start has already been made along these lines, *e.g.*, with the Free Trade régime in certain parts of central Africa.¹ It should be possible to encourage similar developments, to influence national protectionist policies and to make countries apply protective measures in such a way as to injure as little as possible the economic interests and susceptibilities of other nations. Another function of such an international planning centre would be to give advice to those nations wanting to establish plans for their internal economic development. The International Labour Office has certainly not fulfilled all the optimistic hopes which greeted it when it was established. Too many of the international agreements drafted by it have remained unratified by many important nations. But some progress has been made, and at least in the non-dictator countries the findings of the conferences and committees of the office have exercised some influence by morally educating authorities, scientists and public opinion. The eight-hour day has lost its bad name, thanks to the respectability with which it has been invested owing merely to the fact that the governments affiliated to the I.L.O. have taken it seriously, even in countries where public opinion is not favourable to such measures of "rank bolshevism".

¹ An example of the possibility of smoothing out ominous international conflicts of interests and jealousies by sitting round a table in time and with good will is provided by the International Congo Act. By this Act the so-called conventional Congo Basin was made an area of free trade where all nations were treated on an equal footing. The clauses of the Covenant of the League of Nations and of the several Mandates for Mandated Territories providing for the same treatment for all member states of the League are further proofs of the organizing power of good will. The fact, too, that discrimination against Japan and Germany was not reintroduced in these Territories when these states left the League and thereby lost their right to equal treatment in the Mandated areas is again a proof of the possibility of doing things reasonably in public life even at the cost of some sacrifice on the part of those who might easily play the role of dog-in-the-manger.

Another field of activity would be an impartial inquiry into the effects of protection and its alternatives in special cases. Such work as this also, and much more which might have been mentioned here,² has been undertaken already, or is about to be undertaken, either by the I.L.O. or by the League of Nations itself.³ But it has all been done without the necessary measure of co-ordination, in an unsystematic way, when particular problems came to the fore and generally only after some crisis had occurred. This business of planning must itself be planned.

The ultimate aim would be for the Central Authority to pursue a policy of promoting international agreements not only concerning certain raw materials, but also concerning the financing of sales and the redistribution of international purchasing power. On the strength of international advice and of confidence in international control, the credit resources of the world might again be used systematically instead of in the present piecemeal way.

C.—POLITICAL CONDITIONS

All this would mean a great deal of interference in the affairs of individual governments. It cannot be denied that sovereignty would be at a discount under a policy of this sort. This is a serious difficulty. A government which wants to take part in such work of reorganization must not only take part in the deliberations and debates, but must apply by its national legislative powers the resulting suggestions, recommendations and rules. The argument that one or the other measure would infringe on sovereignty would be totally incompatible with these ideas. All the activities of a really active political and economic world organization inevitably infringe on sovereignty. The activities recommended here will do so no more than those caused by the Washington Naval Agreement, the Washington Agreement on the Eight-Hours Day, and many another agreement. The mere existence of the League of Nations and of the International Labour Office is a permanent and strong challenge to the sacrosanctity of sovereignty.

² A splendid example of work of the kind is the inquiry of the International Labour Office on Forced Labour.

³ See the inquiry of the League of Nations mentioned in the Preface of this essay.

I shall not here go into the several purely political implications of such plans. They are obvious, and they lead far away from the field of an economic inquiry. But it is quite clear, to mention only a few examples, that the measure of armament which a country would be free to undertake could not fall outside the scope of such regulation. The powers wishing to bring order into the world would have to tolerate such regulation. And if certain nations refuse to take part and to implement the international decisions, those countries which are prepared to implement them must develop plans for acting on their own account and for leaving the others outside—literally in the cold. If, *e.g.*, metals necessary for armaments can be bought even for alleged or actual non-military purposes only by states which subscribe to such an international order ; if international loans are given only to nations which qualify in the same way ; and if foodstuffs are sold only to nations which fulfil these obligations : then it will not take very long to bring order out of chaos and to stop large-scale waste of the produce of precious human labour and thriftiness on internationally mischievous objects.

D.—PSYCHOLOGICAL CONDITIONS

There are grave difficulties in the way of such a development. The past policy of some régimes has been quite incompatible with such an objective. Such régimes will have to choose between either an adaptation of their ideology and propaganda to these new needs, or the consequences of being left out in the cold. The restitution by international action of purchasing power to those nations seriously short of it can be expected only if these nations give the necessary guarantee : not merely on paper, but in a way that is open to impartial international control. Against such a development many cheap and sophisticated philosophies will be mobilized as well as many instincts, valuable or nasty, as the case may be. As long as *sacro egoismo* is a respectable philosophy in national and international life ; as long as hymns are sung after a successful act of cheating, blackmail or violence against another nation, such a development is impossible.

The old battle between emotionality and rationality will have to be re-fought. As long as nations believe in adventures

whilst complaining that adventures may be dangerous, as long as they believe that domination is healthier, more productive of great ideas, and more virtuous than comradeship, all endeavours to smooth out economic difficulties by reasonable organization will be hopeless. Ultimately the problem is one of education in co-operation and obedience to the rules of an international administration ; education in international virtue. But this is a subject for a whole further book, and so we will break off here with the words of Mr. Hogben :

The greatest obstacle to lucid discourse in these matters is the psychological anti-vaccinationist who uses the word freedom to signify the natural right of men and women to be unhappy and unhealthy through scientific ignorance instead of being healthy and happy through the knowledge which science confers. Haunted by a perpetual fear of the dark, the last lesson which man learns in the difficult process of growing up is " ye shall know the truth, and the truth shall make you free. . . . Knowledge which hath a tendency to use is the only proper preparation of a race of young men and women provided against the next age."

APPENDIX

STATISTICAL TABLES

Most of the figures in these tables have been taken
 either from the German Statistical Abstract,
 or from the Statistical Year Book of the League of
 Nations,
 or from *The Mineral Industry of the British Empire and
 Foreign Countries*.

In some cases conversions of data given in various measures
 have been converted into one system of units by the author,
 and additions and computations of percentages added.

When figures from several sources have been combined into
 one table or when figures have been taken from other sources
 this is stated.

A.—METALS

I.—IRON.

(1) WORLD PRODUCTION.

In Million Metric Tons.													
	1913	1922	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
Iron ore ...	177	105	153	154	173	176	203	181	119	76	89	119	?
Pig iron ...	79	56	77	79	87	89	99	81	56	39	49	62	74
Raw steel	80	70	92	95	103	111	122	96	70	51	68	82	99

(2) LODES OF IRON ORE.

(Only countries where the lodes comprise more than 1,000 million metric tons.)
(a) According to a German Compilation of 1913¹.

Continents Countries.	In Million Metric Tons Certain Lodes.			Possible Further Lodes.
	Iron Ore.	Percentage of Metal	Content of Metallic Iron	
Europe	22,598	41	9,307	16,818
Asia	4,402	62	2,734	20,855
Africa	1,344	50	678	10,000
America	26,866	53	14,249	119,947
Oceania	2,602	54	1,403	43
TOTALS, WORLD ...	57,812	49	28,371	167,663
France	8,164	39	3,184	4,090
Germany	1,317	39	517	2,843
Great Britain	5,970	33	1,986	6,199
Sweden	2,203	63	1,387	674
Spain	1,216	51	571	273
U.S.S.R.	2,057	49	1,009	617 ²
India	3,326	65	2,170	20,500
Union of South Africa ...	1,095	50	544	2,000
Brazil	7,000	66	4,620	?
Cuba	3,159	41	1,308	12,000
Newfoundland	4,000	53	2,120	4,000
U.S.	10,452	47	4,949	83,728

¹ Following a compilation of the *Verein für die bergbaulichen Interessen* at Essen, 1913.

² Excluding new lodes found in the district of Kursk of between 15 and 40 thousand million metric tons of a content of iron between 30 and 50 per cent

(b) According to an American Estimate¹

Known Iron Ores.					In Million Metric Tons	In Per Cent of World Totals.
France					1,790	18
U.K.					317	3
Sweden					442	4
Germany... ..					255	3
Spain					353	4
U.S.S.R.					263	3
Total, Europe					3,735	30
U.S.					4,700	40
Brazil					3,000	24
Cuba					1,000	8
TOTALS, WORLD					10,000 and more	

¹ Quoted from *Lippincott*, who follows M. *Roesler*, Bulletin No 706, U S Geological Survey, 1921. *Roesler* mentions a possible further 424 thousand million tons reserves of iron ores

196 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(3) PRODUCTION OF IRON ORES BY COUNTRIES, 1913-1935.

	In Million Metric Tons.					
	1913.	1928.	1932.	1933.	1934.	1935.
Germany	36.9 ¹	6.3	1.3	2.6	4.3	6
Luxemburg	7.3	7	3.2	3.4	3.8	4.1
Austria	3.1	1.9	.3	.3	.5	.8
Hungary	2.1 ¹	.2	.1	.1	.1	.2
Czechoslovakia	—	1.8	.6	.4	.5	
Great Britain	16.2	11.4	7.4	7.6	10.8	11.1
France	21.9 ¹	49.2	27.6	30.2	32	32.3
Spain	9.9	5.8	1.8	1.8	2.1	2.6
Italy	.6	.6	.4	.5	.5	.6
Sweden	7.5	4.7	3.3	2.7	5.3	7.9
U.S.S.R.	9.2	6	12.2	14.5	21.7	27.1
U.S.	63	63.2	10	17.8	25	31
Newfoundland	1.5	1.5	.3	.3	.5	.7
Cuba	1.6	.4	.1	.2	.2	
Chile	.01	1.5	.2	.6	1	.8
India	.4	2.1	1.8	1.2	1.9	
China	1	2	2.3	2.1		
Algeria	1.3	2	.5	.8	1.3	1.7
Spanish Morocco	—	1	.2	.4	.8	1

¹ Pre war area. Only those countries have been included (with the exception of Italy) where at least one figure was bigger than 1.0.

(4) PRODUCTION OF PIG IRON AND RAW STEEL, BY COUNTRIES.

	In Million Metric Tons							
	Pig Iron.				Raw Steel			
	1913.	1929.	1934.	1935.	1929	1934.	1935.	1913.
Germany, (incl. Saar)	20.7 ¹	15.3	10.6	13.1	20.8	18.3	13.7	16.4
Luxemburg	2.5	2.9	2	1.9	1.3	2.7	1.9	1.8
U.K.	10.4	7.7	6.1	6.5	9	10.1	9	10.2
France	5.2	10.4	6.2	5.8	5.1	9.8	6.2	6.3
Belgium	2.5	4	2.9	3.1	2.6	4.1	2.9	3
Spain	.4	.8	.4	.4	.2	1	.6	.6
Italy	.4	.7	.6	.7	1	2.3	1.9	2.3
U.S.S.R.	4.6 ¹	4.3	10.5	12.5	.5 ¹	5	9.5	12.4
Poland	—	.7	.4	.4	—	1.4	.9	.9
Czechoslovakia	—	1.6	.6	.8	—	2.2	.9	1.2
U.S.	31.5	45.3	16.4	21.7	31.8	57.3	26.4	34.6
Canada	1	1.2	.4	.7	1.1	1.4	.8	1
India	.2	1.4	1.4	?	.06	.6	.8	.9
Japan (incl. Korea and Manchuria)	.2	1.5	2.4	2.7	.2	2.3	3.7	4.4

¹ See note ¹ at the foot of Table (3).

(5) IRON IN INTERNATIONAL COMMERCE; EXPORTS OF ALL COUNTRIES.

	In 1,000 Metric Tons.				
	1929.	1930	1931.	1932.	1933.
Iron ores, including pyrites	50,149	44,306	29,268	20,535	24,631
Scrap iron, scrap steel ...	2,978	2,179	1,743	1,633	2,716
Pig iron and semi-finished goods of iron ...	5,010	4,259	3,618	2,436	2,894
Tubes and pipes ...	1,761	1,280	930	675	872
Iron in bars ...	6,070	5,101	4,629	3,496	3,444
Iron wire ...	1,389	1,063	1,059	777	835
Tinplate ...	908	801	600	629	751
Other sheet iron ...	4,052	3,192	2,503	2,018	1,921
Rails for railways and tramways ...	1,352	1,137	889	399	546

(6) INTERNATIONAL TRADE IN IRON ORE AND PIG IRON.

	In Million Metric Tons											
	Iron Ores.						Pig Iron.					
	1929.		1932.		1934.		1929.		1932.		1934.	
	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.
Germany ...	17	·1	3·5	·02	8·3	·08	·2	·4	·06	·07	·09	·2
Belgium and Luxembourg ...	14·1	·8	9·5	·4	10·3	·7	·7	·1	·2	·04	·2	·04
France ...	1·1	16·4	·3	10·1	·9	12·6	·04	·6	·07	·2	·07	·2
U.K. ...	5·8		1·8		4·4		·1	·5	·1	·1	·1	·1
Czechoslovakia ...	1·6	·4	·2	·08	·3	·09	·06					
U.S.S.R. ...		·5		·3		·3						
Sweden ...		10·9		2·2		6·9	·09	·07	·04	·03	·08	·07
Spain ...		5·6		1·3		1·8						
Japan ...	2·3		1·6		2·3		·8		·7		·8	
Algeria ...		2·1		·5		1·4						
Spanish Morocco ...		1		·2		·8						
Chile ...		1·8		·2		1						
Newfoundland ...		1·4		·5		·4						
Canada ...	2·5		·8		1		·04					
U.S. ...	3·2	1·3	·6	·09	1·5	·6	·2	·05	·1		·1	
British Malaya ...		·8		·7		1·1						

Only countries are mentioned where at least one item runs up to at least 1·0 in this table.

(7) PRICES.

In R.M. per ton

Annual Averages											Monthly Average
	1915	1928	1929	1930	1931	1932	1933	1934	1935	July, 1936	
<i>Iron Ore:</i> U.S., old range Bessemer, Lake Superior ...	?	18.80	19.59	19.84	19.84	19.84	15.63	11.83	11.77	11.76	
<i>Pig Iron:</i> U.K., Middlesborough Cleveland III ...	59.49	66.15	70.76	67.31	54.79	42.36	42.60	41.39	40.80	46.12	
<i>Iron Bars:</i> Belgium, barres, f.o.b. Ant- werp ...	103.04	114.54	115.81	97.20	69.37	49.26	57.05	63.89	64.09	64.09	
<i>Girders:</i> Belgium, poutre normal, f.o.b. Antwerp ...	114.10	97.43	101.87	92.64	64.34	44.23	51.77	60.62	61.83	61.83	
<i>Sheet Iron:</i> U.K., Middlesborough, ship plates, exp. f.o.b. ...	?	153.74	153.36	155.82	145.17	112.23	106.06	96.25	93.17	96.09	
<i>Tinplate:</i> U.K., Cardiff, f.o.b. ...	?	379.91	386.37	372.61	281.68	234.77	237.91	224.55	234.14	241.65	
<i>Scrap Iron:</i> U.K., heavy steel, N. Engl.	55.12	56.09	64.57	52.98	38.40	26.24	29.25	31.33	31.48	35.36	

(8) GERMAN CONSUMPTION OF PIG IRON.

	1913.	1917	1925.	1929.	1932.	1934
Pig iron consumed in million tons	18.6	13.7	10	13.2	3.9	8.7
Population in million ...	67			63.1		

1913 to 1929 : decrease of population 3.9 million or 6 per cent. ; decrease of consumption in pig iron 5.4 million or 29 per cent.

(9) PRODUCTION IN THE U.S.S.R.

	In Million Metric Tons							
	1913.	1929.	1930	1931	1932.	1933	1934.	1935.
Pig iron	4.2	4.3	5	4.9	6.2	7.1	10.4	12.5
Raw steel	4.4	5	5.9	5.6	5.9	6.9	9.6	12.4
Rolling-mill produce ...	3.5	3.9	5	4.4	4.3	4.9	6.7	8.2

(10) DEVELOPMENT OF HEAVY INDUSTRIES IN WESTERN EUROPE.

(a) *Production of Coal and Coke.*

	In Million Metric Tons.				
	1913	1930.	1929	1932.	1934.
<i>Coal :—</i>					
Germany ^{1 3}	141	108	163	105	125
Saar territory	—	9	14	10	11
Belgium	23	22	27	21	26
France	40	24	54	46	48
Great Britain	292 ⁴	233 ⁴	262	212	225
Netherlands	2	4	12	13	12
<i>Coke :—</i>					
Germany ³	32	25	39	20	21 ³
Saar Territory	2	1	2	2	2
Belgium	4	2	6	4	4
Netherlands	?	?	2	3	3 ³

200 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(b) *Production of Iron Ore, Pig Iron and Raw Steel.*

	In 1,000 Metric Tons.				
	1913.	1920.	1929.	1932.	1934.
<i>Iron Ore :—</i>					
Germany ⁷ ...	2,353	1,919	2,080	443	137 ⁵
France ...	21,918	13,921	50,731	27,599	32,000
U.K. ...	16,248	12,881	14,014	7,446	10,757
Luxemburg ...	7,333	3,704	7,571	3,231	3,834
<i>Pig Iron :—</i>					
Germany ...	10,900	6,000	13,400	3,900	8,700
Saar Territory	1,371	644	2,105	1,349	1,826
Belgium ...	2,485	1,116	4,040	2,749	2,907
France ...	5,207	3,344	10,362	5,537	6,155
U.K. ...	10,425	8,174	7,711	3,631	6,074
Luxemburg ...	2,548	693	2,906	1,960	1,955
Netherlands ...	—	—	260	233	258 ²
<i>Raw Steel :—</i>					
Germany ...	11,800	?	16,000	5,600	11,900
Saar Territory	2,080	740	2,209	1,463	1,950
Belgium ⁴ ...	2,467	1,253	4,011	2,758	2,898
France ...	4,687	2,706	9,717	5,640	6,174
U.K. ...	7,787	9,213	9,791	5,346	9,002
Luxemburg ...	1,335	570	2,702	1,956	1,932

¹ Bituminous coal and anthracite, excluding brown coal. ² 1933 ³ Excluding Saar Territory.

⁴ Including Irish Free State. ⁵ Probably a misprint in the (German) source. ⁶ Excluding ingots.

⁷ Metal content of iron ores mined.

GENERAL NOTE TO THE STATISTICAL TABLES ON IRON.

The above figures are taken chiefly from the German Statistical Abstract.

The Statistics of the League of Nations differ from the German figures in some cases seriously. To give a few examples :

				1913. Production of					
				Iron Ores		Pig Iron.		Raw Steel.	
				G	LN	G	LN	G	LN
				in Millions of Metric Tons					
Germany	...	...	...	36.9	28.6	20.7	16.6	20.8	17.6

The differences concern mostly figures for Germany.

2.—ALUMINIUM.

(1) PRODUCTION OF BAUXITE.

	1913.	In 1,000 Metric Tons.			
		1929.	1932.	1934.	1935.
France	309	666	401	528	513
Italy	7	193	87	131	170
Yugoslavia	—	103	67	84	190
Hungary	?	389	112	120	211
U.S.	214	372	98	160	238
British Guiana	?	220	85	66	?
Dutch Guiana	?	215	127	101	110
World		1,951	1,026	1,270	?

The peak years of production were in Hungary and the U.S. in 1928, in Dutch Guiana in 1930.

(2) PRODUCTION OF ALUMINIUM METAL.

	1913. ¹	In 1,000 Metric Tons.			
		1929	1932	1934	1935
Germany	1	33	19	37	71
U.K. ⁵	10	8	10	11 ⁴	15.1
Norway	2	29	18	16	16
Switzerland	10	21	9	8	11.7
France	14	29	15	16	21.8
Italy	1	7	13	13	14
U.S. ²	21	146	69	76	?
Canada	6	39	18	16	20.6
World ³	65	277	154	170	259.2

¹ League of Nations figures for 1913: *Germany*, .8; *U.K.*, 7.6; *Norway*, 1.5; *Switzerland*, 9.2; *France*, 14.5; *Italy*, .9; *U.S.*, 20.9; *Canada*, 5.9; World totals, 63.3. The countries the names of which are not given in *italics* show serious differences.

² Including "secondary production" ³ Excluding "secondary production" of the U.S. ⁴ 1933.

⁵ The *Statistische Zusammenstellungen der Metallgesellschaft A.G., Frankfurt a. M.* give the following series: 1913, 7.6; 1929, 13.9; 1932, 10.2; 1934, 12.9.

(3) INTERNATIONAL COMMERCE IN ALUMINIUM (EXPORTS ONLY).

	1929.	1930.	In 1,000 Metric Tons.				
			1931.	1932.	1933.	1934.	1935.
Bauxite	545	510	383	379	380	533	766
Aluminium	101	75	67	40	57	61	62

(4) PRICES.

	In RM. per Kg.							
	1913.	1929.	Annual Averages.					July
			1930.	1931	1932.	1933.	1934.	1935.
Germany, "Hütten," 98-99 per cent. ...	170	190	185.71	170	160	160	157.33	144
U.S., New York ...	?	222.23	218.06	212.04	212.04	171.04	119.82	113.61
								109.72

2a.—BARIUM MINERALS.

PRODUCTION.

	In 1,000 Long Tons.					
	1928	1929.	1930.	1933	1934.	1935.
Germany ...	254.1	281.6	232	145.4	349.2	341.8
U.S. ...	240.7	247.6	209.8	130.7	159.3	194.7
U.K. ...	49.9	57.1	58.7	66.6	74	18.1
Italy ...	26.7	25.5	19	23.1	31.9	40.5
France ...	29.6	—	—	13.5	18.1	—
Korea ...	—	—	—	4.9	5.8	10.9

A figure for world production is not available. The various barium minerals in this table contain very different percentages of the metal.

3.—CHROMIUM.

PRODUCTION OF CHROME ORE.

				In 1,000 Long Tons.				
				1928.	1929.	1930.	1933.	1934.
Southern Rhodesia	...	195.9	261.7	202.4	34.5	71	104.2	
Union of S. Africa	...	31.2	63	13.5	33.5	60.4	89	
India	...	45.5	49.6	50.7	15.5	21.6	39.1	
Japan	...	9.7	9	11.2	19.7	26.8	?	
Greece	...	20.6	23.8	16.8	14.6	30.2	31.5	
Yugoslavia	...	16.4	42.3	50.6	25.1	46.6	59.5	
Russia	...	40.7	28.1	65.1	110.9	127.2	?	
Cuba	...	28.7	39.8	35.9 ²	21.8	57.3	47.7	
Turkey	...	11.7	9.9	27.7	74.2	118	148.1	
New Caledonia	...	50	49.9	52.7	49.1	54.3	54.4	
World	...	440	580	530	403	618	?	

¹ Incomplete ² Only exports to the U.S

4.—COPPER.

(1) PRODUCTION OF COPPER ORES.

	In 1,000 Tons of Content of Metallic Copper				
	1913.	1929	1932.	1934.	1935.
Germany	26.8	29.1	30.9	26.1	28.3
Yugoslavia	?	20.7	30.2	44.4	39
Norway	10.6	19.1	16.7	22	20.5
Spain	44.9	63.7	35	33	30
U.S.S.R. in Europe ...	33.7	25	30	40	55
India	?	7.6	11.4	11.8	11.3
Formosa	?	6.1	3.5	4.5 ¹	?
Northern Rhodesia ...	—	5.6	88.6	140	?
Union of S. Africa ...	—	9	9.4	7.9	10.7
South-West Africa ...	?	12.6	2.4	—	—
Canada	34.9	112.5	112.3	166.5	189.9
U.S.	555.4	905	216	217.1	335.2
Mexico	52.6	86.0	35.2	44.3	39.4
Cuba	3.4	15	5.9	6.2	—
Chile	42.3	320.6	103.2	256.7	267.5
Peru	27.8	54.4	115	27.6	29.6
Australia	52.1	13	14.9	12.2	17.5
WORLD TOTALS	990.4	1,947.6	900.8	1,287.3	1,491.7

¹ 1933.

(2) PRODUCTION OF COPPER.

Countries.	In 1,000 Metric Tons.				
	1913.	1929.	1932.	1934.	1935.
Germany	49.5	93.4	129	104.8	116
Belgium	1.3	68.2	86.2	151.6	?
Great Britain	52.2	22.4	13.2	11.5	15.5
France	12	1.4	1	1.3	1
Spain	31.3	53.4	33.1	27	?
U.S.S.R.	29	33.5	46.6	53.6	63
Yugoslavia	6.4 ¹	20.7	30.5	44.4	39
Japan	66.5	75.5	71.9	67.8	69.8
U.S.	732.6 ²	1,242.9	308.9 ³	407.1 ³	537.5 ³
Canada	13.9	72.9	95.7	151.9	140.1
Mexico	43.7	66.2	35.1	44.3	41.2
Chile	20.2	303.2	97.5	256.9	270.7
Northern Rhodesia ...	—	5.6	69	140.1	148.2
Belgian Congo	7.5	137	54.1	110.1	108
Commonwealth of Australia	43.8	11	13.5	8.1	16
WORLD TOTALS	1,018.5	1,894.7	929.1	1,273.2	1,497.5

¹ Serbia. ² Excluding "secondary copper." ³ Refined copper only.

204 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(3) INTERNATIONAL COMMERCE.

	1929.	1930.	In 1,000 Metric Tons.				
			1931.	1932.	1933.	1934.	1935.
Total exports of copper ore	1,447	1,209	866	615	399	474	
Total exports of copper ...	1,284	1,136	976	755	870	1,158	1,329
Goods of copper exported, value, mill. RM. ...	815	718	475	289	260	265	265

(4) INTERNATIONAL TRADE IN RAW COPPER.

	In 1,000 Metric Tons			
	Imports.		Exports.	
	1932.	1934.	1932.	1934.
Germany ...	131	180	45	12
Belgium and Luxemburg ...	39	74	60	61
France ...	93	94		
U.K. ...	146	255		
Italy ...	53	63		
U.S.S.R. ...	12	11		
U.S. ...	149	175	101	238
Yugoslavia ...			26	36
Belgian Congo ...			60	44
Northern Rhodesia ...			74	132
Canada ...			92	97
Chile ...			121	239
Mexico ...			21	?
Peru ...			23	26

¹ 1931 : 43.

(5) STOCKS AND PRICES OF COPPER.

	Annual Averages.											Monthly Average July, 1936.
	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	
Stocks : 1,000 metric tons ...	374	368	351	278	382	530	597	704	692	590	568	548 ¹
Prices : RM. per 100 Kg.—												
Great Britain, London :												
Electrol	147.20 ¹	132.13	125.31	139.56	172.20	126.12	81.02	53.22	50.71	41.70	42.91	50.94
Standard	137.45		112.02	128.15	152.10	110.12	71.99	46.06	44.58	37.66	38.34	45.82

¹ December, 1935. ² 1913.

5.—GOLD AND SILVER.

(1) WORLD PRODUCTION AND PRICE OF GOLD AND SILVER.

	1928.	1929.	1930	1931.	1932.	1933.	1934.	1935
Gold	603	609	648	695	751	818	860 ²	946 ²
Silver	8,022	8,117	7,735	6,094	5,129	5,007	5,772	6,230
Price of silver, RM. per Kg.	79·12	72·38	52·28	40·22	37·99	36·57	38·79	47·40 ¹
Units of silver equi- valent to one unit of gold	35·19	38·45	53·25	69·22	73·28	76·13	71·77	

¹ July, 1936: 32·76. ² Excluding China

(2) PRODUCTION OF GOLD, BY COUNTRIES, 1929-1935.

	In Kg.			
	1929	1933	1934.	1935.
Yugoslavia	575	2,194	2,305	2,445
France	1,795	2,930	3,157	?
Rumania	2,213	3,732	3,468	3,509
U.S.S.R.	33,760	114,600	132,600	175,000
Sweden	900	8,978	7,673	5,600
Europe	40,000	136,500	149,700	191,300
Belgian Congo	5,377	9,794	11,672	13,000
Rhodesia	17,465	20,004	21,563	22,600
Tanganyika	282	1,230	1,325	1,550
Union of South Africa	323,860	342,565	325,960	335,109
Gold Coast	6,465	9,551	10,140	11,050
Africa	354,000	380,000	378,800	393,000
Canada	59,977	91,736	92,443	102,351
U.S.	64,042	71,653	86,430	98,484
Mexico	20,274	19,836	20,572	21,223
Central America	1,655	2,708	4,043	4,666
Brazil	3,415	3,919	3,449	3,706
Chile	1,028	4,526	7,392	8,562
Colombia	4,268	9,277	10,704	10,233
Ecuador	2,094	1,887	2,066	2,177
French Guiana	1,522	1,493	1,476	1,555
Peru	3,734	3,010	3,075	3,421
Venezuela	1,446	2,977	3,392	3,577
America	163,848	215,421	237,878	261,614
China	2,700	4,666	?	?
Japan and Dependencies	16,437	26,814	28,618	?
India	11,318	10,454	10,018	10,100
Dutch Indies	3,412	2,452	2,232	2,120
Philippines	4,996	9,215	10,585	13,400
Asia	39,700	51,000	54,100 ¹	59,000 ¹
Australia	13,286	25,824	27,577	28,530
New Zealand	3,500	5,136	7,065	8,290
Papua	1,420	4,098	4,984	?
Oceania	18,206	35,058	39,420	41,200
World	615,754	817,979	859,898 ¹	946,114 ¹

¹ Without the production of China.

(3) PRODUCTION OF SILVER, BY COUNTRIES, 1929-1935.

	In 1,000 Kg.			
	1929.	1933.	1934.	1935.
Germany	171	197	185	195
Yugoslavia	11	54	60	57
Europe	392	494	443	
Canada	720	472	511	517
U.S.	1,830	719	1,020	1,485
Mexico	3,380	2,118	2,306	2,351
Central America	93	149	109	93
Bolivia	193	170	162	192
Peru	660	228	323	490
America	7,026	3,911	4,506	5,211
Africa	11	124	146	161
India	227	189	181	181
Japan and Dependencies ..	163	205	249	254 ¹
Asia	459	433	464	500
Commonwealth of Australia ..	313	336	353	386
Oceania	326	350	365	400
World	8,274	5,312	5,924	?

¹ Incomplete.

(4) SILVER : STOCKS.

Figures for India and Shanghai [stocks in warehouses and afloat], U.S. and Canada [stocks held by producers], in 1,000 Kg.

Annual Averages.										Monthly Average.
1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	March, 1935.
12,016	13,909	15,602	15,064	17,047	19,217	20,166	20,406	23,024	22,898	17,867

(5) STOCKS OF GOLD IN THE WORLD.

Visible stocks of banks and estimated gold in monetary circulation.^{1,2}

In million Kg.										
1913.	1926.	1927.	1928.	1929	1930.	1931.	1932.	1933	1934.	1935.
15	16.2	16.5	17	17.4	17.1	17.7	18.7	18.4	19.7	20.1

¹ From 1930, excluding gold in circulation² Converted from tables in *Statistisches Jahrbuch fuer das Deutsche Reich*, 1928-1935, at the rate of RM. 1,392=500 gr. of gold.

(6) PRODUCTION OF GOLD DURING THE POST-WAR PERIOD.

In 1,000 Kg.								
	1913.	1920	1921	1922.	1923.	1924.	1925.	
Europe ...	...	47	2	3	7	10	21	31
Asia ...	...	44	35	34	36	36	35	33
Africa ...	...	312	288	281	249	316	330	329
America ...	...	287	148	151	160	164	174	178
Australia ...	...	80	34	28	28	28	25	22
WORLD...	...	768	507	497	481	553	586	593

6.—LEAD.

(1) PRODUCTION OF LEAD ORES IN THE WORLD BY COUNTRIES.

Lead Content of Ores Mined ; in 1,000 metric tons.

(a) in the World.

1913.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.
1,229	1,435	1,565	1,639	1,599	1,684	1,598	1,337	1,186	1,145	1,287	1,341

(b) by Countries.

	1929.	1932.	1934.	1935
Germany ...	52.5	45.3	52.9	54.2
U.K. ...	18.9	33.4	54.7	39.8
Yugoslavia ...	14.7	49.5	70.2	
Spain ...	116.5	100	63.1	66
India ...	103.7	80.1	90.2	90.8
Canada ...	148.1	116.1	157.1	153.8
U.S. ...	587.9	265.6	260.1	300
Mexico ...	248.4	137.2	166.3	184.2
Australia ...	197.1	213.9	233.5	225.4

208 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(2) PRODUCTION OF LEAD.

					In 1,000 Metric Tons.			
					1929.	1932.	1934.	1935.
Germany	...	...	...	...	124	106	124	136
Belgium	...	...	...	...	83	64	75	60
Spain	...	...	...	...	143	105	73	68
U.S. ¹	...	...	...	...	1,008	561	487	294 ²
Canada	...	...	...	...	148	115	143	149
Mexico	...	...	...	...	231	137	166	180
Burma	...	...	...	...	82	72	73	73
Australia	...	...	...	...	180	189	199	278
U.S.S.R.	...	...	...	...	6	19	27	45
WORLD	...	...	...	...	1,742	1,152	1,323	1,368

¹ Including, ²excluding, "secondary production."

(3) LEAD IN INTERNATIONAL COMMERCE.

	1929	1930.	In 1,000 Metric Tons.				
			1931.	1932.	1933.	1934.	1935.
Total exports	825	291	290	601	658	730	777

(4) STOCKS AND PRICES.

	1913.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.
Stocks, in 1,000 tons					65 ^a	136 ^a	240	279	304	302	294 ¹
Price, RM. per 100 Kg. ; Gt. Britain, London, raw, standard ...	40.06	51.49	45.09	49.44	36.33	24.24	17.21	15.94	13.47	17.11	19.50 ^a

¹ June. ^a Only U.K. and U.S. ^b July.

(5) SCRAP LEAD PRODUCTION IN GERMANY.

					In 1,000 Long Tons.				
					1928.	1929.	1933.	1934.	1935.
Production of primary lead	...				85.6	96.4	114.8	118	120.4
Secondary lead (from scrap)	...				26.7	18.3	15.2	4	9.6
Total lead produced	...	...			111.7	114.7	130	122	130

(6) BALANCE SHEET OF LEAD FOR SOME "HAVE-NOT" NATIONS.

In 1,000 Long Tons.

[p=production, i=imports, e=exports,² b=balance for consumption or addition to stocks.]

Years	Germany.					Italy					Japan.				
	p	i		e	b	p	i		e	b	p	i		e	b
1928	111.7	148.3	260	47.3	212.7	20.9	27.2	48.1	15.1	33	4.3	63.2	67.5	2.2	65.3
1929	114.7	136.9	251.6	55.8	194.8	22.3	24.8	47.1	10.8	36.3	3.6	62	65.6	2.1	63.5
1930	127.1 ¹	86.2	213.3	70.4	142.9	24	18.6	42.6	12.9	29.7	3.6	56.4 ¹	60	2	58
1933	130	48.7	178.7	46.2	132.5	24	9.3	33.3	4.3	29	7.5	68	65.5	3.1 ²	72.4
1934	122	48.4	170.4	23.7	146.7	47	6.6	43.6	4.2	49.4	9	95.9	104.9	4.9 ³	100
1935	130	54.1	184.1	24	160.1	42	6.6 ⁴	48.6	4.2 ⁴	44.4	9	91.8	100.8	4.8	96

¹ Estimate. ² Metal content of ores assumed to be 73 per cent. of weight of ore.³ Slightly incomplete. ⁴ Figure for 1934 repeated, as that for 1935 is not yet available.

7.—MANGANESE.

(1) PRODUCTION OF MANGANESE ORE.

					In 1,000 Metric Tons			
					1929.	1932.	1934.	1935.
Germany ¹	...	...	...	...	182	21	129	192
Czechoslovakia	...	...	...	...	97	34	59	
U.S.S.R.	...	...	...	...	1,184	826	1,820	2,378
U.S. ¹	...	...	...	...	1,321	44	253	
Brazil	...	...	...	...	293	20 ²	2 ²	61 ³
India	...	...	...	...	1,010	216	413	225
Egypt	...	...	...	...	192	3	1	1
Gold Coast ³	...	...	...	...	426	52	345	405
World	...	...	...	...	3,658	1,270	2,967	

¹ With widely-varying contents of metal. ² Exports.

(2) MANGANESE ORE IN INTERNATIONAL TRADE.

				In 1,000 Metric Tons.				
				1929.	1930.	1931.	1932.	1933.
Total exports	...	...	...	2,696	2,110	1,402	769	1,360
								1,660

210 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

8.—NICKEL.

(1) PRODUCTION.

	In 1,000 Metric Tons.						
	(a) Nickel Ores.			(b) Nickel Metal.			
	1929.	1932.	1934.	1929.	1932.	1934.	1935.
Greece	4	20	29	4	20	22	
New Caledonia...	136	92	118 ¹	136	92		
Canada	1,807	717	1,392 ¹	50	14	58	63
Norway	24	23	24 ¹	24	23	29	

¹ 1933.

(2) PRICES.

	In RM per 100 Kg. Annual Averages.						
	1930.	1931	1932.	1933	1934.	1935.	July, 1936.
Nickel, Great Britain, London ...	342.39	351.86	346.16	320.41	262.88	243.44	249.06

9.—QUICKSILVER (MERCURY).

PRODUCTION.

	In 1,000 Kg.			
	1929.	1932.	1934.	1935.
Spain	2,476	816	1,096	1,232
Italy	1,998	1,016	441	972
U.S.S.R.	120	200	267	
U.S.	816	435	532	604
Mexico	83	235	158	216
World	5,583	2,831	2,089	3,378

10.—TIN.

(1) PRODUCTION OF TIN ORES.

	Metal Content in 1,000 Metric Tons.						
	British Malaya.	Dutch Indies.	Stam	Bolivia.	Nigeria.	U K.	World.
1913	52.2	20.9	6.9	26.7	3.9	5.4	135.5
1923	40	29.6	7.8	30.2	6	1	131.1
1924	47.7	32.1	7.9	32.1	6.3	2	143
1925	48.9	33.2	6.9	33.1	6.6	2.4	148.1
1926	48.5	33.5	7.6	30.1	7.2	2.4	145.2
1927	55	35.9	7.7	34.4	7.7	2.6	159.3
1928	65.4	35.5	8.6	41	9.3	2.5	178.8
1929	70.5	31.2	11.1	47.1	10.9	3.3	195.1
1930	65	35.1	12.1	38.8	8.7	2.5	177.5
1931	55.8	27.8	11.3	31.2	7.2	.6	149.6
1932	30.2	17.1	9.8	20.9	4.4	1.4	98
1933	25.3	12.7	10.7	15	3.8	1.6	89.4
1934	34.7	20	10.8	21	5.1	2	118.1
1935	43.3	25	9.9	27.6	7.1	2.1	149.8

(2) PRODUCTION OF TIN

	In 1,000 Metric Tons.							
	Germany.	U.K.	Holland.	China.	Dutch Indies.	Straits Settlements.	U.S.	
1913	12	22.7		6.1	20.5	65.6		132.5
1923	2.4	31.5		8.9	74		34.2	125.6
1924	2.5	36.6		7.1	88		28.8	135.9
1925	1.5	39.6		8.5	90.7		28.1	140.1
1926	2.3	42.7		6.6	93.5		30.3	147.7
1927	6.2	43.7		6.2	99.1		23.5	158.1
1928	4.7	53.2		6.9	14.2	100.4	32.5	185.1
1929	2.7	56.3	.7	6.9	13.6	107.2	31.1	195.1
1930	2.9	48.1	1.9	6.6	14.6	98.5	23.8	179.6
1931	3.7	36.2	2.6	6.8	13	88.9	18	156.2
1932	1.9	29	3.8	7.1	8.2	50.7	13.4	107.4
1933	1.7	18.5	5.1	7.7	9	47.7	20	101.3
1934	2.2	26.9	13.6	8.2	10.7	50.4	22.6	124.2
1935	2.1	30.5	15.9	9.9	11.5	61.5		146.4

(3) FOREIGN TRADE IN TIN ORES AND TIN METAL.

		Exports in 1,000 Metric Tons						
		1929	1930.	1931	1932	1933	1934.	1935.
Tin ores	...	147	131	109	77	64	92	
Tin metal	...	170	159	131	94	121	111	141

(4) FOREIGN TRADE IN TIN IN SOME COUNTRIES.

In 1,000 Metric Tons.

i=imports; e=exports; aa=annual average.

		1913	1919	1920	1921	1922	1923	1924	1925	1926	1927.	1928	1929.
Germany ²	i ...	14		5	5		6	9	13	11	16	13	18
	e ...	6		2	6		2	3	3	4	6	6	5
U.K.	i ⁴ ...	46	23	29	12	25	14	17	16	14	14	16	15
	e ⁴ ...	12	15	13	10	13	20	18	26	27	27	23	30
U.S. ¹	i ore					aa	5,812			aa	1926/30	194 ²	
	i ³					aa	132			aa	1926/30	177	

		1930.	1931.	1932.	1933.	1934	1935.
Germany	i	15	14	12	15	13	
	e	5	5	3	4	2	
U.K.	i ⁴ ...	12	12	4			
	e ⁴ ...	23	12	13			
U.S. ¹	i (ore)		30 ²	17 ²	24 ²	22 ²	
	e ³ ...		148	78	143	90	

¹ Quantitative statistics of exports not printed in Statistical Abstract. ² Tin content.³ In million lbs.; bars, blocks, pigs, etc. ⁴ Blocks, ingots, bars and slabs.⁵ Raw, scrap and compounds.

212 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(5) STOCKS OF TIN ON WORLD MARKET.

In 1,000 Metric Tons. Annual Averages.											
1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	June, 1936.
24.2	17.6	16.2	19.9	28.3	43.8	57.2	59.1	43.7	21.8	17.4	15.7

(6) PRICE OF TIN.

	In RM per 100 Kg. Annual Averages													July, 1936.
	1913	1925.	1926.	1927.	1928.	1929	1930	1931.	1932.	1933	1934	1935.		
London :														
blocks	405.65	522.37	582.10	576.92	456.00	411.67	285.59	221.97	196.92	265.46	286.11	271.85	229.14	
New York	415.76	535.66	604.08	596.68	466.68	418.15	293.71	226.86	203.98	277.32	288.06	276.86	236.21	

11.—ZINC (Spelter).

(1) PRODUCTION OF ZINC ORES.

	Metal Content of Ores ; in 1,000 Metric Tons											
	1913.	1925.	1926	1927.	1928.	1929.	1930.	1931.	1932	1933	1934	1935.
Germany ...	244	49	79	111	117	125	131	99	72	85	105	108
Italy ...	63	69	71	85	85	87	70	42	32	25	40	50
Norway ...	—	—	—	—	—	1	8	7	9	10	7	6
Poland ...	—	122	116	97	90	94	97	75	25	42	53	45
U.S.S.R. ...	—	—	—	—	11	11	18	20	17	22	32	46
Sweden ...	17	19	21	24	14	30	30	29	25	25	29	30
Spain ...	67	49	53	47	43	53	50	39	35	35	32	33
India ...	4	43	46	61	65	56	62	46	42	56	56	59
Indochina	15	21	25	22	22	19	16	8	5	5	5	4
Algeria ...	37	24	26	26	15	15	8	4	2	3	2	2
Northern Rhodesia	—	2	1	—	13	23	20	7	—	19	20	21
Canada ...	7	81	99	102	124	141	121	108	78	90	136	145
U.S. ...	375	645	703	652	631	657	540	372	259	349	399	469
Mexico ...	7	46	105	137	162	174	143	151	88	89	125	136
Australia ...	220	141	153	174	150	157	122	175	118	126	139	151
World ...	1,139	1,312	1,558	1,585	1,565	1,704	1,511	1,164	929	1,144	1,374	1,493

(2) PRODUCTION OF ZINC.

Excluding Zinc Dust; in 1,000 Metric Tons																	
	1913.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	
Germany	279	102	42	35	41	63	74	90	105	108	101	49	45	51	71	123	
Holland.	24	6	13	16	18	21	25	26	27	26	23	19	16	19	20	14	
Belgium	204	66	112	147	162	171	190	202	206	198	176	135	96	137	175	184	
France	68	24	40	49	58	64	75	83	93	87	87	57	46	56	51	52	
U.K.	66	6	19	32	39	39	18	43	56	59	49	22	27	46	55	64	
Norway	9	2	2	4	5	7	5	6	—	6	35	40	39	45	45	45	
U.S.S.R.	8	6	85	96	93	114	124	150	162	169	174	131	85	83	93	85	
Poland	—	—	3	4	6	7	8	7	11	16	19	17	18	23	25	28	
Italy	—	1	—	—	—	—	—	—	10	12	18	7	—	19	20	21	
N. Rhodesia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
U.S.	360	213	384	522	523	573	650	598	682	697	542	330	231	359	390	382 ¹	
Canada	3	24	26	27	45	50	68	75	74	78	110	108	78	83	123	136	
Mexico	7	5	3	19	18	1	6	6	11	17	19	35	30	28	27	40	
Japan	2	10	13	14	14	17	17	17	19	22	25	25	27	31	32	32	
Australia	4	2	24	42	47	47	48	49	51	53	56	55	45	55	56	69	
World	1,001	437	708	948	1,006	1,135	1,233	1,418	1,403	1,457	1,460	1,001	783	988	1,172	1,335	

¹ Incomplete.

(3) WORLD EXPORTS.

		In 1,000 Metric Tons.						
		1929.	1930	1931.	1932.	1933.	1934.	1935.
Zinc ores	...	1,258	1,192	916	708	923	1,004	970
Zinc metal	...	452	440	445	358	398	450	446

(4) STOCKS AND PRICES.

	Unit	1913	1925	1926	1927	1928.	1929.	1930	1931	1932	1933.	1934	1935
Stocks ¹	1,000 tons									303	253	224	
Price, U.S., New York, spot	R M per 100 Kg	43.14	73.98	71.20	61.02	58.98	63.24	42.22	34.17	26.46	29.07	22.96	23.80

¹ Only those of the International Zinc cartel, U.S. and U.K.

12.—METALS OF THE PLATINUM GROUP, PRODUCTION.

	1928.	1933	1934		1928	1933	1934
A. Platinum				B. Palladium			
U.S.S.R. ...	3,110	3,110		Canada ...	370	965 ²	2,610 ²
Columbia ...	1,665	1,429	1,703	U.S. ...	160	29	
Canada ...	328	770	3,615	C. Osmium and Iridium			
Union of S. Africa ...	736	74	1,174	Union of S. Africa ...	176	209	158
Ethiopia ...	101	100		Australia ...	57	18	
Sierra Leone	17 ¹	13	15	U.S. ...	66	60	
Japan ...	3	6		D. Other Platinum metals			
U.S. ...	1,616	1,549		Canada ...	53		
Australia ...	11	4		U.S. ...	11	3	
New Zealand	1	1					

This table comprises only primary productions.

¹ 1930. ² Including Osmium, Iridium, Rhodium, Ruthenium.

13.—MINOR METALS.

A. Antimony.

PRODUCTION ; METAL CONTENT OF ORES.

	In Long Tons.					
	1928.	1929	1930.	1933.	1934.	1935.
Austria	1,125	700	—	—	—	
Czechoslovakia ...	1,189	684	378	1,341	1,142	1,900
France	1,138	1,200	1,300	379	261	
Italy	282	378	413	358	346	446
French Morocco ...	221	177	nothing ³			135
Mexico	3,521	2,667	2,984	1,919	2,626	4,498
U.S. ¹	37	nothing		524	361	39
Bolivia ²	3,487	3,719	?	1,866	1,182	3,348
China	20,741	23,581 ⁴	18,060 ²	13,100	15,200	18,000
World ⁴	30,000	31,000	27,000	21,000	22,000	30,000

¹ Excluding recovered metal ² Exports. ³ Spanish Morocco, 1934 : 309. ⁴ Estimates.

B.—Bismuth.

(1) PRODUCTION, BISMUTH ORE.

	In Cwts.					
	1928.	1929	1930	1933.	1934.	1935.
Australia	152	66	83	53	279	470
Germany	1,610	940		—	—	
Rumania						280
Spain	2,539	2,323		1,516	3,543	
Argentina	417	145		—	180	

(2) PRODUCTION, BISMUTH CONTENT OF ORES, OR METAL.

In addition to (1).

	In Cwts.					
	1928.	1929.	1930.	1933.	1934.	1935.
Canada	125	1,735	114	699	2,265	123
Germany				—	—	80
Spain	469	219	?	512	905	
Mexico				923	2,033	4,204
Bolivia (exports) ...	2,679	2,974		37	993	412
Peru	—	613		5,756	5,368	
China				350	570	
Japan	633	984	1,079	1,124	991	

216 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

C.—Cadmium, Production. D.—Cobalt, Production.

	In 1,000 lbs. Avoirdupois.			In 1,000 Cwts.		
	1928.	1929.	1930.	1933.	1934.	1935.
<i>Cadmium.</i>						
Canada	492	774	457	246	294	581
Australia	387	446	510	357	380	490
France	104			88	—	267
Germany ¹	100	100	100			
U.S.	2,116	2,915	3,094	2,678	3,344	3,985
U.S.S.R.					6	26
Mexico	779	1,413	1,208	1,107	848	1,317
South West Africa				—	140	320
Belgium	11 ^a	5 ^a	11 ^a	355	498	333
Norway				308	302	260
Poland	9	8		114	316	248
Italy			27 ¹	16	18	35
<i>Cobalt.</i>						
Canada	8.5	8.3	6.2	4.2	5.3	6.1
India	.2	2.2		2.3	3.5	4.3
Australia	.2	.4	.1	.1	.2	
Belgian Congo ...	9	13.9	14	12.2		
N. Rhodesia				2.3	11.4	8.2
French Morocco ...				1.4	3.3	8.2

¹ Estimates. ^a Exports.

E.—Molybdene, Production. F.—Radium. G.—Strontium, Production.

(a) MoS₂ content of ores.

(b) Ores.

Radium content of
compounds produced

Unit.	1928.	1929	1930.	1932.	1933.	1934	1935.
E. Canada (a)	—	258	—				
Australia (b)	40	10	105		208	89	212
Norway (a)	3,287	3,478	4,193		8,149	4,793	12,736
Fr. Morocco (a)	787	20			3,700	2,850	3,230
Mexico (b)					1,303	15,315	22,528
U.S. (a)	29,725	34,863			84,554	139,315	171,310
Japan and Korea (b)	609	582	520		2,070	2,136	2,077 ¹
F. Czechoslovakia } gr. ...		3.5		3.8	3.3	7.8	
Belgian Congo }		60		6	6.7		
G. U.K.	7,126	5,329	5,141		3,862	9,440	4,510
Germany } long tons ...	857	717	359		148	341	182
Tunisia }			500				

¹ Incomplete.

H.—Thorium.

Production of Monazite
in Long Tons.

I.—Titanium.

Production of Titanium Minerals
in 1,000 Long Tons.

	1928.	1929.	1930.	1933.	1934.	1935.
<i>Thorium.</i>						
India	103	180	14	139	1,009	3,819
Ceylon	85					
Brazil	100	88	15	401		
Egypt						11
<i>Titanium.</i>						
Canada	2	2.2	.4	—	1.8	2
India	25.3	23.7	28.8	53	75.6	127.1
British Malaya				.2	.1	3
Norway	7.9	7.8	7.5	22.9	26.1	37.5
Portugal	.7	.1	.8	.4	.3	
French Senegal	6.9	8	5.2	.3	.5	12
Argentina				2.6	1	
Brazil	1.5	6.3	.1	.1	.1	.3

J.—Tungsten (Wolfram). K.—Uranium Minerals. L.—Vanadium.
Production.

(a) Ores; (b) concentrates (about
60% WO₃ content); (c) WO₃
content; in 1,000 Long Tons.

Production
in Cwts.

Production of Ores
in Long Tons.

	1928.	1929.	1930.	1933.	1934.	1935.
<i>Tungsten.</i>						
India (a)	.8	1.3	2.5	2.1	3.3	3.8
British Malaya (b)	.1	.5	1	1	1.6	1.7
Portugal (b)	.1	.3	.5	.4	.7	1.1
U.S. (b)	1.1	.7	.6	.8	1.8	2.1
Bolivia (b)		1		.2	.8	1.3
China (a)	7.3	8.7	8.6	5.6	6.2	
French Indochina (c)	.1	.1	.1	.1	.2	.3
Japan and Korea (c)				.1	.3	
<i>Uranium.</i>						
Canada				300 ¹	250 ¹	
Czechoslovakia (U ₃ O ₈ content)	378	316	259	236	236	
Portugal	2,815			1,233	791	117
U.S. (U ₃ O ₈ content)		232		18	70	232
<i>Vanadium.</i>						
South West Africa	5,033	3,036	4,461	177	324	1,570
World ¹	5,160	5,000	5,000	220	330	2,000

¹ Estimates.

B.—NON-METALLIC MINERALS

I.—COAL.

(1) GEOLOGICAL STOCKS DOWN TO 6,600 FEET.(a)

(a) *Estimate of the XIIth International Geological Congress, Toronto, 1913.*

In 1,000 Million Metric Tons.

	Cer- tain.	Certain and Probable.		Cer- tain.	Certain and Probable.
Germany	89 ¹	181 ¹	China	19	217
Belgium	7	11	India		78
France	5	17	French Indochina		20
Great Britain ...	141	190	Japan and Korea ...	1	8
Netherlands ...	3	5	Russian Asia ...		352
Poland	10	158	ASIA	22	680
U.S.S.R.		64 ³	OCEANIA	3	148
Spain	6	8	Belgian Congo ...		5
Norway		9	Rhodesia	1	1
Czechoslovakia ...	7	25	Union of S. Africa ...		56
EUROPE	270 ²	671 ²	AFRICA	1	57 ⁴
Canada	185	666	Total non-European territories	722	4,316
U.S.	511	2,736	WORLD	992	4,989
Chile	2	3			
AMERICA	698	3,434			

¹ Later estimate only 26 and 44. ² id. 203 and 534. ⁴ id. 225.

(a) In these tables on coal, brown coal has been converted into coal at the rate of .402 : 1.

(b) *American Estimate.*

In 1,000,000 Millions.					
North America ...	4.97	Australasia		17	
Asia	1.40	Africa		06	
Europe	.76	South America ...		04	
WORLD	7.40				

(2) PRODUCTION BY COUNTRIES.

	In Million Metric Tons.						
	1913.	1928.	1929.	1930	1933.	1934.	1935.
U.K.	292	232.5	258	243.9	207.1	220.7	222.3
Union of S. Africa	8	12.4	12.8	12	10.5	12	13.4
Canada	14	15.7	15.6	13.3	10.6	12.4	12.4
India	16	22.6	23.4	23.8	20.3	22.7	23
Australia	13	13.4	12.1	9.5 ¹	11.7	12.2	13.1
Belgium	23	27.1	26.5	27	24.9	26	26.1
Czechoslovakia ...	—	34.5	38.5	33.1	25.2	25.4	25.8
France ²	41	41.6	54.1	54.2	47.2	47.9	47.3
Germany ³	238	324.4	346	297.1	243.2	269.1	287.5
Italy	—	.8	1	1	.8	.8	1
Holland	2	10.7	11.6	12.2	12.5	12.2	11.8
Poland	—	40	45.6	36.9	26.9	28.8	28.1
U.S.S.R.	37	35.2	38.1	45.7	74.7	82.5	102.2
U.S.	517	514.4	541.2	474	342.1	371.9	375.3
China	—	25	25	—	18.5	20.6	1.2
Japan ⁴	—	34.8	35.3	31.9 ¹	45	51.4	—
WORLD	1,268	1,440	1,430	1,390	1,150	1,260	1,290

¹ Incomplete ² Without Saar. ³ Including Saar.⁴ Including Asiatic possessions and, for 1933 and 1934, Manchuria.

Source: "The Mineral Industries of the British Empire," etc.

(3) WORLD PRODUCTION OF COAL.

In Million Metric Tons.								
1909-13 Annual Average	1913	1920	1921.	1922.	1923	1924	1925.	1926.
1,098	1,268	1,193	993	1,057	1,201	1,188	1,188	—
1927.	1928	1929.	1930.	1931	1932	1933.	1934	1935.
1,357	1,335	1,421	1,298	1,149	1,023	1,057	1,156	1,260

Source German Statistical Abstract.

(4) PRICES.

RM per to	Annual Averages							
	1913	1930.	1931	1932.	1933	1934.	1935.	July, 1936.
Germany: Rheimsch-Westf. Fettförderkohle, f o b mine	12.34	16.76	15.40	14.21	14.21	14.05	14	14
U.K.: Cardiff, best Admiralty, f.o.b.	21.11	21.11	18.73	14.12	13.34	12.11	11.72	11.99

(5) WORLD EXPORTS.

	1929.	1930.	1931.	1932.	1933.	1934.	1935.
<i>Coal.</i>							
Quantity, million tons	155	141	124	101	103	111	112
Value, R.M. million ...	2,825	2,586	2,042	1,352	1,205	1,138	1,095
<i>Brown Coal.</i>							
Quantity, million tons	3.6	2.8	2.4	1.8	1.9	2.1	2
Value, R.M. million	56	43	36	20	19	19	18

(6) EXPORTS AND IMPORTS, BY COUNTRIES, 1934.

In 1,000 Metric Tons.					
Countries.	Net Imports.	Net Exports.	Countries.	Net Imports.	Net Exports.
Germany ...		17,075	Austria ...	2,587	
Belgium and Luxembourg ...	670		Sweden ...	5,265	
Denmark ...	3,801		Poland ...	9,880	
France ...	13,720		U.S.S.R. ...		2,167
Great Britain ...		53,997	Switzerland ...	1,900	
Irish Free State...	2,343		Japan ¹ ...		3,322
Italy ...	11,781		Canada ...	11,462	
Holland ...	2,762		U.S. ...		11,638
Norway ...	2,065				

¹ Including Manchuria; 1933

2.—OIL.

(1) GEOLOGICAL STOCKS.

(a) Estimate by V. R. Garfias, 1923.

Countries.	Probable Capacity of Production of Fields worked at the end of 1932 in Million Metric Tons	Future possibility of Production at the Rate of 1932 Years.	Countries.	Capacity of Production in Million Metric Tons.	Future possibility of Production at the Rate of 1932. Years.
U.S. ...	1,715	15	Trinidad ...	13	9
U.S.S.R. ...	429	20	Poland ...	7	12
Irak ...	357	?	Japan ...	6	20
Iran ...	314	52	Sarawak ...	4	14
Venezuela ...	286	17	Canada ...	1	14
Dutch East Indies	143	29	Egypt ...	1	7
Rumania ...	71	10	Germany ...	1	7
Colombia ...	57	29	Ecuador ...	1	7
Mexico ...	43	11	France ...	7	10
India ...	14	12	Other Countries	1	2
Peru ...	14	9			
Argentina ...	14	7	WORLD ...	3,495	19

(b) *Estimate of the American Petroleum Institute.*

Published after the War.

In Million Metric Tons.					
Countries.	Estimated Resources.	Per Cent. Totals	Countries.	Estimated Resources.	Per Cent. Totals.
South and Central America ...	1,322	23	Balkans ...	162	3
U.S. ...	1,000	17	Indonesia ...	142	3
U.S.S.R. ...	964	17	Canada ...	142	3
Near Orient ...	833	14	Africa ...	132	2
Mexico ...	646	11	WORLD ...	5,774	
India ...	431	7			

This does not include the resources of Persia.

An estimate published in 1920 by Mr. David White enhances the total quantity to 8,000 million metric tons.

(2) PRODUCTION OF OIL.

(a) *World Production, 1913-1935.*

In Million Metric Tons.											
1913	1920.	1921.	1922.	1923	1924.	1925	1926.	1927.	1928.	1929.	1930.
53	99	107	120	142	141	148	152	174	183	207	197
1931.	1932.	1933.	1934	1935							
190	181	197	208	226							

(b) *Production in Important Countries.*

In Million Metric Tons.									
							1913.	1928.	1934.
U.S. ...	...	...	...	...	...	...	34	124	123
Mexico ...	...	...	...	...	...	...	4	8	6
Venezuela ...	...	...	...	...	...	...	—	16	20
Peru ...	...	...	...	...	...	...	3	2	2
Argentina ...	...	...	...	...	...	...	—	1	2
Colombia ...	...	...	...	...	...	...	—	3	2
Trinidad ...	...	...	...	...	...	...	—	1	2
Iran ...	...	...	...	...	...	...	2	6	8
Dutch East Indies ...	...	...	...	...	...	...	2	4	6
India ...	...	...	...	...	...	...	1	1	1
Sarawak ...	...	...	...	...	...	...	—	1	3
Japan and Formosa ...	...	...	...	...	...	...	3	3	2
Northern Sachalin (Japanese Concession) ...	...	...	...	...	...	...	—	1	3
U.S.S.R. ...	...	...	...	...	...	...	9	12	24
Rumania ...	...	...	...	...	...	...	2	4	8
Germany ...	...	...	...	...	...	...	1	1	3
Poland ...	...	...	...	...	...	...	?	7	5
WORLD ...	...	...	...	...	...	...	54	184	209

222 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(3) WORLD EXPORTS.

Quantities in 1,000 Metric Tons ; =q.

Value in RM. Million ; =v.

			1929	1932.	1933.	1934.	1935
Crude Petroleum	q	...	31,038	27,061	29,170	33,645	
	v	...	1,006	608	571	691	
Light fuel oil	q	...	12,339	11,750	10,537	10,762	11,023
	v	...	2,044	910	700	616	624
Lighting oil	q	...	5,988	4,175	3,917	4,128	3,949
	v	...	661	241	197	164	156
Heavy fuel oil	q	...	14,250	15,826	17,485	19,808	
	v	...	501	337	373	406	
Lubricating oil	q	...	2,154	1,527	1,795	1,857	1,910
	v	...	583	296	276	233	239
Totals, value in million RM.			4,795	2,392	2,117	2,110	

(4) INTERNATIONAL TRADE, 1934.

I=Imports ; E=Exports.

In 1,000 Metric Tons										
	Crude Petroleum.		Light Fuel Oil.		Lighting Oil.		Heavy Fuel Oil.		Lubricating Oil.	
	I.	E.	I	E.	I	E	I.	E	I	E.
Germany ...	277		1,158		98		956		322	72
Belgium-Lux ...	226		268		28		327	269	200	106
France... ..	4,322		1,054		38		516	295	156	
U K.	1,939		3,682	186	784		3,230	143	394	
Italy	143		348		150		1,122		66	
Holland ...	141		336		188		379	50	45	
Austria ...	166		48							
Sweden ...	63		351		95		253		48	
Czechoslovakia	121		121							
Rumania ...		274		1,958		1,085		3,117		62
U.S.S.R. ...		459		1,120		436		1,951		305
Denmark ...			256		80		237			
Irish Free State			115		60					
Norway ...			108				301			
Switzerland ...			219				163			
Spain			440				352			
Hungary ...	229									
Poland and Danzig				56		31				
Greece							140			
Egypt	113		13	28	265		163	64		
Algeria			126							
Union of South Africa ...			301				110			

In 1,000 Metric Tons.										
	Crude Petroleum		Light Fuel Oil		Lighting Oil		Heavy Fuel Oil		Lubricating Oil	
	I.	E.	I.	E.	I.	E.	I.	E.	I.	E.
Japan	2,958		613							
Iran		1,565 ¹		1,524 ¹		445 ¹		3,741 ¹		
Dutch Indies ...		484		1,455		573		2,253		
Sarawak		15		93		14		535		34 ¹
British Malaya ...			412	326	93	55	353	250		
China			110		360		409			
Manchuria			54		75				35	
Philippines			75		56		288			
India					235		415		71	
Argentina	170		61				917	119	18	
Canada	4,264		210				236		40	
Dutch West Indies ...	13,954 ¹	1,203 ¹		2,210 ¹		281 ¹	929 ¹	9,855 ¹		110 ¹
U. S.	4,972	5,716	16	2,689		1,210	2,133	5,596		1,007
Colombia		2,351								
Ecuador		172								
Mexico		1,641		264 ¹		750		1,116		46
Peru		1,351		389				196		
Venezuela		18,780						805		
Brazil			265		93		452		281	
Chile			53 ¹				213 ¹			
Cuba			32 ¹				218 ¹			
Trinidad and Tobago	24 ¹									
Uruguay	80 ¹	65		303			183 ¹	996		
Australia	532		690		112				46	
New Zealand ...			214				173			

¹ 1933.

(5) STOCKS OF PETROLEUM AND PROCESSED PRODUCTS, IN HANDS OF PRODUCERS IN U.S.

In Million Hektoliters.											
1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	June, 1936.
858	839	895	981	1,059	1,095	1,015	981	951	925	883	866

(6) PRICES.

	In RM. per 100 l.						
	1913.	1930.	1931.	1932.	1933.	1934.	1935. July, 1936.
<i>Crude Petroleum:</i>							
New York, Pennsylvanian, free well ...	6.47	6.37	4.70	4.81	3.17	3.38	2.96 3.41
<i>Lighting Oil:</i>							
New York, standard white, spot, in chests ...	?	18.43	17.76	18.47	14.56	10.75	10.70 10.68
<i>Benzine:</i>							
New Orleans, 60/62 Bt ...	?	9.46	5.20	4.78	3.74	3	3.25 3.54

3.—ASBESTOS, PRODUCTION, BY COUNTRIES.

	In 1,000 Metric Tons.						
	1928	1929.	1930	1931.	1933.	1934.	1935.
Southern Rhodesia ...	35.7	38.1	33.7	21.8	26.9	28.8	38
Union of South Africa ..	24.2	28.7	23.1	11.7	15.2	16.2	18.2
Cyprus ...	16.3	14.1	7.3		3.5	7.1	7.5
U.S.S.R. ...	26.1	29.1	56	64.7	73	91	100
Canada ...	265.5	294.8	251	137.2	147.2	143.4	190.6
WORLD ...	379	414	379	243	279	303	374

4.—SALT, PRODUCTION.

In 1,000 Metric Tons.			
Africa ...	580	U.S.S.R. ...	2,900
U.S ...	6,899	Oceania ...	112
Rest of America	562	Europe outside	
		U.S.S.R. ...	10,380
India ...	1,740	Germany ...	2,268
Rest of Asia ...	1,610	France ...	2,130
		Italy ...	1,054
		Poland ...	450
		U.K. ...	2,402
		WORLD ...	24,800

5.—MINERAL FERTILISERS.

(1) PRODUCTION.

Countries.	In 1,000 Metric Tons.									
	Potash Content of K ₂ O		Natural Phosphates.		Super- phosphate.		Basic Slag.		Natural Guano.	
	1928.	1934.	1928	1934.	1928.	1934.	1928.	1934.	1928.	1934.
Germany ...	1,432	1,179			792	720	1,639 ²	1,400 ³		
France ...	407	379	180	71 ¹	2,265	1,324	1,594	988 ¹		
Spain ...	24	110			895	967 ¹				
Poland ...	58	58 ¹			240	90				
U.S. ...	54	131	3,580	2,720	4,071	2,602				
U.S.S.R. ...			122	712 ¹	151	850				
Algeria ...			876	532						
Tunisia ...			2,789	1,766						
French Morocco			1,268	1,199						
Egypt ...			201	438						
Dutch West Indies			104	86 ¹						
Xmas Island			114	130						
Japanese Empire			138	150	976	1,083				
Nauru and Ocean Island			552	558 ¹						
Faomotu Islands			187	77						
U.K. ...					507	494 ¹	222	266		
Belgium and Luxemburg					400	290 ¹	1,554	1,003 ¹		
Holland ...					645	559				
Italy ...					1,151	1,083				
Australia ...					732	759 ¹				
Chile ...									3.2	11.1 ¹
Peru ...									125.5	162.4 ⁴
India ⁴ ...									10.7	4.7
Union of South Africa									9.2	5
Seychelles ⁴ .									15.4	12.3

¹ 1933. ² Saar 330 ³ Saar 323. ⁴ Exports

In addition to the materials mentioned in this table Chile produced the following quantities of *Sodium Nitrate*: 1928, 3.1, 1934, .5 million metric tons.

(2) PRODUCTION OF NATURAL NITRATES IN CHILE; NITRATE OF SODA.

				In 1,000 Long Tons					
				1928.	1929.	1930	1933	1934	1935.
Production	...	...	...	3,113	3,186	2,403	528	1,115	1,201
Exports	...	...	...	2,788	2,851	1,757	659	1,274	1,269
Increase (+) or decrease (—) of home stocks	...	...	...	+325	+335	+646	—131	—159	—68
				+ 1,306			— 358		

(3) PRODUCTION OF GUANO.

	In 1,000 Metric Tons.										
	1913	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929
Peru ...	29	51	64	63	111	137	126	80	78	125	151
WORLD	57	79	100	107	147	185	171	120	131	154	177

	1930.	1931.	1932.	1933	1934
Peru ...	133	95	134	162	148
WORLD ...	163	115	170 ¹	211 ¹	

Figures before 1932 from the Statistical Year Book of the League of Nations, afterwards from the German Statistical Abstract

¹ Including Indian "fish guano"

(4) WORLD EXPORTS OF SOME MINERAL FERTILISERS.

	In 1,000 Metric Tons						
	1929.	1930	1931	1932.	1933	1934	1935.
Raw phosphates ...	7,039	6,961	4,330	4,437	5,194	5,799	5,436
Superphosphate and basic slag ...	3,866	3,627	3,291	2,478	2,345	2,696	2,552
Sodium nitrate (Chilean saltpetre) ...	3,002	1,886	1,550	519	804	1,394	1,342
Potash compounds ...	2,452	2,370	1,864	1,317	1,717	2,366	2,475
Ammonium sulphate ...	1,756	1,537	1,772	1,706	1,591	1,457	1,656

(5) PRICES.

	Annual Averages; in RM per 100 Kg.									
	1913	1928.	1929.	1930	1931	1932	1933	1934	1935.	1936.
Great Britain, London, Chile saltpetre ...	23.86	25.98	24.32	22.57	19.55	13.18	11.50	9.75	9.36	9.53 ¹
Basic slag, 15% P ₂ O ₅ , Aachen, Germany ..	132	91.36	88.98	83.40	78.77	73.18	70.08	67.50	65.25	71.00 ²

¹ Monthly average, July. ² Idem, June.

6.—SULPHUR.

(1) PRODUCTION OF BRIMSTONE AND IN PYRITES.

	In 1,000 Metric Tons									
	Brimstone.					Sulphur Content of Pyrites Mined.				
	1928.	1929.	1932	1931	1935.	1928.	1929	1932	1934.	1935.
Italy ...	328	315	231	251	329	257	306	238	372	
Germany ...						146	150	75	97	118
France ...						92	92	87	69	
Greece ...						45	64	42	23	
Yugoslavia ¹ ...						64	60	16	23	80
Norway ...						322	324	319	425	396
Portugal ...						122	193	112	102	100
U.S.S.R. ...						152		242 ²	382	
Sweden ...						12	32	50	104	
Spain ...	21	24	17	43		1,572	1,815	1,219	1,320 ³	
Cyprus ...						124	149	81	101	
Japan ...	70	66	85	128	152	270	280	330	491	
Canada ...						35	39	48	5	13
U.S. ...	2,014	2,400	905	1,450	1,659	115	122	68	170	
Chile ...	16	16	12	21	21					

¹ Pyrites without regard to proportion of sulphur contained in them. ² 1930. ³ 1933.

(2) SULPHUR BALANCE SHEET OF THE "HAVE-NOT" POWERS.

	In 1,000 Metric Tons								
	Germany.			Italy.			Japan.		
	1933.	1934	1935	1933.	1934	1935.	1933.	1934	1935.
Production pyrites, sulphur cont.	80.3	95.1	122.5	330.4	366	372	409	500	605
Imports pyrites, sulphur cont.	334	368	401	48.4	47.2	47.2 ¹			
Production brimstone . . .	24.5	27	31	395	360	324	116.2	140	157
Importation brimstone. . .	45.6	52.1	60.1				2.8	2.5	.5
	481.4	562.5	617.6	773.8	773.2	743.2	528	612.5	762.5
Exports pyrites, sulphur cont.	13	7.1	8.6	119.6	126.3	77.4			
Other sulphur . . .	29	28.9	24.4	217.5	215.2	24.8	32.3	45.7	54.5
Total exports	42	36.3	33.4	37.1	341.5	320.2	32.3	15.7	54.5
Balance	412.4	526.2	584.2	136.7	431.7	432	102.7	596.8	708

¹ Figure for 1934 repeated, as figure for 1935 is not yet available

7.—MINOR NON-METALLIC MINERALS, PRODUCTION.

	Graphite Stone in 1,000 tons		Mica in 1,000 Kg.		Siliceous Earth (Diatomaceous Earth) in 1,000 Kg.	
	1928	1933	1928	1933.	1928	1933
Germany	18	20	269	73		
Austria	24	15				
Czechoslovakia	32	1				
Italy	7	3				
France	1				10,000	9,130 ¹
Sweden			12	68	721	650
U.S.S.R.	1		1,493		12,220	
Great Britain					4,312	4,062
Denmark					35,561	21,337
Hungary ¹					3,547	1,266
Spain					250	1,229
Ceylon ²	15	6 ¹				
Japanese Empire	23	17 ¹	29	20 ¹	203 ³	3,042
India ²			4,851	2,932		
Madagascar	17	3 ¹	861	178 ¹		
Union of South Africa			3,629	358		
Southern Rhodesia			186	4		
Tanganyika			34	11		
Algeria					9,000	11,000
U.S.	5		7,803	8,104	117,497	100,529
Canada	1	4	3,320	856	334	1,623
Mexico	5	3				
Australia			12	43	1,382	2,895

¹ 1932. ² Exports. ³ 1929.

C.—VEGETABLE AND ANIMAL RAW MATERIALS

1.—GRAINS (CEREALS), INCLUDING WHEAT, FLOUR AND RICE.

(1) PRODUCTION OF CEREALS IN IMPORTANT COUNTRIES.

(a) *Wheat.*

No.	Countries.	In 1,000 Metric Tons.														1935.	
		1913.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.		1933.
1	Europe ...	53,653 ^a	...	47,924 ^a	...	...	...	56,068	...	...	...	...	...	...	...	75,291	75,267
2	Germany ...	7,972 ^a	2,248	2,934	2,897	2,447	2,437	3,217	2,597	3,280	3,854	3,349	3,789	4,233	5,003	5,604	4,532
3	France ¹ ...	8,692	6,609	8,994	7,500	7,684	7,684	8,936	6,308	7,739	7,655	8,705	6,308	7,338	9,677	9,861	9,000
4	Great Britain ...	1,482	1,549	...	1,618	1,449	1,449	1,440	1,388	1,518	1,354	1,354	1,150	1,028	1,187	1,700	1,899
5	Italy ...	5,835	3,847	5,248	6,119	4,631	4,631	6,555	5,329	5,329	6,221	7,097	5,717	6,748	7,537	8,100	6,333
6	Poland ...	...	497	960	1,354	885	1,354	1,573	1,281	1,476	1,612	1,793	2,240	2,265	1,346	2,174	2,086
7	Russia ² ...	12,189 ^a	...	...	8,976	9,107	9,107	15,706	22,035	20,400	21,590	20,110	29,500	...	20,250	27,727	30,410
8	America ...	29,404 ^a	...	32,128 ^a	...	...	...	35,990	...	...	...	...	...	...	...	31,842	29,235
9	Argentina ...	5,400	4,620	4,620	6,723	5,220	5,220	5,202	6,010	6,509	8,365	3,740	6,422	6,149	6,406	6,978	6,550
10	Canada ...	6,306	7,163	8,977	12,906	7,133	7,133	11,196	11,325	11,087	15,424	8,152	11,449	8,277	12,058	7,341	7,508
11	U.S. ...	20,776	22,672	21,634	21,702	33,751	33,751	35,417	22,652	23,724	24,899	21,950	23,356	24,284	20,251	14,354	13,538
12	Asia ...	14,232 ^a	...	11,440 ^a	...	...	...	11,470	8,844	9,092	7,916	8,595	10,637	9,397	9,169	9,601	12,410
13	India ...	9,876	10,284	6,817	10,142	9,911	9,911	8,836	8,844	9,092	7,916	8,595	10,637	9,397	9,169	9,601	9,582
14	Japan ³ ...	710	770	759	773	691	691	1,090	1,060	1,042	1,072	1,055	1,049	1,085	1,086	1,282	1,549
15	Russian Asia ...	5,496 ⁴	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	Africa ...	2,762 ^a	...	2,568 ^a	...	...	...	3,122	...	...	...	...	...	...	...	3,330	4,138
17	Union of S. Africa	148	221	237	...	...	...	231	181	181	189	291	253	384	289	315	418
18	Australia ⁵ ...	2,659	4,117	3,862 ^a	...	...	...	4,606	3,049	4,606	5,545	3,241	6,011	4,944	6,110	4,967	3,792
19	WORLD, without U.S.S.R. ...	83,271 ^a	...	...	...	...	...	93,005	99,805	109,980	96,998	104,593	103,467	103,350	123,717	131,077	124,843
20	TOTAL, WORLD ...	106,701 ^a	97,921 ^a	85,230	94,337	91,857	91,857	93,005	115,040	120,205	131,570	134,093	143,493	143,493	143,493	143,493	143,493

Note.—Under 1935 is included 1934-35, where this is the harvesting year, etc. ¹ After 1919, including Alsace-Lorraine. ² After 1919, territory of U.S.S.R. in Europe and Asia. ³ Annual average 1915-17, excluding Poland, but including the later Baltic States and Bessarabia. ⁴ Annual average 1915-17. ⁵ Including New Zealand. ⁶ 1914. ⁷ After 1924 including Korea.

^a Annual average, 1909-13. ^b Annual average, 1920-24.

(b) Rye.

Countries.	In 1,000 Metric Tons.													
	1913.	1920.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	
<i>Europe</i> ...	44,009 ²	34, 09 ⁷	44,705		42,093 ²						49,672	43,091		
Germany ...	9,585 ¹	4,934	8,063	6,406	6,834	8,522	8,155	7,679	6,680	8,364	8,727	7,608	7,478	
Poland ...	5,711 ²	1,901	6,539	5,011	5,688	6,110	7,010	6,958	5,702	6,111	7,073	6,464	6,617	
Czecho-slovakia	—	837	1,476	1,166	1,25	1,464	1,834	1,729	1,388	2,176	2,085	1,523	1,638	
U.S.S.R. ...	19,172 ⁴	9,337	19,498	22,030	23,700	19,900	20,220			22,020	24,190	20,130	21,380	
<i>Asia</i> ...	200 ²	100 ⁷	116		101 ⁸						341			
<i>Africa</i> ...	16 ²	19 ⁷	18		21 ⁸						35	28		
<i>America</i> ...	990 ²	1,537	1,180	1,017	1,725 ⁸ 5		1,056 ⁶		276	284	898	961		
<i>Australia</i> ...	6 ²				2 ⁸									
<i>World:</i>											.			
Incl. } U.S.	42,240 ²	36,618 ⁷	46,565		44,840 ⁸									
Excl. } S.R.														

See note to Wheat Production (C1 1(a)); also for explanation of territory covered.

¹ Annual average, 1911-13. ² Annual average, 1909-13. ³ Very rough German estimates⁴ 1914. ⁵ 1913-1932 and 1934 only U.S. ⁶ Annual average, 1926-30.⁷ Annual average, 1920-24. ⁸ Annual average, 1926-28. ⁹ Whole American continent.

(c) Maize.

In 1,000 Metric Tons.														
	1909-13 ¹	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	
<i>Europe</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	
Italy	...	16,454	20,413	3,000	2,220	1,659	2,530	2,997	1,946	3,015	20,481	22,854	2,520	
Yugoslavia	...	2,549 ³	2,793	3,410	2,109	1,819	4,178	3,465	3,203	4,793	3,578	5,154	3,028	
Romania	...	762	3,795	6,083	3,533	2,753	6,386	4,520	6,063	5,993	4,554	4,846	5,379	
Hungary	...	2,730 ³	3,949	4,159	3,533	2,753	6,386	4,520	6,063	5,993	4,554	4,846	5,379	
U.S.S.R.	...	1,506 ⁴	1,883	2,235	1,736	1,101	1,794	1,407	1,518	2,432	1,809	2,098	1,436	
	...	1,335	5,024	3,705	3,780	5,320	4,210	5	5	3,430	4,800	3,840	3,260	
<i>Asia</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	
India	...	4,586	5,100	1,950							7,920	6,305		
	...	2,105 ⁵	1,904											
<i>Africa</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	
Egypt	...	3,185	3,760			1,990		1,775	1,986	1,932	5,490	5,320	1,689	
Union of S. Africa	...	1,540 ⁶	1,961			1,743		1,473	1,389	866	2,168	1,572	1,407	
	...	754 ⁶	988	1,715	1,962	1,743	1,763					1,722		
<i>America</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	
U.S.	...	82,263	84,529	67,186	70,153	72,138	66,606	52,231	65,212	73,867	76,000	55,700	55,934	
Argentina	...	68,897	74,094	8,153	7,700		5,886	10,510	7,454	6,700	59,735	35,072	9,650	
	...	4,869	7,670								6,526	11,500		
WORLD.														
Including U.S.S.R.	...	103,558	114,789	110,098	108,600	106,357	109,287	97,914	110,899	120,458	110,000	90,443		
Excluding U.S.S.R.	...	95,940							100-130 million ⁷		105,200	86,600		

Maize statistics are very incomplete and full of later corrections of figures for earlier years.

¹ Annual average. ² Very rough German estimate. ³ Pre-war territory. ⁴ Annual average, 1911-15. ⁵ Annual average, 1911-13.

⁶ Annual average, 1910-13. ⁷ Annual average, 1920-24.

(d) *World Production of Rice.*

In Million Metric Tons.													
Annual Averages													
1909-13.	1920-24.	1924	1925.	1926.	1927	1928.	1929	1930	1931.	1932.	1933.	1934.	1935
78.2	83.2	86.3	87.7	85.2	84.6	87.6	85.4	90.8	88.3	88.7	90.1		82.5

These figures exclude U.S.S.R., China, Irak and Iran.

(e) *World Harvest of Grains, 1933.*

In Million Metric Tons.							
	Wheat.	Rye.	Barley	Oats.	Maize.	Rice. ¹	Totals.
Europe ¹ ...	75,291	49,642	24,755	43,548	20,881	975	214,692
Asia ...	15,596	341	7,190	435	7,920	79,253	110,735
Africa ...	3,330	35	2,350	864	5,490	1,599	13,668
America ...	31,842	898	5,890	16,370	76,000	803	131,803
Australia ...	4,967		16	60			5,043
WORLD ...	131,077	50,950	40,380	61,030	110,000	82,630	476,067

¹ Including whole of U.S.S.R. ² The figure for rice in Asia is certainly much too low.

(2) INTERNATIONAL TRADE IN GRAINS.

(a) *World Exports, 1929-1935.*

In Million Metric Tons.							
	1929.	1930.	1931.	1932.	1933.	1934.	1935.
Wheat ...	19.1	16.3	19.9	17.3	15.4	13.9	13.9
Rye ...	1.3	1.5	1.8	1.3	1.2	1.1	1
Barley ...	3.9	4	4	2.7	2.7	2.8	2.5
Oats ...	1.6	1.7	1.5	1.3	.9	1.1	1
Maize ...	9.6	8	12.1	10.6	9.6	8.3	9.4
Rice ...	6.7	6.7	7.1	7.3	7	7.6	
Wheat Flour ...	3.8	3.6	3.1	2.7	2.8	2.7	2.6
Other milling products from cereals and rice	.7	.7	.7	.7	.7	.8	.7

232 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(b) World Trade in Grains, etc., by Countries.

I=Imports; E=Exports.

				In Million Metric Tons.													
				1913	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
Wheat:																	
U.K. ...	...	...	<i>I</i>	5.4	5.1	6	4.9	4.9	5.6	5.2	5.6	5.3	6	5.3	5.7	5.2	5.1
			<i>E</i>				1										
Germany ...	...	...	<i>I</i>	2.5	.5	.7	1.7	2.2	2.6	2.5	2.1	1.2	.8	1	.8	.6	.2
			<i>E</i>	.5			.2	.3		.3	.3		.3	.5	.5	.2	—
France...	...	...	<i>I</i>	1.6	1.4	1.5	1.2	.3	2.2	1	1.4	1	2.3	2.1	.8	.7	.7
			<i>E</i>									.4			.3	.8	
Italy ...	...	...	<i>I</i>	1.8	2.8	2.1	2.2	2.1	2.3	2.7	1.8	1.9	1.4	1.1	.5	.5	.5
			<i>E</i>														
India ...	...	...	<i>I</i>							.6	.4	.2	.3		.1		—
			<i>E</i>	1.2	.6	1.1	.2	.2	.3	.1		.2					
U.S. ...	...	...	<i>I</i>		.5	.4	.4	.4	.3	.5	.4	.5	.4	.2	.3	.5	1.1
			<i>E</i>	2.5	2.7	4.5	2.4	3.8	4.6	2.6	2.5	2.4	2.2	1.5	.2	.5	—
Russia ...	...	...	<i>I</i>	.1													
			<i>E</i>	3.3	.3	.3	.4	1	.8			2.5	2.5	.6	.7	.2	.7
Rye:																	
Germany ...	...	...	<i>I</i>	.4	.9	.5	.4	.2	.8	.3	.1		.1	.6	.2	.1	.2
			<i>E</i>	.9			.2	.3	.1	.4	.6	.2	.1	.1	.3	.1	—
U.S. ...	...	...	<i>I</i>														
			<i>E</i>		.8	.9	.7	.3									
Russia ...	...	...	<i>I</i>				.2		.9	.4							
			<i>E</i>	6	1.2	.6	.2	.2	.4			.6	1.4	.4	.2	.1	—
Wheat Flour:																	
U.K. ...	...	...	<i>I</i>	.6	.6	.6	.5	.5	.6	.5	.5	.6	.5	.4	.5	.5	.4
			<i>E</i>	.1	.2	.3	.4	.2	.2	.2	.2	.2	.2	.2	.2	.1	
Germany ...	...	...	<i>I</i>		.1	.6	.4	.1	.1		.1						
			<i>E</i>	.2			.1	.1			.1				.2	.2	
France...	...	...	<i>I</i>													.1	
			<i>E</i>			.1											
Canada ...	...	...	<i>E</i>	.4	1	1	.9	.9	8	1	.9	.7	.5	.5	.5	.4	4
Argentine ...	...	...	<i>E</i>	.1	.1	.2	.1		.2	.2	.1	.1	.1	.1	.1	.1	.1
U.S. ...	...	...	<i>E</i>	1	1.5	1.4	1	1.1	1.1	1.1	1.2	1.2	.9	.5	.4	.4	.3
Barley:																	
U.K. ...	...	...	<i>I</i>	1.1	1	1.1	.8	.6	.8	.7	.6	.8	.8	.5	.8	.8	.9
Germany ...	...	...	<i>I</i>	3.2	.3	.6	.9	1.7	2	1.9	1.8	1.5	.8	.5	.2	.6	.2
France ..	...	...	<i>I</i>	.1	.1	.1					.1	.2	.4	.4	.2	.2	.2
			<i>E</i>	.3	.3	.5	.7	.8	.7	.8	.4	.1	.5	.2		.2	.2
Rumania ...	...	...	<i>E</i>	.4	.8	.3	.2		.7	.4	1.2	1.4	1	.5	.6	.3	.2
U.S. ...	...	...	<i>E</i>	.4	.3	.5	.6	.3	.8	1.1	.6	.2	.2	.2	.2	.1	.2
Russia ...	...	...	<i>E</i>	3.9	.2	.2	.5	.7	?	?	.2	1.2	1.0	.4	.6	.2	.6
Maize:																	
U.K. ...	...	...	<i>I</i>	2.5	1.8	1.9	1.4	1.6	2.1	1.6	1.7	1.6	2.6	2.5	2.6	3	2.9
			<i>E</i>		.1	.1	.1	.1	.1								
Germany ...	...	...	<i>I</i>	.9	.3	.4	.6	.7	2.1	1.3	.7	.7	.5	.8	.3	.4	.3
France...	...	...	<i>I</i>	.6	.6	.6	.5	.6	.8	.7	.8	.8	1.1	1.2	.7	.6	.6
Italy ...	...	...	<i>I</i>	.4	.4	.1	.2	.5	.4	.9	.8	.7	.7	.6	.1	.2	.2
Argentine ...	...	...	<i>E</i>	4.8	2.9	4.5	2.9		8.3	5.4	5	4.7	9.8	7.1	5	5.5	7.1
U.S. ...	...	...	<i>I</i>				.1		.1							.1	
			<i>E</i>	1.2	1.1	.5	.3	.6	.3	.9	.9	.2	.1	.2	.1	.1	
Russia ...	...	...	<i>E</i>	.6		.2	.1	.3	.1			.1	.1	.3	.1	.1	

			1913	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
<i>Oats:</i>																
U.K. ...	...	I	·9	·5	·5	·4	·4	·3	·4	·4	·5	·4	·3	·3	·2	·2
Germany ...	...	I	·5	·1	·4	·3	·3	·2	·1							·2
	...	E	·7	·1	·1	·1	·1	·3	·5	·4				·1		
France...	...	I	·6	·1	·1	·1	·1	·1	·1	·1	·1	·1	·2			
Argentina ...	...	E	·9	·5	·7	·4		·6	·3	·4	·5	·6	·7	·4	·5	·4
Canada ...	...	E	·5	·4	·5	·7	·2	·1	·2	·1		·2	·2	·1	·2	·2
U.S. ...	...	E	·5			·5	·2	·1	·2	·1			·1			
Russia ...	...	E	·6	·1				·1			·4	·4		·1	·1	·2
<i>Rice:</i>																
U.K. ...	...	I	·2	·2	·2	·2	·1	·1	·1	·1	·1	·1	·1	·1	·1	·1
Germany ...	...	I	·5	·2	·4	·5	·3	·3	·4	·3	·3	·4	·4	·3	·3	·2
	...	E	·2	·2	·2	·2	·1	·1	·1	·1	·1	·1				
India ...	...	E	2·5	2·2	2·3	2·6	2·1	2·2	1·8	2·4	2·3	2·2	2·2	1·9	1·4	1·7
Italy ...	...	E	·1	·1	·2	·2	·2	·3	·2	·2	·2	·2	·2	·2	·2	·1
Indo-China ...	...	E		1	·9	1·1		1·5	1·6	1·3		·9	1·1	1·2	1·4	1·7
U.S. ...	...	I					·1									
	...	E		·1	·1			·1	·1	·1	·1	·1	·1	·1	·1	·1

(c) Foreign Trade in Rice.

	In 1,000 Metric Tons.								
	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.
<i>(1) Imports:</i>									
British									
Malaya	858	820	811	816	704	605	609	636	672
Ceylon	486	510	513	470	461	470	458	485	566
China ...	1,275	765	655	1,203	650	1,360	1,295	771	1,296
Manchuria							337	741	80
Formosa	122	46	84	12	2	35	7	1	
Japan ...	1,812	1,505	1,238	1,180	1,765	1,693	1,748	2,069	1,822
Dutch									
Indies	470	570	735	627	608	424	334	279	387
<i>(2) Exports</i>									
British									
Malaya	296	281	234	210	177	187	163	169	188
Formosa	407	328	316	297	412	528	544	727	615
Korea ...	877	955	788	700	1,228	1,018	1,079	1,348	1,108
Siam ...	1,540	1,320	1,006	928	1,202	1,518	1,530	1,863	

(d) Japanese Balance of Foreign Trade in Rice.

	In 1,000 Metric Tons.								
	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.
Imports ...	1,934	1,551	1,322	1,192	1,767	1,728	2,192	2,811	1,902
Exports ...	1,284	1,304	1,147	1,089	1,839	1,617	1,652	2,164	1,794
Balance ...	—650	—247	—175	—103	+72	—111	—540	—647	—118
Annual averages	—202						—594		

Note.

Total production of rice in the Japanese Empire, 1929 to 1935 ... 96·5 million metric tons.

Import surplus 25 " " "

Total consumption 99·1 " " "

Net importation in per cent. of total consumption 2½ per cent.

(3) PRICES.

	In RM. per 100 Kg.												
	Annual Averages.												
	1913.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	July, 1936.	
(a) WHEAT.													
Germany: Berlin, "märkisch"	18.81	26.81	26.71	23.40	22.78	25.64	24.88	22.95	18.71	19.61	20.74	21.94	
France: Paris, home wheat	23.18					24.51	28.42	24.23	18.18	19.61	12.97	17.94	
Great Britain: London, Plata, Rosario, spot	14.86	25.05	23.24	20.23	19.88	16.29	10.83 ³	8.57 ³	7.30 ³	6.08 ³	6.90 ³		
U.S.: New York, red winter II, spot	15.92	26.11	23.03	25.97	22.23	17.42	12.37 ¹	9.90 ¹	10.52 ¹	9.50 ¹	9.56 ¹	11.35	
Canada: Winnipeg, North Man I, spot	13.61	23.07	22.85	20.81	20.70	14.57	8.73 ²	7.56 ²	6.78 ²	6.94 ²	7.69 ⁴	8.54	
(b) WHEAT FLOUR.													
Great Britain: London, stand. ex mill						25.71	16	13.33	12.46	10.92	11.88	13.75	
(c) RYE.													
Berlin: "märk"	15.55	19	24.90	23.91	19.24	16.19	18.28	17.85	16.04	16.31	16.82	17.13	
Poland: Poznan, home, spot	15.64	13.78	19.98	19.22	13.39	9	10.89	9.80	7.66	7.21	6.27	6.27	
(d) OATS.													
Berlin: "märk."	15.97	18.46	21.60	22.63	18.42	15.25	15.60	14.75	13.29	16.44	?	?	
Buenos Aires: home	9.78	11.82	13.07	15.90	12.73	6.95	5.52	5.70	4.33	3.91	4.78	5.64 ⁴	
(e) BARLEY.													
Winnipeg: Western III, spot...	8.90	11.98	15.46	15.40	13.95	7.61	5.74	5.93	7.90	5.34	4.78	5.87	
(f) MAIZE. ⁵													
New York: mixed II, spot	?	14.37	16.30	17.35	17.72	15.78	11.12	6.82	6.41	7.14	9.43	9.91	
(g) RICE.													
Bombay: Rangoon	17.15	26.89	25.56	22.84	21.80	18.84	11.17	10.39	9.26	6.23	7.66	7.52	

See footnotes at bottom of opposite page.

(2) PRODUCTION OF SUGAR BEET.

	In Million Quintals.		
	1928-32.	1933.	1935.
Germany	112	86	106
Belgium	17	15	15
Bulgaria	2	3	2
Denmark	11	17	19
France	72	75	87
Great Britain	21	33	32
Irish Free State	1	2	5 ¹
Italy	28	1	23
Yugoslavia	8	5	5
Latvia	—	2	3
Holland	18	19	15
Austria	9	11	11
Poland	39	19	25
Rumania	7	7	6
Sweden	11	18	19
Spain	20	20	23 ¹
Czechoslovakia	56	29	37
Hungary	13	9	7
U.S.S.R.	98	90	162
Asia	?	5	2
Canada	4	4	4
U S.	74	100	72
WORLD	?	540	653 ¹

¹ 1934.

(3) PRODUCTION OF SUGAR, BY COUNTRIES.

	In Million Metric Tons of Raw Sugar.		
	1913-14.	1934-35.	1935-36.
Germany	2.2	1.7	1.7
Czechoslovakia	—	.6	.6
U.S.S.R.	1.4 ¹	1.4	2.5
France	1	1.2	.9
U.S. ²	.8	1.5	1.5
Hawaii	.6	.9	.9
Cuba	2.6	2.6	2.6
India	2.4	3.1	3.6
Java	1.4	.5	.6
Japan and Formosa	.2	1.1	1.1
TOTAL, beet sugar	9	9.8	10.3
TOTAL, cane sugar	10.1	14.7	16.1
TOTAL SUGAR	19.1	24.5	26.4

¹ Territory of Tsarist Russia.² U.S., including Hawaii and Puerto Rico : 1913-14, 1.9 ; 1934-35, 3 ; 1935-36, 3.3.

(4) TOTAL WORLD PRODUCTION.

					In Million Metric Tons of Raw Sugar.		
					Beet Sugar.	Cane Sugar.	Total Sugar.
1912/13	...	...	...	...	8.9	9.5	18.4
1913/14	...	...	...	...	9	10.1	19.1
1929/30	...	...	...	...	9.3	17.8	27.1
1930/31	...	...	...	...	11.9	16.4	28.3
1931/32	...	...	...	...	8.7	16.7	25.4
1932/33	...	...	...	...	7.9	15	22.9
1933/34	...	...	...	...	9	15	24
1934/35	...	...	...	...	9.8	14.7	24.5
1935/36	...	...	...	...	10.3	16.1	26.4

(5) INTERNATIONAL TRADE IN RAW AND REFINED SUGAR, BY COUNTRIES.

					In Million Metric Tons.			
					1929.	1932.	1934.	1935.
<i>A. Imports:</i>								
Great Britain	...	...	...	...	2.1	2.4	2	2
Japan	...	...	...	...	1	.9	.8	1
U.S.	...	...	...	...	4.4	2.6	2.7	2.7
France	...	...	...	...	.5	.4	.4	.4
India	...	...	...	...	.9	.4	.2	.2
China	...	...	...	...	.4	.4	.2	.3
<i>B. Exports:</i>								
Dutch Indies	...	...	...	...	2.4	1.5	1.1	1
Philippines	...	...	...	...	.7	1	1.2	5
Cuba	...	...	...	...	5	2.7	2.4	
Czechoslovakia	...	...	...	...	.5	.4	.2	.2
Japan and Formosa	...	...	...	...	1	1	.8	1.1

(6) TOTAL INTERNATIONAL TRADE IN SUGAR, EXPORTS.

	1929	1930	1931	1932	1933	1934
Quantities, in million metric tons ...	13	11.3	9.7	9.6	8.5	8.5
Values, in RM. million ...	3,022	2,283	1,662	1,295	1,018	858

(7) STOCKS.

Million Metric Tons.									
1927	1928	1929	1930	1931	1932	1933	1934	1935	June, 1936
4.9	5.3	6.1	7.1	8.8	9	8.7	8.2	7.4	5.8

238 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(8) NET SUGAR EXPORTS OF CERTAIN COUNTRIES.¹

			In 1,000 Metric Tons.				
			1931	1932	1933	1934	1935
Germany	...	...	341	56	-1	-13	-9
Belgium	...	...	2	-1	20	-14	10
France	...	...	-68	-127	240	248	-106
Holland	...	...	-81	-118	-55	-23	-64
Poland	...	...	345	185	114	101	107
Hungary	...	...	52	17	22	40	13

¹ Figures with negative sign = net imports.

(9) PRICES.

		In RM per 100 Kg.						
		Annual Averages.						
		1913	1930	1931	1932	1933	1934	1935
<i>Great Britain</i> , London, Java								
White, cif. India	...	22.16	18.36	15.08	11.58	10.11	7.50	7.52
								7.98
								July, 1936
<i>Czechoslovakia</i> , raw, 88°	...	18.06	11.73	9.33	7.20	7.16	5.58	5.11
								4.66
U.S., N. York, Cuba, 96°	...							
centr. excluding duty	...	20	14.07	12.41	8.61	8.89	9.35	17.87
								15.37

(10) HOME CONSUMPTION IN CERTAIN COUNTRIES.

		In 1,000 Metric Tons of Raw Sugar.									
		1913/14	1929/30	1931/32	1933/34	1934/35	1929	1930	1931	1932	1933
Germany	...	1,430	1,655	1,440	1,506	1,547					
Great Britain	...		1,813	2,102	1,920						
Italy	...		355	313							
U.S.	...		4,513	5,466							
Belgium	...						200	211	198		
France	...						942	901	968	959	965

3.—RUBBER.

(1) WORLD PRODUCTION, STOCKS AND PRICES.

	1913	1920	1925	1928	1929	1930	1931	1932	1933	1934	1935	June, 1936
World production, 1,000 tons	...	...	...	...	...	...	...	...	...	...	...	...
Stocks, 1,000 tons	...	...	...	...	...	...	...	...	...	...	...	...
Amsterdam, stand. plant, price, RM. per 100 Kg.	709			202	189	108	54	30	41	71	68	86

(2) CHANGES IN STOCKS DURING STEVENSON SCHEME.

In 1,000 Metric Tons				
1925	1926	1927	1928	1929
137	174	282	271	311

(3) PRODUCTION, IN CERTAIN COUNTRIES.

	In 1,000 Metric Tons.																
	1913	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
British Malaya ...	33	174	151	216	168	168	201	299	246	304	464	451	430	413	453	475	424
Dutch Indies	5	79	68	89	118	168	193	211	233	233	259	245	261	214	285	384	288

(3a) PRODUCTION, BY COUNTRIES.

					In 1,000 Metric Tons		
					1920	1925	1934
Africa ...	...	...	...	...	6	8	3
Mexico ...	...	...	...	...	—	4	—
South America	...	...	...	...	33	31	9
British Borneo	..	...	...	...	6	15	29
Ceylon ...	...	...	...	...	40	46	80
India ...	...	...	...	...	6	11	12
Dutch Indies	...	...	...	...	79	192	384
French Indo-China	...	...	...	...	3	8	20
British Malaya	..	..	...	...	174	213	475
Siam ...	...	...	...	...	...	5	18
Total Asia	...	...	...	...	308	490	1,018
Oceania, including Philippines	...	...	...	...	...	1	1
WORLD TOTALS	...	...	...	...	347	534	1,031
Colonial ...	...	...	...	...	...	483	992
Non-Colonial	...	...	...	...	...	51	39

(3b) PLANTATION AND WILD RUBBER, PRODUCTION.

In 1,000 Metric Tons.								
	1913	1920	1921	1922	1923	1924	1925	1935
Plantation rubber ...	51	311	274	368	342	377	466	869
Total, including wild rubber	63	36	24	28	28	30	38	18

240 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(4) INTERNATIONAL TRADE: WORLD EXPORTS OF RUBBER, GUTTAPERCHA AND BALATA.

	1929	1930	1931	1932	1933	1934	1935
Quantities, in 1,000 metric tons ...	1,139	1,058	1,005	875	1,111	1,308	1,111
Values, in RM. million ...	1,723	1,038	485	234	358	679	590

(5) NET IMPORTS, 1934.

In 1,000 Metric Tons (— = net exports).							
Germany ...	64	Japan ...	...	...	...	71	
Belgium and Luxemburg ...	15	India ...	...	...	...	—11	
France ...	58	Ceylon ...	...	...	...	—81	
Great Britain ...	160	Dutch Indies ...	...	...	...	—385	
Italy ...	22	Brazil ...	...	...	...	—12	
U.S.S.R. ...	48	Canada ...	...	...	...	29	
British Malaya ...	—472	U.S. ...	...	...	...	446	

4.—TIMBER.

(1) FOREIGN TRADE.

		In 1,000 Metric Tons.			
		1929	1932.	1933.	1934.
A. IMPORTS I. <i>Hard Wood, unsawn</i>	Germany ...	479	210	235	324
	Belgium and Luxemburg ...	275	177	192	174
	France ...	?	65	105	113
	Great Britain ...	102	50	43	63
	Holland ...	67	55	52	57
	Switzerland ...	53	50	41	55
	Czechoslovakia ...	15	45	31	40
	China ...	87	105	148	122
	Japan ...	42	—	4	9
	Canada ...	23	9	28	82
TOTALS ...		1,143	766	879	1,039
II. <i>Pit Prop Material</i>	Germany ...	285	86	28	81
	Belgium and Luxemburg ...	576	435	568	417
	France ...	165	198	239	259
	Great Britain ...	2,073	1,476	1,494	1,754
	Holland ...	145	132	180	120
	Czechoslovakia ...	132	25	1	—
	Hungary ...	114	78	65	64
TOTALS ...		3,490	2,430	2,575	2,695
III. <i>Wood for Pulp and Paper</i>	Germany ...	2,534	1,200	2,472	3,018
	Holland ...	340	84	259	323
	Sweden ...	62	42	23	19
	Czechoslovakia ...	147	56	48	49
	Canada ...	81	82	33	27
	U.S. ...	2,934	1,408	1,571	2,109
	Norway ...	—	267	139	81
TOTALS ...		6,098	3,139	4,525	5,626

		1929.	1932	1933	1934
<i>IV. Other Soft Wood, unsawn</i>	Germany ...	1,623	300	372	986
	Denmark ...	76	30	32	24
	Finland ...	158	241	253	360
	France ...	491	140	136	116
	Great Britain ...	328	327	258	312
	Italy ...	442	221	254	321
	Holland ...	361	120	195	207
	Sweden ...	138	90	93	126
	Switzerland ...	157	166	134	108
	Hungary ...	311	134	145	251
	China ...	244	207	177	140
	Manchuria ...	—	—	161	122
	Japan and Korea	934	587	512	462
	U.S. ...	443	172	213	106
	Norway ...	197	267	?	?
	Czechoslovakia ...	182	32	—	—
	TOTALS ...	6,085	3,034	2,935	3,641
<i>V. Hard Wood, sawn</i>	Germany ...	159	16	17	58
	France ...	17	29	13	9
	Great Britain ...	662	584	594	720
	Holland ...	57	39	43	47
	Austria ...	35	14	6	7
	Sweden ...	—	9	8	15
	Switzerland ...	57	51	35	38
	Czechoslovakia ...	35	27	17	15
	Hungary ...	31	6	3	10
	China ...	34	31	33	34
	Canada ...	167	41	39	47
	U.S. ...	162	29	51	39
	TOTALS ...	1,416	876	859	1,039
<i>VI. Soft Wood, sawn</i>	Germany ...	1,645	583	583	1,039
	Belgium and Luxembourg ...	1,005	669	627	554
	Denmark ...	409	257	391	481
	Finland ...	—	54	125	104
	France ...	1,285	775	726	591
	Great Britain ...	4,009	3,246	4,300	4,843
	Irish Free State	81	74	110	?
	Italy ...	1,194	835	976	931
	Holland ...	1,392	851	1,279	1,140
	Norway ...	190	97	49	67
	Spain ...	591	348	303	320
	Hungary ...	461	221	210	274
	Union of South Africa ...	224	117	182	272
	China ...	428	193	344	311
	Manchuria ...	—	—	74	94
	Japan and Korea	1,064	466	423	396
	Canada ...	172	26	22	43
	U.S. ...	2,008	484	438	345
	Commonwealth of Australia ...	459	162	245	257
	Czechoslovakia ...	139	17	4	1
	TOTALS ...	16,756	9,475	11,411	11,263

242 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

		1929	1932	1933	1934
VII. Wooden Sleepers	Germany ...	237	6	3	20
	Belgium and Luxembourg ...	93	22	53	70
	Denmark ...	31	9	4	5
	France ...	15	11	7	5
	Great Britain ...	284	171	177	233
	Holland ...	91	81	30	27
	Spain ...	114	23	13	4
	China ...	—	83	133	167
	Manchuria ...	—	—	141	173
	Canada ...	57	10	7	10
	U.S. ...	63	29	31	29
	Austria ...	41	1	—	—
	Hungary ...	60	1	—	—
	New Zealand ...	16	—	—	—
	TOTALS ...	1,102	447	499	743
B. EXPORTS <i>I. Hard Wood, unsawn</i>	Germany ...	86	93	76	57
	Yugoslavia ...	114	29	30	51
	Poland ...	197	75	92	102
	U.S.S.R. ...	95	62	33	2
	French Equatorial Africa ...	21	264	303	353
	French West Africa ...	83	38	58	61
	TOTALS ...	965	561	592	626
II. Pit Prop Material	Germany ...	373	299	304	217
	Finland ...	991	946	1,006	1,266
	France ...	868	256	173	190
	Latvia ...	384	135	135	116
	Poland ...	416	104	48	45
	Portugal ...	70	268	266	376
	U.S.S.R. ...	521	784	765	901
	Sweden ...	454	228	276	205
	Czechoslovakia ...	112	72	49	38
	TOTALS ...	4,189	3,092	3,022	3,354
III. Wood for Pulp and Paper	Finland ...	740	121	475	800
	Latvia ...	108	58	180	145
	Lithuania ...	177	75	124	134
	Austria ...	179	37	98	199
	Poland ...	1,172	152	337	352
	U.S.S.R. ...	1,477	1,304	1,693	1,798
	Czechoslovakia ...	196	428	434	520
	Canada ...	2,813	1,149	1,416	2,005
	Sweden ...	181	5	19	42
	U.S. ...	114	62	23	26
	TOTALS ...	7,157	3,391	4,799	6,021

			1929	1932	1933	1934
<i>IV. Soft Wood, unsawn</i>	Germany ...	...	287	204	172	99
	Finland ...	...	276	61	93	193
	Yugoslavia ...	...	253	85	122	129
	Austria ...	...	581	145	209	349
	Poland ...	...	396	62	150	284
	U.S.S.R. ...	...	776	664	556	476
	Sweden ...	...	300	99	141	168
	Czechoslovakia ...	...	535	210	247	608
	Brazil ...	...	104	82	84	?
	Canada ...	...	683	330	435	390
	U.S. ...	...	566	174	215	322
	France ...	...	201	44	50	54
TOTALS ...			4,958	2,160	2,474	3,072
<i>V. Hard Wood, sawn</i>	Yugoslavia ...	...	324	186	230	236
	Poland ...	...	154	74	96	116
	Rumania ...	...	104	62	67	81
	U.S.S.R. ...	...	12	79	107	187
	Canada ...	...	176	84	111	133
	U.S. ...	...	762	400	487	463
TOTALS ...			1,532	885	1,098	1,216
<i>VI. Soft Wood, sawn</i>	Esthonia ...	...	169	45	129	218
	Finland ...	...	3,165	1,881	2,491	2,719
	Yugoslavia ...	...	722	272	356	414
	Latvia ...	...	306	213	369	386
	Austria ...	...	1,044	549	574	576
	Poland ...	...	830	441	789	785
	Rumania ...	...	1,007	518	436	601
	U.S.S.R. ...	...	2,301	2,600	2,799	2,816
	Sweden ...	...	2,579	1,617	1,892	1,969
	Czechoslovakia ...	...	256	118	109	238
	Canada ...	...	2,598	1,039	1,511	1,986
	U.S. ...	...	3,507	1,182	1,294	1,386
	Norway ...	...	132	72	48	45
	Australia ...	...	114	58	34	30
TOTALS ...			18,820	10,578	12,831	14,169
<i>VII. Wooden Sleepers</i>	Yugoslavia ...	...	—	17	12	43
	Poland ...	...	219	54	77	157
	U.S.S.R. ...	...	177	171	167	86
	U.S. ...	...	362	76	137	222
TOTALS ...			758	318	393	508

6.—OIL SEEDS, ARRANGED ALPHABETICALLY.

(1) COPRA.

(a) *Production, by Countries.*

	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
	In 1,000 Metric Tons.													
Africa	35	38	42	49	50	47	50	51	54	54	57	61	64	
British Col. Africa	20				28			26			28		27	
French Africa ...	1				2			4			3		4	
Colonial Africa ...	35				50			51			57		64	
British Central America ¹	6	10	8	8	14	12	19	20	18	15	13	15	11	
Asia	968	886	929	958	1,067	1,013	1,248	1,304	1,092	1,104	1,083	1,370	1,363	1,330
British Colonial Asia	230				299			311			257		367	
French Asia ...	7				12			13			5		5	
Oceania	140	144	147	158	169	171	203	205	201	179	172	183	178	
British Colonial Oceania	44				69			87			54		38	
French Oceania ...	24				14			31			21		30	
WORLD	1,150	1,079	1,126	1,175	1,300	1,243	1,519	1,579	1,365	1,352	1,324	1,629	1,646	1,580
Colonial ²	1,127				1,300			1,579			1,005		1,044	
Non-Colonial ...	23				—			—			319		572	

¹ Including British Guiana. ² The Philippines counted as colonial prior to 1930.(b) *Prices.*

	In Gold Francs per 100 Kg., end of year												
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
London, Ceylon copra ...	73.78	71.80	78.35	69.02	72.43	64.99	60.02	41.99	29.31	27.57	17.24	17.28	20.89 ¹

¹ June.

(2) COTTON SEED.

(a) Production.

	In 1,000 Metric Tons													
	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	
<i>Africa ...</i>	726	853	961	906	745	996	998	977	827	724	1,070	1,031	1,120	
<i>Non-Colonial Africa ...</i>	611	677	745	711	565	745	790	762	583	455	784	692	760	
<i>North America</i>	4,084	5,489	6,486	7,247	5,224	5,838	5,978	5,616	6,896	5,245	5,264	3,885	4,380	
<i>Central America</i>	102	117	119	198	104	155	123	91	106	57	120	105	110	
<i>Colonial Central America</i>	2	2	2	4	3	3	4	6	3	1	1	2		
<i>South America ...</i>	390	406	430	399	434	403	513	426	479	410	725	1,014	1,170	
<i>Asia¹ ...</i>	3,420	4,036	4,261	3,482	4,062	4,365	3,976	4,301	3,629	4,098	4,508	4,741	4,960	
<i>Colonial Asia ...</i>	66	69	73	76	78	84	85	91	66	75	80	82	105	
<i>Europe ...</i>	9	11	12	62	38	69	64	52	57	31	82	104	150	
<i>Oceania ...</i>	6	8	5	4	6	4	7	6	8	6	9	7		
<i>Colonial Oceania</i>	1	1	2	1	1	1	1	1	1					
<i>World ...</i>	8,740	10,920	12,274	12,300	10,610	11,820	11,660	11,470	11,950	14,560	11,720	10,820	11,900	
<i>Colonial ...</i>	184	248	293				298			345	367	423	467	
<i>Non-Colonial ...</i>	8,556	10,672	11,981				11,362			10,215	11,253	10,397	11,433	

¹Including U.S.S.R. in Asia.

(b) Prices.

In Gold Francs per 100 Kg ; end of Year.									
	1927	1928	1929	1930	1931	1932	1933	1934	1935
London, Sakellaridis	28.63	23.65	19.93	14.07	10.11	12.22	6.72	9.06	9.64

(3) GROUND NUTS (PEA-NUTS).

(a) Production.

Countries.	In 1,000 Metric Tons							
	1922	1925	1928	1929	1932	1933	1934	1935
Africa	610	917	1,140	1,270	1,260	1,390	1,380	
Colonial Africa ...	595			1,248	1,230		1,358	
U.S.	287	317	388	434	471	411	482	573
Mexico	9	8	8	6	5	5	7	
South America ...	51	79	57	74	90	115	100	
Asia	1,797	2,753	3,550	3,110	4,050	4,130	2,720	2,900
Colonial Asia ¹ ...	310			550	792		493	
Spain	21	22	27	26	20	21	21	
Australia... ..			3	4	1	2		
WORLD	2,770	4,090	5,170	4,920	5,900	6,070	4,710	
Colonial ¹	905			1,798	2,022		1,851	
Non-Colonial ...	1,865			3,122	3,878		2,859	

¹ After 1925, including Manchuria, after 1930 excluding the Philippines.

(b) Prices.

In Gold Francs per 100 Kg , End of Years.										
	1923	1925	1928	1929	1930	1931	1932	1933	1934	1935
London, Coromandel, shelled	56.58	53.66	49.75	44.67	26.99	22.72	22.12	15.40	17.47	20.46

(4) HEMP-SEED.

(a) Production.

Countries.	In 1,000 metric tons.							
	1921	1925	1928	1929	1932	1933	1934	
Europe	266	600	603	464	329	269	325	
U.S.S.R.	218	550	560	410	280	219	277	
WORLD	268	604	605	465	329	270	325	

Without China, which is a very important producer ; no reliable statistics exist.

248 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(b) Prices.

	In Gold Francs per 100 Kg., End of Years.									
	1923	1925	1928	1929	1930	1931	1932	1933	1934	1935
London, Manchurian ...	36.75	50.87	37.22	28.54	20.20	17.52	15.65	13.32	10.80	17.07

(5) LINSEED.

(a) Production.

Countries.	In 1,000 Metric Tons.							
	1921	1925	1928	1929	1932	1933	1934	1935
Africa ...	16	25	15	13	13	8	15	12
North America	308	728	579	457	367	194	159	420
Mexico ...		1	1	1	4	2	2	
South America ...	929	9,160	2,044	1,353	1,614	1,665	2,110	1,367
Asia ...	292	521	357	331	427	430	416	470
Europe ...	378	791	777	964	906	868	845	
U.S.S.R. ...	347	576	600	710	800	740	690	
Oceania ...	3	2	1	5		8	1	
WORLD ...			3,770	3,120	3,330	3,170	3,550	

(b) Prices.

	In Gold Francs per 100 Kg., End of Years.							
	1922	1925	1928	1929	1932	1933	1934	1935
Buenos Aires, 4% extraneous matter...	35.26	36.39	33.65	42.19	11.97	13.24	12.10	12.40

(6) OLIVE OIL, PRODUCTION.

Annual Average				In 1,000 Quintals.			
				1909-13	1920	1930	1933
Colonial Africa	...	..	...	604	868	535	786
U.S.	...	...	...	1	1	10	?
Colonial Asia	...	...	...	200	422	370	166
Europe	...	...	...	5,023	6,712	3,620	6,830
WORLD	...	...	...	5,830	8,005	4,540	7,790
Colonial	...	...	...	804	1,290	905	952
Non-Colonial	...	...	...	5,826	6,715	3,635	6,838

(7) PALM OIL AND PALM-KERNEL OIL, RAW, NET EXPORTATION.

				Annual Average. 1909-13	In 1,000 Quintals.		
					1921	1930	1933
Liberia ...	...	...	...	—	5	?	56
Colonial Africa ...	...	...	...	2,651	2,155	4,628	4,434
Brazil ...	...	...	...	2	35	55	3
Dutch Indies ...	...	...	...	—	—	537	1,267
WORLD ...	...	...	...	2,653	2,195	5,220	5,760
Colonial ...	...	...	...	2,651	2,155	5,165	5,701
Non-Colonial ...	...	...	...	2	40	55	59

(8) RAPE SEED.

(a) *Production.*

	In 1,000 Metric Tons.							
	1921.	1925.	1928.	1929.	1932.	1933.	1934.	1935.
Asia ¹	970	1,309		925	1,133	1,151	1,066	1,031
Europe ¹	208	174		160	138	92	137	230
WORLD ¹	1,178	1,483		1,085	1,219	1,243	1,204	1,260

¹ Without: China, U.S.S.R. and from 1921 to 1925 Germany; i.e., without nearly all important producers.

(b) *Prices.*

	In Gold Francs per 100 Kg.; End of Years.									
	1922.	1925.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.
Hull:										
Toria	39·81	51·18	47	45·91	26·79	21·16	20·18	15·57	17·59	19·67

(9) SESAMUM.

(a) *Production.*

	In 1,000 Metric Tons.							
	1922.	1925.	1928.	1929.	1932.	1933.	1934.	1935.
Africa	40	40	51	67	67	57	67	
French Africa	3	3		5	5	7		
British Colonial Africa ¹	5	31		42	46	36		
Italian Africa	?	2		2	—	?		
All Colonial Africa	40	35		63	62	51		
Mexico	5	10	15	11	16	13	14	
Asia	582	476	582	574	614	619	513	600
British Colonial Asia	4	3		5	1	—	3	
Japan and Colonies ²	9	8		8	14	30	45	
All Colonial Asia	11	11		19	17	31		
Europe		13	41	55	46	46	46	
WORLD	640	539	689	707	743	734	640	720
Colonial	51	46		82	79	82		
Non-Colonial	589	493		625	664	652		

Note—Chinese production large but size unknown; in some important colonial countries only exports are recorded; these and Chinese exports are included in the table

¹ Including the Anglo-Egyptian Sudan. ² Including Manchuria.

(b) *Prices.*

	In Gold Francs per 100 Kg.; End of Years.								
	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.
London:									
Chinese	60·89	55·64	45·40	33·11	24·01	24·69	18·38	20·89	22·56

250 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(10) SOYA BEANS.

(a) Production.

	In 1,000 Metric Tons.							
	1922.	1925.	1928.	1929.	1932.	1933.	1934.	1935.
Japanese Empire ¹	185	133	5,735	5,754	5,148	6,160	4,122	
WORLD	1,617	5,533	6,117 ²	6,100	5,193	6,787	4,880	

¹ Including Manchuria after 1925. ² Changed statistical method.

(b) Prices.

	In Gold Francs per 100 Kg ; end of Years.									
	1923.	1925	1928	1929	1930	1931.	1932	1933.	1934.	1935.
Hull, Manchurian ...	30.62	31.33	29	25.41	17.06	12.76	12.14	9.79	9.53	11.12

(11) WHALE OIL, PRODUCTION.

	1920- 21.	1925- 26	1928- 29	1929- 30.	1930- 31.	1931- 32.	1932- 33.	1933- 34.	1934- 35.
No. of whales caught ...	12,174	28,193	27,896	37,674	42,874	12,797	28,668	32,167	39,056
Production of oil, in 1,000 tons	79.8	195.2	319.4	474	624.3	155.1	439.7	435.7	454.5

7.—COTTON.

(1) PRODUCTION (EXCLUDING LINTERS AND SEED).

Type of Cotton.	(a) In Million Quintals.			(b) Percentages of World Harvest.		
	1913-14.	1920-21.	1926-27	1913-14.	1920-21.	1926-27
American	33.6	31.6	43.4	59	58	65
Indian	9.3	9.5	9.1	16	17	14
Egyptian	3.4	2.7	3.9	6	5	6
ALL SORTS	56.8	54.5	66.5	Others . . . 19	20	15
Country of Production.	1927-31.	1934.	1935.	1927-31.	1934.	1935.
U.S.	31.8	20.9	23.1	56	42	43
India	9.5	8.7	10.4	17	17	19
Egypt	3.4	3.5	3.8	6	7	7
WORLD	56.6	50	53.5	U.S.S.R. 5	8	16
				Others ... 16	26 ¹	15 ²

¹ Brazil, 3. ² Brazil, 4.

(2) EXPORTS.

(a) Exports from Certain Countries; Raw Cotton, including Linters.

				In 1,000 Metric Tons.					
				1913.	1925.	1929	1932.	1934.	1935.
Egypt	...	...	...	313	289	343	301	385	384
India	...	...	...	530	757	713	291	621	571
U.S.	...	...	...	2,069	1,989	1,806	2,179	1,428	1,467
Proportion of Indian to U S. cotton	...	...	...	1 : 3.9	1 : 2.6	1 : 2.5	1 : 7.5	1 : 2.3	1 : 2.6

(b) Whole Volume of World Exports of Raw Cotton.

	Unit	1929	1930.	1931.	1932.	1933.	1934.	1935.
Quantities	1,000 tons	3,333	3,040	3,015	3,157	3,278	2,999	3,079
Values ...	RM. million	5,908	3,994	2,581	2,158	2,182	1,958	2,025

(3) CONSUMPTION.

(a) In Million Bales.

[One bale=230 Kg. for American; 180 Kg for Indian; 340 Kg. for Egyptian; 135 Kg. for other cotton.]

	U.S.-American.			Indian.		Egyptian				All Types.		
	1913	1930.	1934	1913	1930	1934	1913	1930.	1934	1913	1930	1934.
Germany ...	1.3	.9	1.1	2	.3	.2	.1	.08	.1	1.7	1.3	1.5
Belgium ...	.2	.2	.1	1	.2	.1				.3	.5	.3
France ...	.8	.7	.7	.1	.2	.2	.1	1	.2	1	1.2	1.1
U K. ...	3.7	1.5	1.5	.05	.2	.2	.4	.3	.4	4.3	2.5	2.5
Italy ...	.6	.7	.6	.2	.3	.1		.05	.08	8	1.1	.9
U S.S.R. ...	.5	.03	.06	.02	.2	.03	.1	.05		2.5	2.1	1.9
Spain ...	.3	.3	.3	.03	.1	.06		.03	.05	.4	.4	.4
Czechoslovakia ...	?	.3	.2	—	1	.03		.02	.05	?	.5	.3
Europe ...	8.4	5.5	5.4	.9	1.6	1.1	.8	.7	.9	12.6	10.4	9.9
China ...	?	.3	.3	?	.5	.2				?	2.3	2.4
India ...	.1	.04	.04	2.1	2.2	2.2				2.2	2.4	2.5
Japan ...	.4	1.1	1.8	1	1.7	1.2				1.6	3	3.3
Asia ...	.5	1.4	2.2	3.1	4.4	3.6		.06	.1	3.8	7.7	8.1
U.S. ...	5.5	5.8	5.6	.1	.06		1	.1		5.8	6.1	5.7
Brazil ...				.1						.5	.4	.5
America ...	5.7	6	5.8	.2	.06		.1	.1	.08	6.6	6.9	6.6
WORLD ...	14.6	13	13.5	4.2	6.1	4.8	.9	.9	1.1	23	25.2	25.1

252 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(b) In 1,000 Metric Tons.

	U.S.-American.		Indian.		Egyptian.		Totals.	
	1913.	1934.	1913.	1934.	1913.	1934.	1913.	1934.
Germany ...	299	253	36	36	34	34	379	341
Russia ...	115	14	4	5	34	—	411	227
Great Britain	851	345	9	36	136	136	1,020	572
Asia ...	115	506	558	648	—	34	694	1,479
U.S. ...	1,265	1,288	18	11	34	—	1,321	1,303
WORLD ...	3,358	3,075	756	864	306	374	4,856	5,082

(4) STOCKS.

	In 1,000 Metric Tons.											
	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936. ¹
All types ...	1,039	1,276	1,527	1,313	1,314	1,646	1,966	2,087	2,070	1,822	1,411	1,230
American only	740	955	1,188	909	880	1,124	1,470	1,688	1,671	1,332	1,036	812

¹ End of June

(5) COTTON SPINDLES IN SOME IMPORTANT COUNTRIES AND IN THE WORLD.

				In Millions of Spindles ; July 31st					
				1913	1925	1929.	1932.	1934.	1935
Germany ...	...	...	...	11.2	9.5	11.3	10.2	10.1	10.1
France ...	...	...	...	7.4	9.4	9.9	10.1	10.2	10.2
U.K. ...	...	...	...	55.7	57.1	55.9	51.9	45.9	42.7
Italy ...	...	...	...	4.6	4.8	5.2	5.4	5.5	5.5
Austria ...	...	...	...	7.9 ¹	1	1	.8	.8	.8
Russia ...	...	...	...	7.7 ²	7.2	7.5	9.2	9.8	9.8
Spain ...	...	...	...	2	1.8	1.9	2.1	2.1	2.1
Czechoslovakia ...	...	...	...	—	3.5	3.7	3.6	3.6	3.6
Belgium ...	...	...	...	1.5	1.9	2.2	2.2	2.1	2.1
Europe ...	...	...	...	99.5	101.1	104.3	101.4	96.2	92.9
China ...	...	...	...	?	3.4	3.6	4.3	4.7	4.8
India ...	...	...	...	6.1	8.5	8.7	9.3	9.6	9.6
Japan ...	...	...	...	2.3	5.3	6.3	7.8	9.1	9.9
Asia ...	...	...	...	8.4 ³	17.1	18.8	21.4	23.4	24.4
Brazil ...	...	...	...	1.2	2	2.8	2.7	2.7	2.7
U.S. ...	...	...	...	32.1	37.9	34.8	31.7	30.9	30.1
America ...	...	...	...	34.9	42	39.6	36.5	35.7	34.8
WORLD ...	...	...	...	143.5	161.4	164.2	161	156.9	153.8

¹ Including Czechoslovakia. ² Excluding Poland and Finland. ³ Excluding China

(5a) COTTON LOOMS, EXCLUDING THOSE DRIVEN BY HAND.

In Thousands.							
Countries.	1913.	1920.	1933.	Countries.	1913.	1930	1933.
Germany ...	230	224	223	Czechoslovakia	—	125	105
Belgium ...	24	54	55	India ...	94	180	190
France ...	108	200	198	Japan ...	21	188	277
U.K. ...	805	693	588	U.S. ...	696	699	614
Italy ...	140	147	147	Brazil ...	50	78	82
Holland... ..	40	55	56				
Austria	170 ¹	14	13	Europe ...	1,875	1,914	1,847
Hungary		12	13	Asia ...	121	401	515
U.S.S.R. ...	213	159	250	America ...	804	842	766
Spain ...	55	81	67				
				WORLD	2,807	3,159	3,130

Austro-Hungarian Monarchy.

(6) PRICES.

	In RM. per 100 Kg.								
	1913.	1929.	1930.	1931	1932.	1933.	1934.	1935.	July, 1936.
Egypt, Alexandria, Sakellaridis, futures	175.76	311.31	223	126.85	91.02	86.15	89.89	84	101.21
India, Bombay, Oomra I	85.03	127.57	80.79	65.19	60.52	52.59	51	55.34	54.92 ¹
U.S., New York, middling upland, spot	118.76	177.13	125.74	79.26	59.63	62.41	68.14	65.37	71.94
Cotton yarn, U.K., Manchester, 32' ...	?	?	220	157	122	117	119	115.03	126.29

¹ June.

(7) RUSSIA: PRESENT TERRITORY OF THE U.S.S.R. IN EUROPE AND ASIA

	Unit.	1913.	1920.	1929.	1930.	1931.	1932.	1933.	1934.
Production of cotton ...	1,000 tons	740	10	860	1,110	1,290	1,270	1,315	1,320
Production of cotton piece goods ...	million metres	1,625	8	3,183	2,515	2,541	2,690	2,701	2,711
Imports of raw cotton ...	1,000 tons	196.9	—	115	57.9	53.7	24.3	22.5	22.6
Exports of raw cotton ...	" "	?	?	2.5	10.1	40.2	17.9	.6	11
Exports of cotton piece goods ...	" "	17.2	—	3.2	13.4	15.9	18.8	15.3	20.8

254 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(8) PRODUCTION OF GINNED COTTON, ANNUAL AVERAGE, 1925-1929.

In 1,000 Q.						
French Africa	96	Total, Central and		U.S.S.R.		2,158
Belgian Congo	57	South America ...	2,551	Europe		267
Egypt	3,442			Australia		16
Portuguese Africa ...	25	China ¹	4,465			
British colonial Africa ...	403	India	10,243	WORLD		57,700
Italian Africa	9	Iran	6			
Anglo-Egyptian Sudan...	272	Iran	175	Colonial		921
Union of South Africa ...	25	Siam	7	Non-colonial ² ...		56,779
Total, Africa	4,330	Dutch Asia	10			
		Br colonial Asia ...	5			
U.S.	33,104	Korea	298			
British West Indies ...	8	French Asia	3			
Non-colonial Central		Total, Asia	15,245			
and South America	2,543					

¹ Very incomplete. ² Proportion, 1934 : colonial, 1,100 ; non-colonial, 48,900 (roughly).

8.—MINOR TEXTILE FIBRES.

A — Flax.

(1) PRODUCTION.

In 1,000 Quintals							
	Annual Average 1925-29	1934.	1935		Annual Average 1925-29	1934	1935
Egypt	10	14		Rest of Europe	2,260	1,480	
Asia	37	24 ¹					
U.S.S.R.	2,980	5,300	5,500	WORLD	5,290	6,800	9,691

¹ 1933.

(2) QUANTITY IN INTERNATIONAL TRADE.

In 1,000 Metric Tons.						
1929	1930.	1931	1932.	1933	1934.	1935.
406	316	265	272	246	280	305

(3) PRICES.

In RM. per 100 Kg.								
	1913.	1930.	1931.	1932.	1933.	1934.	1935.	July, 1936
Great Britain, London, Riga flax, spot ...	66.72	103.29	65.78	65.63	70.12	75.16	94.78	67.59

B.—Hemp.

(1) PRODUCTION IN CERTAIN COUNTRIES.

	In 1,000 Quintals. Annual Averages			
	1925-29. ¹	1929-33. ²	1934. ³	1935. ³
Chile	23			
Japanese Asia	293	280	258	
Philippines	1,855			
Total, Asia	2,166			
U.S.S.R.	3,189	2,278	1,565	
Rest of Europe	1,950	1,456	2,960	1,453
WORLD	8,180	4,148	3,415	

¹ Including manilla hemp. ² Excluding manilla hemp.

(2) INTERNATIONAL TRADE : EXPORTS OF EUROPEAN HEMP.

In 1,000 Metric Tons.				
1929	1932.	1933.	1934	1935.
127	69	78	85	90

(3) PRICES.

	In RM per 100 Kg , Annual Averages						July, 1936.
	1913.	1931	1932	1933.	1934.	1935	
London, Man. J.2, futures	62·82	35·04	26·99	21·75	18·38	23·59	34·47

C—Silk

(1) PRODUCTION OF COCOONS.

	In 1,000 Metric Tons						
	1929.	1930	1931	1932	1933	1934	1935.
Japan and Korea	398	417	382	355	401	350	329
China ¹	121	92	82	47	54	38	
France	2·5	1·8	1	1	·9	1	·7
Italy	53	53	34	38	35	29	18
Greece	2·5	1·9	1·7	1·9	2·2	2·6	
Turkey	1·8	1·6	1·4	1·2	1·9	1·9	
Bulgaria	2·4	2·3	1·1	1·3	1·4	·3	1·2
Yugoslavia	1·3	1·3	·8	·5	·7	·4	
Syria and Lebanon	3·5	3·7	2·8	1·7	1·8	1·2	·7
U.S.S.R.	15	19	20	10	14	15	18

¹ Exports.

256 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(2) PRODUCTION OF RAW SILK.

In 1,000 Tons.											
Countries.	1929.	1932.	1933.	1934.	1935.	Countries.	1929.	1932.	1933.	1934.	1935.
Korea and Japan	43.4	42.8	42.8	47	41	Rest of Europe	5.8	4.5	4.1	3.8	2.4
China ¹ ...	10.2	4.2	4.6	3.5	4.6	WORLD ...	61.4	52.6	54.2	56	49.9
Total, Asia ...	54.3	47.3	48.7	50.8	45.9						
U.S.S.R. ...	1.3	.9	1.2	.8	1.5						

¹ Exports.

(3) STOCKS AND PRICES.

	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.
Stocks, in 1,000 tons ...	7	7.1	8.1	8	9.1	13.7	15.2	15.2	15.7	16.9	13.3	11.2 ³
Prices ; Great Britain, London, Japanese silk ; RM. per 100 Kg. ¹						34.97	23.83	15	12.25	7.88	9.57	9.73 ²

¹ 1913 : 36.03. ² June. ³ April.

(4) INTERNATIONAL TRADE, EXPORTS.¹

	Unit	1929.	1930.	1931.	1932.	1933.	1934.	1935.
Values ...	RM. million ...	2,327	1,391	1,068	602	467	260	366
Quantities	1,000 metric tons	56	47	52	44	43	41	45

¹ Excluding silk waste.

D — Jute.

(1) PRODUCTION.

		In 1,000 Quintals.					
		1913	1920.	Annual Av. range 1925-29	1929	1933.	1934.
Japanese Empire	...			48			
French Indo-China	...			4			
India ...	...	16,140	10,730	18,688	18,750	14,490	15,480
Nepal ...	...			113			
WORLD ...	...			18,853			

(2) EXPORTS FROM INDIA.

	Unit.	1913	1920.	1929	1932	1933	1934.
Raw jute ...	1,000 tons ...	781	480	820	572	760	765
Jute piece goods ...	Million metres	970	1,237	1,509	925	962	972
Jute bags ...	Million	369	534	522	415	402	423

(3) EXPORTS IN INTERNATIONAL TRADE, ALL COUNTRIES.

		In 1,000 Tons.						
		1929.	1930.	1931.	1932.	1933	1934.	1935.
Raw jute	...	886	649	692	519	755	750	824

(4) PRICES.

	In RM per 100 Kg							
	1913.	1930.	1931.	1932	1933.	1934.	1935	July, 1935.
Great Britain, London, nat. I, futures ...	61.17	42.39	32.09	24.40	21.13	19.23	22.17	20.43

9.—WOOL.

(1) PRODUCTION.

		In 1,000 Metric Tons.						
		1928	1930.	1931.	1932.	1933.	1934.	1935.
Germany	...	15.3	14.7	14.7	14.3	14.2	14.6	16.5
France	...	21.4	26.1	25.4	24.6	24.4	24.3	24.3
Great Britain	...	51.7	50.3	51.3	54	54.4	51.7	49.9
Italy	...	14.5	21.8	20	19.1	18.6	16.3	
Yugoslavia	...	12.3	12.3	12.6	13.4	13.5	13.7	12.5
Rumania	...	25.6	23.8	21.7	25.2	25	26	29.6
Spain	...	38.1	36.3	34.9	35.4	35.4	33.1	29.9
Turkey	...	19.2	16.7	18.9	18.7	17.6	17.1	19.7
U S S R.	...	177.8	137	98.9	64.9	61.7	64	75.8
Europe	...	427.2	388.1	352.7	310.1	318.1	314	328.8
China ¹	...	41.1	25.7	29.5	13.5	27.8	41	55
India	...	45.4	45.4	45.4	45.5	45.4	45.4	45.4
Iran	...	22.2	20.4	22.2	22.2	22.2	22.2	22.2
Asia	...	130.6	112.9	118.2	100.5	113.6	127.8	143
French Morocco	...	12.7	12.7	10.5	12	12.2	12.8	15
Union of South Africa	...	131.6	137	142.4	149.7	128.8	100.7	113.4
Africa	...	175.2	187.3	180.5	105.5	175.2	146.3	
U S	...	174.1	197.1	210.7	199.8	208.6	204	204.6
Argentina	...	157.4	163.7	171.4	176	174.6	170.6	163.3
Brazil	...	15.2	15.7	15.9	15.3	16	16.5	
Chile	...	15.4	12.1	12.9	15.3	12.7	12.7	
Uruguay	...	62.6	75.3	47.2	50.8	43.1	53.1	47.6
America	...	448.3	491	482	481.1	478.3	480.4	468.1
Australia	...	439.2	536.7	584.9	612.4	583.1	587.8	554.3
New Zealand	...	123.4						
WORLD	...	1,744.4	1,716	1,718.3	1,709.6	1,668.3	1,656.3	1,656
Colonial...	...					78.6		
Non-colonial	...					1,589.7		

¹ Exports

258 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(2) STOCKS.

	In 1,000 Tons.							
	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.
Raw wool	?	?	?	?	?	189	223	199
Tops ...	23.1	25.5	21.4	22.3	25.8	30.7	28	21 ¹
								135

¹ October. ² June.

(3) PRICES.

	RM. per 100 Kg.						
	1913.	1930.	1931.	1932.	1933.	1934.	July, 1936.
France, Le Havre, Buenos Aires fine, futures ...	157.95	139.22	96.89	76.41	87.43	89.93	85.09
							91.30

(3a) WORLD PRODUCTION, 1909-1935.

Annual Average 1909-13.	In 1,000 Metric Tons.						
	1922.	1923.	1924.	1925.	1928.	1933.	1935.
1,463	1,214	1,236	1,296	1,329	1,744	1,669	1,656

(4) WORLD EXPORTS.

	1929.	1930.	1931.	1932.	1933.	1934.	1935.
<i>Quantities, in 1,000 tons</i>							
Raw wool ...	1,004	918	946	961	1,114	904	1,015
Tops ...	55	52	56	55	63	53	60
<i>Values, in RM. million</i>							
Raw wool ...	2,905	1,657	1,190	884	998	1,174	938
Tops ...	368	255	197	155	177	162	160

(5) EXPORTS, BY COUNTRIES.

In 1,000 Metric Tons.								
	1931.	1934.	1935.			1931.	1934.	1935.
Great Britain ...	16	25	36	Chile ...		10	11	10
Union of S. Africa...	107	87	118	Uruguay ...		66	24	50
India ...	18	18	23	Australia ...		369	367	386
China ...	15	15	20	New Zealand ...		96	103	101
Argentina ...	141	113	136					

(6) PRODUCTION OF WOOLLEN GOODS.

	Year.	Woollen Yarns, in 1,000 tons.	Woollen Cloth, in 1,000 tons.	Id., in million metres.
Germany ...	1927 1928 1933	61·2 61·7 64		
France ...	1913 1926/27	88 106·7	55 73·6	
Poland ...	1930 1933	23·2 23·6	8·6 6·6	
Sweden ...	1930 1933	10·2 10·8	8·4 8·2	
Great Britain ...	1907 1912 1924 1930	202·3 256·3 251·5 175·1		416 440 398 ¹ 288 ¹
U.S. ...	1925 1927 1929		151·6 145 143·4	
U.S.S.R. ...	1931 1934	73·3		122·6 88·2
Japan ³ ...	1929 1930 1931 1932	29·2 25 35·2 38·5		205·6 198·8 215·2 ?
Australia ...	1929/30 1932/33	3·5 4·6		14·5 ² 28·1 ²

¹ Qm ² Excluding rugs, carpets and shawls ³ Rugs, million: 1929, 9; 1930, 9; 1931, 1·2.

10.—ARTIFICIAL SILK (RAYON).

(1) WORLD PRODUCTION.

In Million Lbs.									
1892.	1902.	1912.	1919.	1921.	1929.	1932.	1933.	1934.	* 1935.
·031	5	20	40	65·5	442·4	489·4	670·7	795·4	1,017·6

(2) PRODUCTION BY COUNTRIES.

	In 1,000 Metric Tons.						
	1929.	1930.	1931.	1932.	1933.	1934.	1935.
France	16.8	18.1	20	23	25.5	32.1	32
Germany	26.5	26.8	28.1	28.2	32.8	41.6	62
Great Britain ...	25.8	22.1	24.8	32.9	38.1	42.2	49.1
Italy	32.3	30.1	34.6	32.1	37.2	48.3	
Japan	12.2	16.6	22.3	31.6	44.7	69.2	98.6
U.S.	55.3	49.9	65.5	61.2	94.6	95.4	116.4
WORLD	198.9	192.6	224.6	240.2	349.7	413.8	462

(3) PRICES.

	In RM. per Kg							
	1913	1930	1931.	1932.	1933.	1934	1935.	July, 1936.
Germany, Krefeld, 120 den. Schuss	12.50	6.74	5.15	5.08	5	5	5	4.85

(4) EXPORTS OF RAYON AND RAYON YARNS.

(a) World Exports.

In 1,000 Metric Tons.						
1929.	1930.	1931.	1932.	1933.	1934.	1935
61	63	66	64	69	89	88

(b) By Countries.

	In 1,000 Metric Tons.				
	1931.	1932.	1933.	1934.	1935.
Germany	8.5	9.1	9.6	7.4	6.4
Belgium and Luxembourg	2.8	2.5	2.7	3.5	3
France	8.5	8.3	10.4	12.5	8.3
Great Britain	4.1	6.8	7.3	8.1	8.3
Italy	22.5	18.7	19.1	30.1	24.8 ¹
Holland	10.1	8.4	8.3	8.1	7.6
Switzerland	4.6	3.7	4.7	4.5	3.5
U.S.		.3	.5	1.1	1
Japan		3.3	4	10	13.6

¹ January-September.

D.—ELECTRICAL ENERGY

(1) PRODUCTION.

	In Million Kwh.		
	1925.	Last Year for which Figures Available.	Figure
Algeria	59	1933	174
Morocco	?	1934	141
Union of South Africa ...	1,761	1934	3,309
Canada	10,110	1935	23,404
U.S.	90,300 ¹	1935	99,384
Newfoundland	?	1930	795
Mexico H.	1,262 ¹	1935	2,064
Argentina T.	?	1933	1,630
Chile	214	1934	356
Uruguay	84	1932	158
French Indo-China	?	1934	56
Japan	8,172	1934	19,108
Dutch Indies H.	?	1933	231
British Malaya T.	57	1934	228
Philippines	65	1934	115
U.S.S.R.	2,925	1935	25,900
Germany	20,328	1934	30,727
Belgium T.	2,274	1935	4,875
Bulgaria	32	1934	137
Denmark T.	380	1933	751
Spain H.	1,611	1935	3,270
Estonia T.	—	1933	39
Finland	541	1935	2,000
France	10,222	1935	15,600
Greece T.	?	1932	140
Hungary T.	441	1933	729
Irish Free State H.	?	1933	185
Italy	6,545	1935	13,118
Latvia T.	?	1933	100
Norway H.	?	1934	7,143
Holland	1,004	1935	2,207
Poland T.	1,668	1935	2,810
Portugal	?	1933	250
Austria	2,140	1934	2,465
Rumania	243	1933	594
U.K.	11,278	1935	18,944 ²
Saar Territory T.	504	1935	990
Sweden H.	3,673	1935	6,900
Switzerland H.	3,665	1935	5,692
Czechoslovakia T.	1,955	1935	2,970
Turkey T ²	?	1933	89
Yugoslavia	?	1931	392
Australia	1,537	1934	2,910
New Zealand H.	340	1934	916

¹ 1926. ² Only Istanbul. ³ Only public works.
H—only hydro-electric power. T—only thermal-electric power.

262 INTERNATIONAL DISTRIBUTION OF RAW MATERIALS

(2) DEVELOPED WATER-POWER OF THE WORLD, JAN. 1ST, 1932.¹

In 1,000 H.P.					
Canada	6,125	France	2,300		
U.S. (incl. Alaska) ...	14,921	Germany	2,000		
North and Central America	21,800	Italy	4,840		
Brazil	640	Norway	1,000		
Total South America ...	900	Spain	1,000		
		Sweden	1,675		
		Switzerland	2,300		
America	22,700				
Japan	3,500	Europe	18,400		
Asia	4,000	WORLD	46,000		
Africa	33				
Oceania	370				

¹ From *The World Almanac*, 1933.

E.—TABLE OF MARKS OF INTERNATIONAL WEALTH

(A) UNWEIGHTED MARKS

No. of Country.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	Iron Ore	Iron.	Steel	Bauxite	Chromium Ore.	Copper Ore.	Gold Stocks in Central Banks	Gold Production	Silver.	Lead Ores.	Manganese Ore.	Nickel Ore	Quicksilver.	Tin Ore.	Zinc Ore.	Platinum.	Palladium	Osmium and Iridium	Other Platinum Metals.	Antimony Ore.	Cadmium
1 Australia									1	2					1						1
2 Brazil ...																					
3 Canada ...						1		1	1			9			1	1	9		8		
4 China ...																				7	
5 France ...	4	1	1	4	1	2						1									1
6 Germany	2	1													1						
7 G. Britain	1	1	1	1	2	1	1				1			4							
8 Holland ...				1										2							
9 India ...					1					1	1										
10 Italy ...				1								2									
11 Japan ...					1																
12 Poland ...																					1
13 Russia ...	2	2	1		2			1			6	1				3					
14 Union of S.																					
Africa ...					1			4										7			
15 U.S. ...	3	3	3	1		2	5	1	1	2	1				3	2		2	2		6

B.—WEIGHTING INDEX FIGURES.

5	4	4	1	1	1	10 ¹	10 ¹	1	3	1	2	1	7	2	1	1	1	1	1	1	1

¹ See explanation in text.

No. of Country.	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	Cobalt.	Molybdene Ore.	Bismuthum Ore.	Strontium Minerals.	Thorium Ore.	Titanium Ore.	Vanadium Ore.	Tungsten Ore.	Uranium Ore.	Radium.	Coal.	Oil.	Asbestos.	Salt.	Potash.	Natural Phosphates.	Superphosphate.	Basic Slag.	Natural Guano.	Sulphur.	Graphite Stone.	Mica.
1 ...						3	1									1	1					
2 ...																						1
3 ...				2									5									
4 ...																						
5 ...																						
6 ...				4	1						2			1	1	2	4	1	3			
7 ...					9						2			1	1		1	4	1		3	
8 ...																						
9 ...	1					7	6		2						1				1			3
10 ...																	1			1		
11 ...			3														1			1	2	
12 ...																						
13 ...											1	1	3	1		1	1			1		
14 ...								3	1	1												
15 ...		9						2			3	6		3	1	3	2			3		6

B.—WEIGHTING INDEX FIGURES.

1	1	1	1	1	1	1	1	1	1	1	1	29	46	1	1	2	2	1	1	2	1	1	1

No of Country.			45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66		
			Silicium Earth.	Wheat.		Rye	Maize.	Barley	Oats	Rice	Sugar Cane	Sugar Beets	Rubber	Timber	Wood Pulp	Cotton Seed.	Copra.	Ground-Nuts	Soya Beans.	Sesamum.	Hempseed.	Rape-seed.	Linseed.	Palm Oil.	Palm-Kernal Oil.	Olive Oil.
1	...															1										
2	...															1										
3	...	1							1					2	1											
4	...															1		1	1							
5	...	1							1			1					1	1		1				2		
6	...		2					1	1			2			1											
7	...								1			1					3							4		
8	...										1		6				3							2		
9	...	1						1		5						1		2	6		1	1		1		
10	...	1									2	2									1				8	
11	...																									
12	...		2						1					1					8							
13	...	2	5					2	3			3		2		1				9		3				
14	...																									
15	...	1		4				1	2		3	1	1	2	4		1									

B.—WEIGHTING INDEX FIGURES.

1	20	1	8	3	1	13	9	9	13	24	10	1	2	4	2	2	1	1	1	4	2	3

		Cotton.	Flax.	Hemp	Silk.	Jute	Wool	Rayon.	Electrical Energy.	Total Marks.
No. of Country		67	68	69	70	71	72	73	74	75
1	...						2			11
2	...	1							1	7
3	...								1	46
4	...				1		1			18
5	...							1	1	38
6	...		1					1	1	36
7	...							1	1	48
8	...									13
9	...	2				10				62
10	...				1			1	1	17
11	...				8			2	1	32
12	...									5
13	...	2	8	4			1		1	73
14	...						1		1	17
15	...	4					1	3	1	112

B.—WEIGHTING INDEX FIGURES.

	43	3	1	8	3	20	4	10 ¹	

¹ Estimated

C. WEIGHTED MARKS

No. of Country.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	...								1	6					2					
2	...																			
3	...							10	1	3	18				2	1	9		8	
4	...																			7
5	...	20	4	4	4	1	2	20												
6	...		8	4																
7	...	5	4	4	1	2					1				2					
8	...				1									28						
9	...					1								14						
10	...				1					3	1									
11	...					1							2							
12	...																			
13	...	10	8	4		2		10			6		1			3				
14	...					1		40												
15	...	15	12	12	1		5	50	10	1	6	1			6	2		7	2	2

No. of Country.	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1																2	1	
2						3	1												
3				2											5				
4									5										
5	1							1							1	4	8	1	3
6				4	1							58			1	12		1	4
7					9			3				58			1				1
8															1				
9		1				7	6		2	.					1				
10																		1	
11				3														1	
12	1																		
13												29	46	3	1			1	
14									3										
15	6		9					2	1	1		87	276		3	2	6	2	

No. of Country.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
1																		2	
2																			
3				1		20				1						48	10	1	
4																			4
5				2	20					1								2	4
6			3				2		3	1			9				10		
7										1	13		18	78				6	4
8												9	9	52				6	
9	2			3	20				3	65							1		8
10		1			20														
11		1	2								26	18							
12							2			1					24				
13					40	5		6	3				27		48		1		
14																			
15		3		6	20			32	3	2		27	9		24	20	4		4

No. of Country	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Total Weight Marks
1													60			75
2								43							10	58
3															10	149
4	2	1									8		20			48
5						4								4	10	123
6									3					4	10	140
7						8								4	10	260
8						4										95
9		6		8	4	2		86				30				260
10							24								10	71
11	16			1							64			8	10	151
12																28
13			9		12			86	24	4			20		10	422
14													20		10	81
15								172					20	12	10	894

F.—SUPPLEMENTARY TABLES

1.—POTATOES.

(a) PRODUCTION, 1921-1935.

	Annual Average, 1921-25.	In 1,000 Metric Tons.				
		1929.	1932.	1933.	1934.	1935.
North America ...	13,249	11,583	11,565	10,695	12,710	11,490
Europe ...		189,733	189,056	185,724	200,229	203,240
Germany ...	35,502	40,072	47,016	44,071	46,781	41,016
France ...	12,284	16,618	16,484	14,822	16,653	14,019
Poland ...	26,535	31,750	29,975	28,330	33,470	32,502
U.S.S.R. ...		47,850	45,120	49,250	51,010	69,740
WORLD ...		206,000	205,890	202,050	218,150	220,702

(b) PRICES, 1926-1935.

	In Gold Francs per 100 Kg. ; End of Year.									
	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.
Berlin, red	7 75	7 98	7 05	5 88	6 42	4 18	3 26	3 80	5 93	5 56
Czechoslovakia, for consumption	10 83	5 27	6 51	4 76	4 38	4	4 16	5 08	4 90	5 63

2.—PRODUCTION OF GRAPHITE, ASPHALT AND NATURAL GAS
IN THE "HAVE-NOT" COUNTRIES, 1928-1935.

Country.	Commodity.	Unit.	1928.	1929.	1930.	1933.	1934.	1935.
(a) <i>Germany</i>	Graphite ...	Long tons ...	17,188	21,012	24,602	19,443	17,258	21,321 ⁶
	Asphalt rock	1,000 long tons	156	143	115	43	64	71
(b) <i>Italy</i> ...	Graphite ...	1,000 long tons	6 9	7 4	5 8	3 1	3 8	5 1
	Natural gas ...	Million cubic feet	226	247	307	487	529	436
	„ asphalt	Long tons ...	2,144	904	286	301	313	719
	Asphalt rock	1,000 long tons	238	216	220	49	133	146
(c) <i>Japan</i>	Oil shale ...	Long tons ...	7,271	8,101	10,923	10,875	4,642	12,440
	Natural gas ...	Million cubic feet	970	?	?	1,657	1,664	?
	Graphite ...	Long tons ...	435	303	226	855	954	

INDEX

AGRICULTURE, 95, 148-150
Alexander, W. W., xix
 Alloys, 2
 Aluminium, 2, 4, 17-21, 201-202
Angell, Sir N., xix
 Annexations, 171-172
Anstey, V., xix, xxiv, 42, 115
 Antimony, 4, 39-40, 215
 Armaments, 180-181
 Artificial Compounds, 2
 — Silk, *see* Rayon
 Asbestos, 48-49, 224
 Automobiles, 84

Baldwin, Lord, of Bewdley, 85
 Barium Minerals, 202
Barnes, L., xix
Bastable, C. F., xix
 Bauxite, 19
Beer, G. L., xix
Benham, F. C., 96
Birch, L., xix
 Birth Control, 65, 153
 Bismuth, 215
Bradley, Ph., xix, 167
 Brimstone, *see* Sulphur
 British Dominions, 11, 107-111
 Brussels Sugar Convention, 64
Burns, C. Delisle, 167
 Business Cycle, 2, 44
 By-Products, 90

 CADMIUM, 50, 216
 Camphor, xxii
 Canadian Wheat Pool, 56-57
 Castor Oil, xxii
 Cereals, 54-61, 86, 89, 138, 228-235
 China, 75
 Chromium, xxii, 4, 21, 202
 Climate, 92-93
 Coal, 16-17, 41-45, 114-115, 199,
 218-220
 Cobalt, 40, 216
 Colonies, 36-37, 68, 73
 Congo Act, 190
 Conquest, xxiii

Consumption, Elasticity of World,
 178
 — and Prices, 117-126
 Control, 133-136
Cooke, S. R., xix, 134
 Copper, 4, 17, 21-27, 53, 97-98, 146,
 162, 203-204
 Cotton, 74-77, 250-254
Crowther, S., xix, 46, 162, 168-169
 Cryolite, 18-19
 Currency, 167-169, 171-175

Das, R. K., xix, 96, 115
Davenport, E. H., xix, 134
Diatomeae Earth, *see* Silicious Earth
Dickens, Ch., 140
 Differentiation (Discrimination) in
 Export Conditions, 68, 74,
 114-115
 Dis-investment, 147-151
 "Dissatisfied" or "Have-not"
 Countries, 13, 26, 54, 59, 80,
 105-107, 227, 266
 Dumping, 170

Edminster, L. R., xx
Edgar, Sir E. M., 134
Edgeworth, F. Y., vii, xix
 Electrical Energy, 80, 261-262
 Embargoes, 113-114, 135, 158-159
Embree, E. R., xix
Emeny, B., xix, 126-128, 130-131,
 133, 137-138
 Emigration, 148
 Employment, 154-155
 Exhaustion of Natural Resources,
 46, 147-148, 161
 Export Duties, 39, 113

Fabian Society, The, xxiii
 Fats, 71-74
 Flax, 77, 254
 Flour, *see* Cereals
 Fodder, 58, 72
 Foodstuffs, 87-91
Franco, General F., 85
 Free Trade, 147-149, 175-180

Garfias, V. R., 46, 220
 Germany, 6, 20, 27, 86-87, 88-89,
 129, 132-133, 148-150, 166-167,
 199, 200
 Gold, 8, 28-31, 168-169, 205-207
 Gold Mark, 14-15
Grady, H. F., xxiii
 Grains, *see* Cereals
 Graphite, 54, 227, 266
 Great Britain, 148
 Great Powers, xxi, 12, 64, 127
Greaves, H. R. G., xix
Gregory, T. E., xix
 Guano, 225-226

Haldane, J. B. S., 139
Hammond, J. H., 162
 Hemp, 77, 255
Herbert, A. P., 84
Higgs, H., xx
Hoare, Sir S., xxiii
Hogben, L., xix, 143, 193

IMPORT DUTIES, 176
 India, 30-31, 60, 62, 92, 95-96, 107-
 111
 Inflation, 174-175
 International Conventions and
 Agreements on Raw Materials,
 27, 35-39, 63, 117-124
 — Finance, 161-164, 166-171
 — Labour Office, 190-191
 — Trade, 87-89, 168-171
 Investments, 158
 Iodine, xxii
 Iridium, 4, 40, 214
 Iron, 2-17, 81, 194-200

JAPAN, 233
Joad, C. E. M., 139-140
Johnson, C. S., xix
 Jute, 77, 256-257

Keynes, J. M., 143, 186
Killough, H. W., xix, 3
Killough, L. B., xix, 3
Kranold, H., 108, 115
Kuczynski, R. R., xix

LABOUR, 94-96, 132-133, 152-156
Lawrence, J. C., xix, 65
 Lead, 4, 31-32, 207-209
 League of Nations, xix, xx, xxii,
 182-183, 189
 Leather, xxii
Leith-Ross, Sir F., xxiii

Lime, 50
Lippincott, I., xix, 10, 24, 195
 Lumber, *see* Timber
 MAGNESIUM, 17
 Manganese, 4, 32-33, 137, 209
McDougall, F. L., xix
 Mercury, *see* Quicksilver
Meyer, L., xix
 Mica, 54, 227
 Mineral Fertilizers, 50-53, 225-226
Mohr, A., xix, 46
 Molybdene, 4, 40, 216
 Money, 85-89
 Mono-cultivation, 151-152
 Monopoly, 38-39, 52-53, 116, 169-
 170

NAVY, 135
Neurath, O., 83
 Nickel, 4, 33-35, 137, 210
 Nitrates, 225-226
 Nitrogen, 50-51

OAK TREE, 82
 Oil, 45-48, 134, 220-224
 Oil Seeds, 70-74, 245-250
Olivier, Lord, 108
 Osmium, 40, 214

Palgrave, xx
 Palladium, 4, 40, 214
Phillips, P. D., xx, 96
 Phosphates, 225-226
 Phosphorus, 51-52
 Pigs, 86, 89
 Planning, 187-191
 Platinum, 4, 40, 214
 Platinum Metals, 4, 39-40, 214
Plummer, A., xx, xxii
 Population, 94-97
 Potash, 52-53, 225-226
 Potatoes, 58, 86, 89, 266
 Price, 138
 Protectionism, 148-150, 175-180
 Pulp Wood, *see* Timber
 Purchasing Power, 165-167
Pulitz, K. zu, xix

QUICKSILVER, 35, 210

RACES, 96
 Radium, 216
 Rayon, 79-80, 259-260
 Reason, 143-144, 192-193
Reichwein, A., xx

- Rice, *see* Cereals
Richardson, J. H., xx, 115
Robbins, L., xx, 144
Roesler, M., 195
Rowe, J. W. F., xx
Royal Institute of International Affairs, 109-110
 Rubber, 64-68, 81-82, 238-240
 Russia, 16, 73-74, 199, 253

 SALT, 49-50, 224
 Saltpetre, *see* Nitrates
Sargent, A. J., xx
 "Satisfied" or "Have" Countries, 13, 105-107
 Scrap Materials, 3-8, 25, 35, 81, 136-138
 Self-sufficiency, 130-132
 Sham Rationalization, 143
Shaw, G. B., 159-160
 Sheep, 78
Shudo, Y., xxiii
 Silicious Earth, 54, 227
 Silicon, 17
 Silk, 77, 255-256
 Silver, 28-31, 205-207
 Small Powers, xxi, 172
Smith, A., 155
 Soil, 94, 147-150
 Spelter, *see* Zinc
Stahn, J., 85
 Standard of Life, 112-117
 Statistics, 1, 2, 43-44, 54-56, 69, 73-74, 75-76, 81, 88, 91, 138
 Steel, 2-17, 21, 118-119, 195-200
Stevenson, Sir James (now Lord), 65, 179
 Stevenson Plan, 65-67, 117-118
 Stocks, 136-137, 178-179
 Strontium, 40, 216
Stucki, W., xxiii
 Substitutes, 82-83

 Substitute Rationality, 145
 Sugar, 61-64, 86, 89, 235-238
 Sulphur, 53-54, 226-227
Swettenham, Sir F., 39

 TANNING MATERIALS, xxii
Teagle, W. C., 46
 Thermit, 18
 Thorium, 40, 217
 Timber, 69-70, 240-244
 Tin, 4, 35-39, 119-120, 210-212
 Titanium, 40, 217
 Transport, 136, 184-186
 Tungsten, 40, 217

 UNITED STATES OF AMERICA, 4-5, 6, 7, 33, 68, 93, 130-132, 137, 166, 168-169, 176, 183-184
 Uranium, 217
 Use of Raw Materials : Rationality in, 156-164, 167
 U.S.S.R., *see* Russia

 VANADIUM, 2, 4, 40, 217
 Versailles, Treaty of, 143, 158

Wallace, B. B., xx
 War, 127-133, 135-141, 181-187
White, D., 46
Wilson, W., 143
Woker, G., 139
 Wolfram, *see* Tungsten
Wood, G. L., xix, 96
 Wood Pulp, 70, 244
Woofster, T. J., jnr., xx
 Wool, 77-79, 257-259
Workers' Educational Association, The, xxiii
 World Trade, 14-15

Zimmermann, E. W., xx, 4, 5
 Zinc, 4, 39, 212-214

PRINTED IN GREAT BRITAIN BY
MACKAYS LIMITED, CHATHAM

