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**A STUDY IN  
SOCIAL ECONOMICS**

**THE HUNTER RIVER  
VALLEY**

**F.R.E. MAULDON**



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**A STUDY IN SOCIAL ECONOMICS**

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A STUDY IN  
**SOCIAL ECONOMICS**

THE  
HUNTER RIVER VALLEY  
NEW SOUTH WALES

BY

F. R. E. MAULDON, B.A., M.Éc.

FOR REVIEW

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TO  
THE W.E.A. STUDENTS  
OF THE  
HUNTER RIVER VALLEY

## GENERAL PREFACE.

The scarcity of authoritative Australian books on economic and political problems has been severely felt during the development of the Workers' Educational Association in the Commonwealth. On the foundation of the Federal Council of the W.E.A., in 1918, a means of overcoming this difficulty was sought. Among the professors, lecturers, and tutors, who have so readily assisted the tutorial class movement, some had collected valuable material bearing on these problems. Through the Federal Council it was thought possible to assemble some of this material for publication in a series of monographs intended for the use of students in tutorial classes and elsewhere. Thus has the W.E.A. Series of publications been founded, and it is hoped that its utility will extend beyond the immediate needs of members of the W.E.A. to the growing number of students of social problems in Australia.

The chief aim of the Series being to encourage investigation in fields of study hitherto surprisingly neglected in Australia, the W.E.A. does not accept responsibility for the views expressed by the writers therein. Its purpose is to stimulate thought, not to propagate doctrines. A disclaimer of this kind may appear odd in a preface, but our experience of the persistency with which our critics insist on attributing to the Association the opinions of those who happen to be connected with it has convinced us that it is necessary.

G. V. PORTUS,  
General Editor.

## AUTHOR'S PREFACE.

What appears in the following pages has been collected and prepared as opportunities have offered during the writer's busy activities as University District Tutor for the W.E.A. on the Hunter from 1921 to 1925. His duties necessarily brought him into contact with most phases of economic life in the Valley. It is thus rather his expositor's habit of assembling, classifying and interpreting the facts of economic life viewed as a whole than any claim he can make to detailed knowledge of its parts that may justify this first imperfect essay at a regional survey of the Hunter.

The writer is aware that all chapters will not have equal appeal to the general reader, and that, in particular, the two opening chapters may seem to be burdened with the tedium of details likely to be of interest solely to the physiographer. To such readers perusal of the summaries at the conclusion of each of the two chapters is suggested. The writer is further aware that his critical comments scattered throughout the volume are unlikely to meet with entire approbation in every quarter. That, of course, is the inevitable penalty of entering upon a critical examination of the diversified field of livelihood-getting and all its contrarities. He has throughout, however, endeavoured to adopt the detached viewpoint of a student of economics and social welfare.

I wish to acknowledge my indebtedness to the many who have so readily provided me with the information I have sought; to those (and more particularly Mr. Mark Reid, of Newcastle) whose support has made the publication possible; to the students of my Economics Tutorial Classes, for their salutary criticism in class discussions; and more especially to one of them, my wife, for her help, which has been as inspiring as it has been many-sided.

F.R.E.M.

Melbourne, Jan., 1927.



# INTRODUCTION

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## THE AIM OF THE BOOK

The Hunter River Valley of New South Wales is a laboratory where the student of human activity will find abundant material for research.

Here he need delve very little to discover the all-powerful natural factors which determine types of community, modes of livelihood-getting, and the distribution and qualities of population; for these factors are present with self-evident obviousness. Here he may observe, in a small scope, the same processes which produced the thickly populated industrial belts of Europe and America—the clustering of people about the rich resources of manufacturing power. Here he will come upon the same economic problems of production, industrial control, and wealth distribution, the same wide problems of class differentiation. The amazing growth of new towns and markets, and the stagnation and declension of others, where (as when collieries invade the farming areas) the law of increasing returns asserts itself with unequal force, will at once provide him with contemporary illustration of similar movements in economic history and illuminate economic principle.

The aim of this book is to describe and analyse the industrial life of the people of the Hunter River Valley; to trace the necessary relationships between them and the material conditions encircling them; to discover in what ways these conditions are affecting them, and how they, in turn, are modifying their environment. The purpose in view is not to establish pre-suppositions.

To compass such an aim enquiry must be pursued along many channels for the search of what is significant in a multitude of assorted facts. It will first of all be necessary to ask what are the permanent factors of physiography, which prescribe the extent and quality of the natural material gifts which the people use. These same factors are decisive in determining the types of livelihood-getting in the Valley. From an enquiry into physiography, we therefore pass inevitably to an examination of the industries of the district. The transition

will have been fruitful in revealing the direct relationship<sup>1</sup> of the three broad types of industrial activity — primary, extractive, manufactural—to the three-fold aspect of the Valley's physiography.

Commerce is the great connective activity of the industrial system. Its intricate mechanism of markets, of finance, and of transport facilities exists to subserve the processes of production (in the narrower sense of "transforming" raw materials), whether in primary, extractive, or manufactural industry. The next direction of our enquiry may therefore not illogically be into the transport, communication and other exchange facilities for the products of the Valley. Thereupon, the inter-relationship of the industries having thus been considered, we may with profit examine certain important phases of industrial organisation, represented in the several types of economic structure built up by enterprisers, operatives, and consumers.

An examination of the inter-play of so many human and material factors will reveal many problems, some of them purely local in their interest, but others of direct concern to other portions of the State and Commonwealth. The outstanding unsolved problem lies not in the relationship between the people and the resources of material welfare, but in the relationships of the people themselves; not primarily in the distribution of the actual wealth, but in the mutually hostile attitudes arising therefrom, for the removal of which there is neither perspicacity nor moral initiative enough among the people as a whole. The people themselves may, then, fruitfully occupy our attention. We shall observe how they are distributed—by density of numbers, by locality, by occupation—and how such distribution may affect their habits. We shall endeavour to isolate some of the factors which condition their physical, mental, and spiritual health.

The life of any community is a wonderful synthesis wrought by innumerable physical and social influences, many of which will elude the subtlest analysis. In what follows only such influences will be considered as can be discerned plainly to affect the life of the Hunter River communities.

1. This relationship may be seen at a glance on the chart Table of Contents facing this Introduction.

## TABLE OF CONTENTS

<b>INTRODUCTION.</b> p. i.	<b>CHAPTER I. p. 1.</b> <b>THE SHAPE OF THE VALLEY.</b> (Topography)	<b>CHAPTER II. p. 7.</b> <b>THE SUBSTANCE OF THE VALLEY.</b> (Geology)	<b>CHAPTER III. p. 31.</b> <b>THE POSITION OF THE VALLEY</b> (Geography)																				
<b>CHAPTER IV. p. 38.</b> <b>LIVELIHOOD FROM THE LAND.</b> (Primary Industry)	Sheep, Cattle and Horse Raising, Wheat, Fodder-crop, Maize, Cotton Growing, Vine, Citrus, Stone-fruit Growing, Dairying (Milk, Butter and Cheese Production), Mixed Farming.	Distribution of Soils.	Distribution of Rainfall and Natural Irrigation.																				
<b>CHAPTER V. p. 57.</b> <b>LIVELIHOOD FROM COAL-MINING.</b> (Extractive Industry)	Distribution of Coal Measures.	Coal Mining (Natural Oil), Blue Metal, Gravel and Clay Quarrying.																					
<b>CHAPTER VI. p. 85.</b> <b>LIVELIHOOD FROM MANUFACTURES.</b> (Manufactural Industry)		Bricks, Pipes, Cement.	Iron and Steel—Rails and structural shapes, galvanised iron, wire, wire-netting, nails, wire-rope, steel tyres and axles, ship-building, structural engineering, etc. Fertilisers, Tars, Motor Spirits, Acids, etc. Cotton-ginning, Soap, Foods, Drinks, etc.																				
<b>CHAPTER VII. p. 184.</b> <b>LIVELIHOOD IN TRANSPORT AND COMMERCE.</b> (Connective Industry)	Railway Transport.	Commercial Activities. Motor Transport.	Waterway Transport. Shipping.																				
<b>CHAPTER VIII. p. 155.</b> <b>ECONOMIC DEFENCE ASSOCIATIONS.</b>	Enterpriser . . . .  Operative . . . .  Consumer . . . .	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Primary.</th> <th style="width: 25%;">Extractive.</th> <th style="width: 25%;">Manufactural</th> <th style="width: 25%;">Mercantile.</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: center;">Newcastle Chamber of Commerce.</td> </tr> <tr> <td>Farmers' Graziers' Stock-raisers and Orchardists Assns. &amp; Producers' Co-op. Societies, Etc.</td> <td>Northern Collieries' Association.</td> <td>Newcastle Centre, N.S.W., Chamber of Manufactures, Etc.</td> <td>Stevedores' Assn., Warehousemen's Assn., Retail Traders' Assn., etc.</td> </tr> <tr> <td>Australian Workers' Union.</td> <td>Mining Dept., W.I.U. of A., and two other Unions.</td> <td>26 Craft Unions.</td> <td>24 Craft or Professional Unions.</td> </tr> <tr> <td colspan="4" style="text-align: center;">10 Co-operative Retail Societies. N.S.W. Co-operative Wholesale Society.</td> </tr> </tbody> </table>	Primary.	Extractive.	Manufactural	Mercantile.	Newcastle Chamber of Commerce.				Farmers' Graziers' Stock-raisers and Orchardists Assns. & Producers' Co-op. Societies, Etc.	Northern Collieries' Association.	Newcastle Centre, N.S.W., Chamber of Manufactures, Etc.	Stevedores' Assn., Warehousemen's Assn., Retail Traders' Assn., etc.	Australian Workers' Union.	Mining Dept., W.I.U. of A., and two other Unions.	26 Craft Unions.	24 Craft or Professional Unions.	10 Co-operative Retail Societies. N.S.W. Co-operative Wholesale Society.				
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<b>CHAPTER IX. p. 180</b> <b>THE PEOPLE AND THEIR OCCUPATIONS.</b>	Occupation on Population Distribution; Population Distribution on Local Government; Occupation on Health Hazards; Occupation on Habits and Outlook.																						

## **BASIC FACTORS OF PHYSIOGRAPHY.**

Three great basic factors of physiography have determined the direction of all human activities in the Hunter River Valley. They are:—

- (1) The Shape of the Valley (its Topography).
- (2) The Substance of the Valley (its Geology).
- (3) The Position of the Valley (its Geography).

A logical order of treatment of these fundamental determinants would give priority to geographical position. But throughout this book, for reasons that will become apparent, they will be considered in the order named.

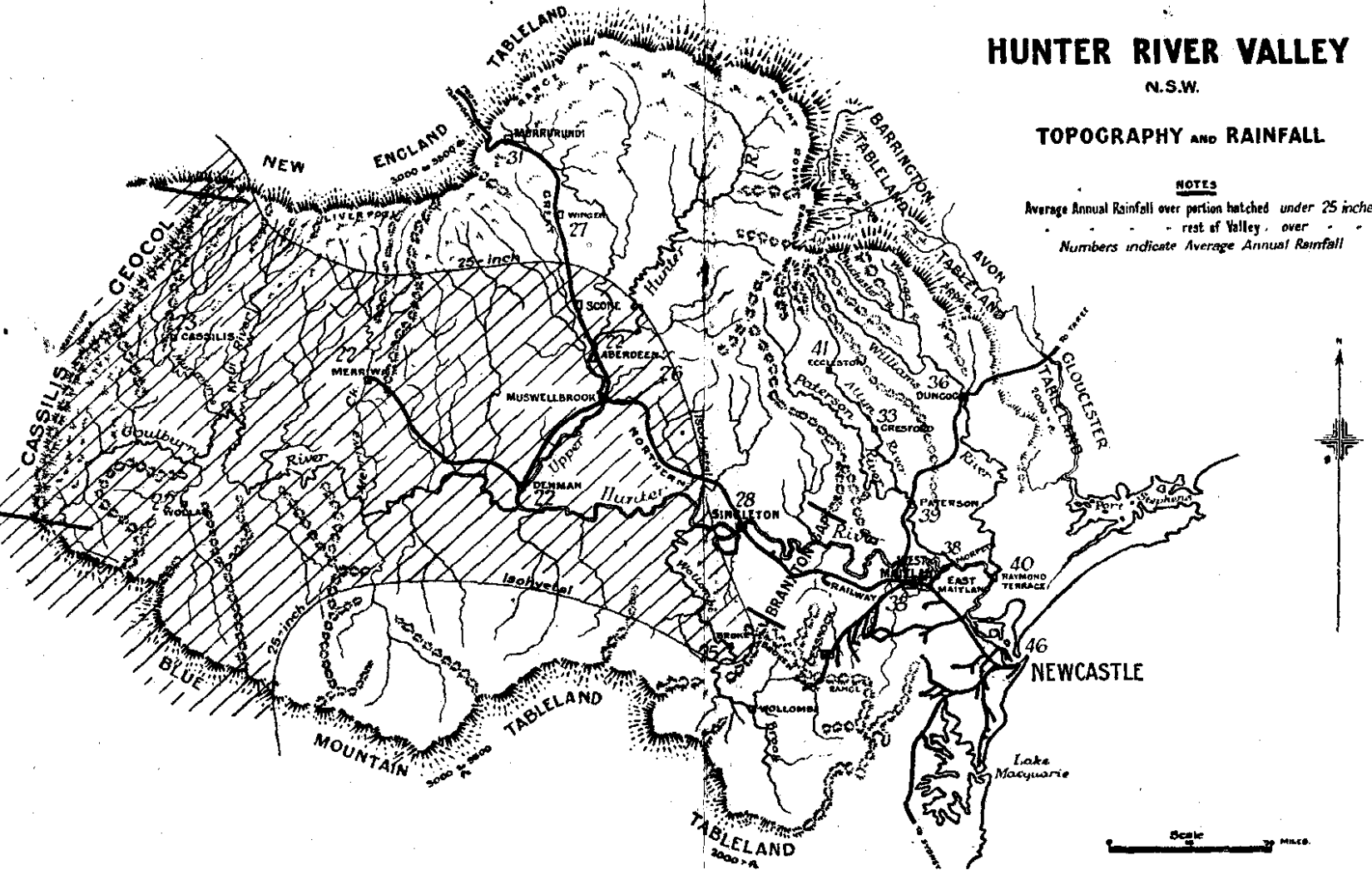
# HUNTER RIVER VALLEY

N.S.W.

## TOPOGRAPHY AND RAINFALL

### NOTES

Average Annual Rainfall over portion hatched under 25 inches  
rest of Valley, over  
Numbers indicate Average Annual Rainfall



## CHAPTER I.

### THE SHAPE OF THE VALLEY

#### ECONOMIC IMPORTANCE OF TOPOGRAPHY.

The basin of the Hunter River and its tributaries comprises a tract of coastal country resembling, in the outline of its boundaries, a misshapen ellipse.<sup>1</sup> Along its major axis it is traversed by a main stream running for seventy miles (as the crow flies), almost due east, to the Pacific. The upper reaches of this stream are known as the Goulburn River. The minor axis is marked, on its northern side, by a southward moving stream, which, together with the "consequent" stream made by its junction with the Goulburn, is known as the Hunter River proper. The southward running channel from its source to this junction is called the Upper Hunter. Because of its greater water volume, the Upper Hunter is economically more important than the Goulburn, but it is convenient physiographically to regard the stream running west-easterly to the sea, comprising the Goulburn, Mid-Hunter and Lower Hunter, as the main vertebral waterway of the Hunter River system.

The Upper Hunter, itself fed by valuable tributary streams, is, of the numerous branches flowing into the main river in its northern side, the feeder of greatest consequence. From its northern watershed the Hunter River receives a rich yield of tributary waters; from the rugged sandstone spurs of the southern watershed, however, the contribution is but scanty. The only notable tributary on the south of the Hunter is the Wollombi Brook. Those on the north include the exceedingly important Williams and Paterson Rivers (with their respective feeders, the Chichester and the Allyn) to the east of the Upper Hunter, and, to its west, the less significant Wybong and Merriwa Creeks, the Krui River, and the Munmurra Brook.

This one-sided system of water distribution—in reality a great natural system of irrigation—has had, as the development of the book will show, a marked influence

<sup>1</sup> To follow this description, refer to map of topographical features, Map No. 1.

upon the distribution of the primary producing population of the region. The explanation of the curious disparity is to be read in the topography of the Valley's boundaries.

The draftsmanship of the maps of the Hunter River usually depicts the Valley as almost completely encircled by mountain ranges of more or less uniform altitude. This is highly misleading.

In reality the Valley on its northern and southern sides is flanked by lofty tablelands of heights varying from 1800 to upwards of 5000 feet, while on the west it is separated from the western plains by a great open gateway—a watershed whose highest point is not more than 1600 feet above sea-level.

Along ten miles of the northern frontier nearest the coast the land rises through 2000 feet to the first of the tablelands—the Gloucester. Neighbouring this on the west is the higher Avon Tableland (about 3000 feet). Westerly again, and of a still more lofty elevation, lie the great mountain masses of the Barrington Tableland (from 4000 to 5000 feet), known also as the Mount Royal Range. The Barrington mountains break off abruptly on their southern side in a number of great step-faults. South-easterly from their precipitous east-west face run the spurs (of altitudes diminishing from 2000 to 1000 feet), which form the divides separating tributaries of the Upper and Mid-Hunter from the Paterson-Allyn Valley and the latter from the basin of the Williams and Chichester. These spurs, as will be seen, play a significant role in the influence exercised by topographical environment.

Westward and northward of the Barrington, but at a lower general elevation (from 3000 to 3500 feet), lies the New England Tableland, whose southern edge is the Liverpool Range. This range trends westerly far beyond the western limits of the Hunter River Valley.

As a surface feature the western boundary of the Valley is scarcely distinguishable from the surrounding country, being merely one in a succession of southerly ridges, which corrugate the region. It is marked off from its fellows, however, by the important fact that it forms the great divide between coastal and inland river systems. It has been named the Cassilis geocol.<sup>2</sup> We have already

<sup>2</sup> By Professor T. Griffith Taylor, who, however, prefers to call it the Cassilis Gate.

referred to it as a natural open gateway to the west. It is really a breach in the north-south tableland zone of N.S.W. As a geographical factor it has already produced certain economic results, and in the future will decisively determine lines of economic development.

The southern boundary of the Valley is the northern edge of two elevated regions. The more westerly of the two is the Blue Mountain Tableland, somewhat less in elevation than that of New England, i.e., from 3000 to 3500 feet. Where it overlooks the Hunter River Valley it is called the Hunter Range. The second tableland diminishes gradually eastward from about 2000 feet. Its northern edge, known as the Broken Back Range, and one of the spurs of the Mount Royal Range to the west of the Paterson bend towards one another, and so contract the Valley to a relatively narrow width between Singleton and Maitland. This narrow "front gate," through which the Hunter passes, is no less significant economically than the much wider "back gate" of the Cassilis geocol. It is not more than ten miles wide in the vicinity of Branxton (whence it derives the name Branxton Gap<sup>2a</sup>), and serves to divide the smaller low-lying area of the Lower Hunter from the 7000 square miles of hill and down country which widens out to north-west and west.

#### SIGNIFICANCE OF THESE FACTS OF TOPOGRAPHY.

We have already several times hinted at the economic importance of the shape of the Valley. In what more precise ways is this to be demonstrated?

In the first place, the location of the elevated boundaries of the Valley and the distribution of their varied altitudes have a most marked effect upon the extent and spread of rainfall—a fundamental natural requisite of production.

In Australia the coming of rain is connected with low atmosphere pressure, produced by the two travelling air current systems which move easterly across the continent—one across the northern half (monsoonal disturbances) and the other across the southern (antarctic disturbances). Sometimes the antarctic low pressure area moves northward, trespassing upon the zone of monsoonal disturbance; at other times the incursion is reversed—the monsoonal invading the southern parts. Now it so happens that the Hunter River Valley lies about

<sup>2a</sup>. So named by Mr. C. A. Sussmitz, F.G.S., in his address before Newcastle Branch, Institution of Engineers, 27th March, 1930



half-way between the west-east tracks normally traversed by these disturbances, and is therefore at different times affected by each, with its moisture-laden atmosphere. If the southward-surgings monsoon drives along its rain clouds far enough south, and with sufficient vigour, rain is precipitated throughout the whole Valley—thanks to its elevated southern walls. The antarctic rain winds, on the other hand, blow up from the south-east. The shape of the Valley affects them with a three-fold result.<sup>3</sup> Through the ten-mile-wide Branxton Gap access to the Upper Hunter region is given to a narrow draught of the moist atmosphere, but it has to reach the Liverpool Range before meeting conditions compelling it to drop its precious burden. On the south and south-east of the Valley the antarctic winds are robbed of their moisture by the high tops of the Hunter and Broken Back Ranges. They therefore sweep across the greater part of the Valley rather as *moisture-absorbing* winds, unchecked by any high barrier in the region of the Cassilis geocol, and are deprived again of their new and slighter water-burden only when precipitated along the foothills of the Liverpool mountains. A third part of the moist south-easter finds itself driving along the valleys of the Williams and the Paterson. Along the flanks of these tracks a goodly volume of the moisture is precipitated by the dividing spurs. At the head of each valley the south-easter finds itself forced up on to the colder heights of the Barrington Tableland, where are condensed the heaviest rains of the Hunter River watershed.

It is to be observed, therefore, that rainfall comes with unequal bounty upon different parts of the Hunter Valley. Actually the Valley can be divided into two areas of high and low rainfall, the former averaging, for at least the last quarter of a century, a fall of 39 inches—typical of a coastal climate; the latter, subject to relative dryness, like that of the middle-west, with an average fall of under 25 inches. Along the east of N.S.W. the 25-inch isohyetal runs parallel to and west of the north-south belt of tablelands, but abreast of the Hunter Valley it swings easterly in a great salient.<sup>4</sup> The curved line of this isohyetal marks the divide between the two rain areas, and roughly defines the boundary between regions on the one hand predominantly pastoral, and on the other chiefly agricultural. The relative dryness of the central and western portions of the Valley is, we have seen,

3. The reader is again referred to Map No. 1. 4. See Map No. 1.

mainly due to the infrequency and uncertainty of monsoonal visitation,<sup>5</sup> and to the divesting, by the southern ranges, of the antarctic winds of their moisture. The Cassilis Geocol is an important factor in relation to the latter winds. It is a climatic factor of further importance in allowing the parching summer western winds to sweep across it unchecked, thus accentuating the normal dryness of the western half and centre of the Valley. It is significant that the indigenous vegetation of this area corresponds to that of the Central West, not to that found elsewhere on the coast east of the main divide.

A comparison of the actual average rainfalls over a number of years will make clear the difference between the two rain areas:—

*Rainfall of the Central and Western Parts.<sup>6</sup>*

Centre.	No. of Years.	Average Rainfall.	Highest Year.	Lowest Year.
Aberdeen . . . . .	25	22.42	33.07	12.24
Broke . . . . .	33	24.59	43.02	12.08
Belltrees . . . . .	40	26.59	41.09	11.89
Cassilis . . . . .	48	23.34	37.71	11.07
Denman . . . . .	37	22.03	40.21	10.69
Glenbie . . . . .	21	20.87	31.86	11.72
Hunter Vale . . . . .	21	25.56	38.99	14.76
Merriwa . . . . .	38	22.32	34.57	6.47
Murrurundi . . . . .	48	30.88	61.54	14.85
Wollar . . . . .	17	22.64	34.48	15.76
Wingen . . . . .	43	27.53	49.89	12.32
Singleton . . . . .	37	28.31	49.83	15.91

*Rainfall of the Eastern and Northern Parts.*

Underbank . . . . .	13	38.49	54.12	26.88
Dungog . . . . .	20	36.15	52.67	20.33
Stroud . . . . .	30	45.82	74.78	24.56
Gresford . . . . .	22	33.20	47.58	15.38
Paterson . . . . .	16	39.61	52.06	27.04
Eccleston . . . . .	8	41.10	52.27	32.00
West Maitland . . . . .	52	33.62	64.46	18.95
Raymond Terrace . . . . .	26	40.50	64.53	25.54
Morpeth . . . . .	35	38.10	78.49	22.34
Newcastle . . . . .	55	46.51	79.84	25.21

These tables make manifest the great material advantage the shape or topography of the Valley has given to the rural population of the Paterson and Williams and the Lower Hunter.

SUMMARY.

This opening chapter has defined the outstanding facts of topography for the Hunter River Valley, and

5. Rainfall from this source, however, was abundant during 1924.

6. These tables are quoted by Mr. Sussmitch in his address, from which most of the above facts of topography are drawn.

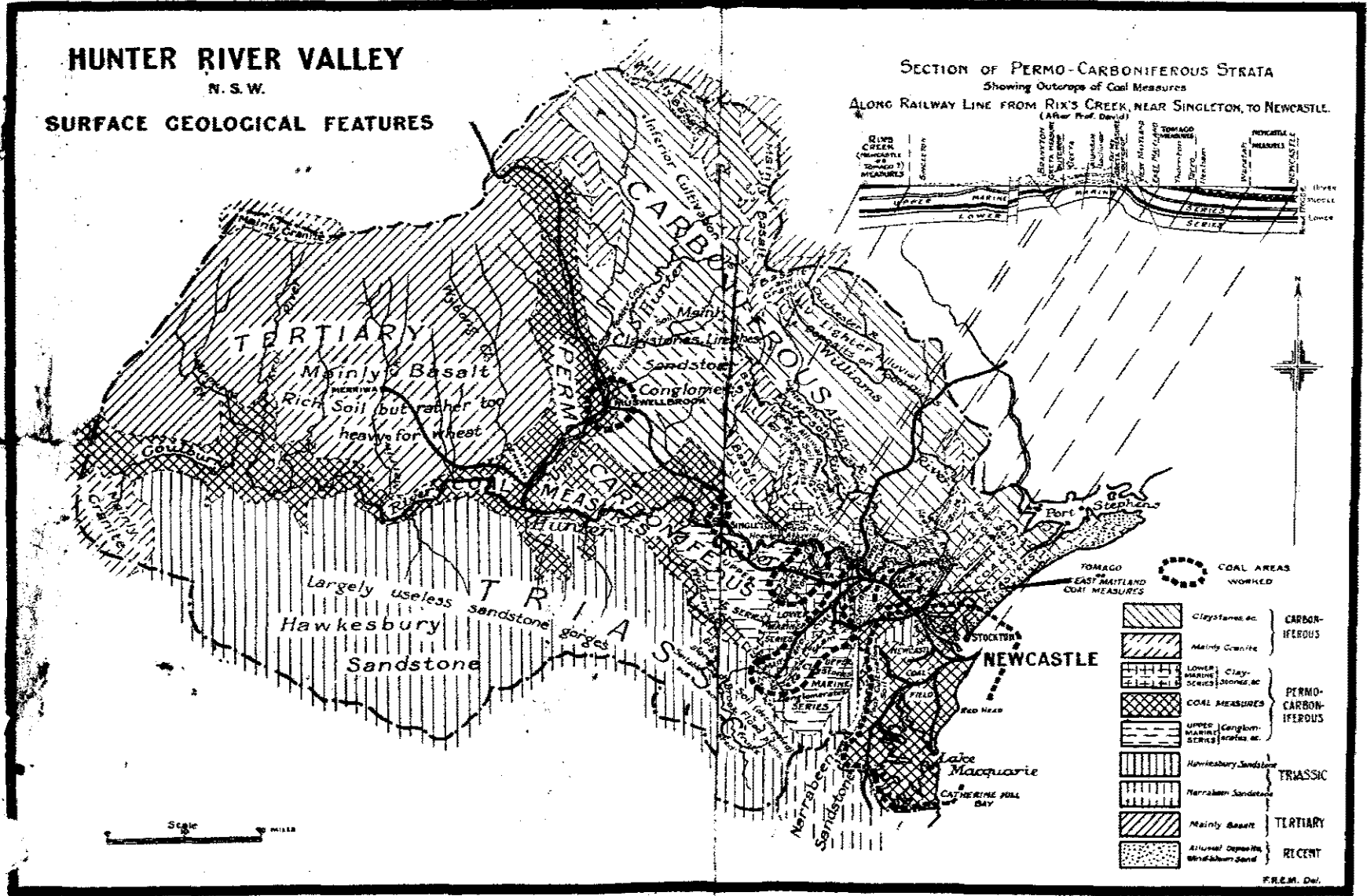
suggested their basic importance for the economic activity of its inhabitants, mainly, in the sphere of primary industry. The Valley, it was seen, is so shaped as to cause (1) unequal distribution of running streams and of their water volume, and (2) unequal distribution of rainfall. A disproportionately greater number of tributary streams are found to drain the northern than the southern half of the Valley, and of these the fullest-flowing are in the north-east. The distribution of the circumjacent tablelands, however, is the main topographical factor. These tablelands, contrary to popular assumptions based on misleading cartography, do not fully encircle the Valley on its landward sides. The wide breach of the Cassilis Geocol to be found on the west, and the narrow opening of the Branxton Gap in the east, are extremely effective controls, giving direction to atmospheric movements, and therefore to the distribution of the moisture upon which all plant and animal life is inescapably dependent. The direction given to the fall of rain results in a relative dry area in the west of the Valley, leading in the main to pastoral pursuits, and in the east in a moist region given chiefly to agriculture.

# MAP 2

## HUNTER RIVER VALLEY

N. S. W.

### SURFACE GEOLOGICAL FEATURES



## CHAPTER II.

### THE SUBSTANCE OF THE VALLEY

### ECONOMIC IMPORTANCE OF GEOLOGY

The Hunter River Valley<sup>1</sup> received its present general configuration, probably between 500,000 and one million years ago, at the close of what the geologists term the tertiary<sup>2</sup> period of the Cainozoic Era. The Cainozoic, in the long stretch of geological time, was a comparatively recent era of about three million years' duration. Now, part of the Hunter Valley's most recent surface was "laid down" during the tertiary period. It was the product of violent volcanic activity of the time—the spreading of great floods of basaltic lava over hundreds of square miles of country. The weathering of this material has since produced some of the richest agricultural soils of N.S.W. Thus practically the whole of the country through which the northern tributaries of the Goulburn flow is composed of heavy decomposed basalt.<sup>3</sup>

In this north-west quarter of the Valley, the soil is too heavy for wheat-growing, and its value for other agricultural purposes is discounted by the absence of rains. The presence, on the other hand, along the headwaters of the Upper Hunter, Paterson, Allyn, Williams, and Chichester, of large and small scattered patches of the same surface material accounts for the rich alluvial flats to be found about their middle and lower reaches. The heavy rains, particularly in the region of the Mount Royal Range, sweep down these watercourses, and, flooding every accessible area of low-lying ground, year after year leave a new surface of extremely fertile alluvium. The richest agricultural land on the Hunter lies between Raymond Terrace and Maitland, for here are deposited the flood silts of at least three important streams.

A much older formation occupies the surface along almost the whole southern length of the Valley between the main vertebral stream and the southern ranges.<sup>4</sup> This is the triassic sandstone belt laid down in the Mesozoic Era, between nine and twelve million years ago. It is

1. To follow this description, refer to map of geological features, Map No. 2. 2. "Tertiary" is also used interchangeably with Cainozoic to name the era; I have used Mr. C. A. Sussmilch's terminology, and Prof. J. Arthur Thomson's possibly too conservative time estimates. 3. Shown on Map No. 2. 4. Shown on Map No. 2.

generally inferior country. It comprises the uninviting and utterly useless sandstone gorges which, on the west, provide channels for tributary creeks on the south of the Goulburn, and, on the east, the more pleasant and habitable gullies of the Wollombi, which, however, is a relatively poor area, where farming is no easy struggle with nature. The poorest soils of the Valley are found along this tract, which forms the northern limit of the great belt of Hawkesbury sandstone.

The remainder of the strata outcropping on the Valley's surface was established during the last two periods of a still more ancient geological era — the Palaeozoic. The earlier of these two periods was the Carboniferous—the time when insects were beginning to emerge as forms of life entirely independent of water as a habitat, long before the rise of reptiles, birds, flowering plants, and the mammals, including man. In that remote age (from twelve to thirty million years ago) there was "laid down" most of the country stretching south and south-easterly from the northernmost limits of the Valley—roughly, that portion north-east of the great northern railway line.<sup>4a</sup>

The surface substance is mainly claystones and mudstones. It is to be noticed that the stretch embraces some of the richest agricultural country of the Valley, not because claystone and mudstone make fertile soils (they are exceedingly poor), but because the farmers cultivate their crops upon alluvial patches, which are the flood-washings of the decomposed tertiary basalts from the mountain tops. The fertile areas of the Williams and Paterson are rich despite their carboniferous origin. In these areas carboniferous strata are said to be 19,000 feet thick, and, striking the surface at an angle of about 60 degrees, streak the country with limestones, claystones, conglomerates, tuffaceous sandstones, cherty shales, and contemporaneous lavas and tuffs.<sup>5</sup> In later carboniferous times, volcanic activity was intense. No less than twelve distinct lava flows are found in the area about Paterson and Clarence Town, on the lower reaches of the Paterson and Williams Rivers.

#### COAL.

The later of the two Palaeozoic periods was the

<sup>4a</sup> Shown on Map No. 2. <sup>5</sup> Sussmitch: "Introduction to Geology of N.S.W." 1911

Permo-carboniferous, which succeeded the Carboniferous. Nature in permo-carboniferous times began her work of building up the great storehouse of N.S.W. coal seams, which, within the boundaries of the State, are accessible for man's use over an area of 15,000 square miles.<sup>6</sup> The Hunter River Valley is remarkable, not only in that it is economically the most productive part of this great area, and is certain to continue to be, but, from the geological standpoint, in that probably no part of the world shows a greater development of permo-carboniferous rocks. Here they reach a thickness of from 15,000 to 16,000 feet—a thickness by 6000 feet greater than similar strata in Texas, the only other comparable region on the globe's surface.<sup>7</sup>

In this book we are not pre-occupied with geological interest. We are, however, concerned to know something of the formation, location, accessibility and qualities of the coal which, of all the materials which make up the substance of the Valley, is the greatest as the basis of wealth production. For these facts we must turn to the geologists.

Late carboniferous times witnessed intense volcanic activity. It caused in this region the rolling up of parts of the earth's surface into mountains. The remains of these mountains are to be seen to-day in various parts within the Valley, and on its borders, in great granite intrusions.<sup>8</sup> The period of volcanic activity was followed by a remarkable ice age, which ushered in the permo-carboniferous times. Thus, says Professor David,<sup>9</sup> "the plants which built the peat beds which, later were to form our coal field, grew under conditions of a cold climate; conditions, too, of rapid changes in physical geography, when large rivers were forming great masses of silt over vast and quickly sinking coastal plains; conditions, too, of frequent volcanic eruptions, which filled the air over a great part of Australia with finely powdered felspar and volcanic glass, which went to form the thick beds of chert, perhaps the most characteristic of all the non-carbonaceous rocks of our Coal Measures. . . . During this period a thickness in the aggregate of no less than 200 feet of coal was produced."

6. N.S.W. Mines Dept Bulletin No. 6: "Coal Resources of N.S.W.," 1925. 7. David: "Memoir on the Geology of the Hunter River Coal Measures," 1907, pp. 310-311. 8. Shown on Map No. 2. 9. David: "Memoir," Introduction.

## WHERE THE COAL IS FOUND.

## (a) Surface Areas.

This coal, as far as the Hunter is concerned, underlies all that surface of the Valley which is not included in the carboniferous area on the north-east,<sup>10</sup> being part of the greater coal-bearing region extending from Gun-nedah to the Clyde River.

The accessible portions of the coal, however, lie only in the strip of the Valley where the permo-carboniferous strata form surface outcrops. This strip stretches along the vertebral stream, mainly on its southern side, with a width varying from 15 to 18 miles, to the district about the junction of the Goulburn and Upper Hunter. Here, meeting the tertiary basaltic overlayers, it splits into two arms, one narrowing along the great northern railway line towards Murrurundi, and the other along the Goulburn.

Yet of the numerous materials composing the permo-carboniferous system, and stretching downwards in parts for upwards of three miles, *coal forms merely a number of shallow interlining layers, with a total thickness, as we have observed, of not more than 200 feet.* Coal is found in seams streaking three distinguishable series of strata, known as Coal Measures, whose total thickness does not exceed 2500 feet. These coal measures are the most frequent surface representative of the permo-carboniferous in the Valley. In some parts, however, especially in the Mid-Hunter region, other strata, containing little or no coal, and known as the Upper and Lower Marine Series, form surface areas of sandstones, claystones, and conglomerates, like those of the coal measure country itself.

But what of the accessibility of the coal? The meaning of accessibility is realised by understanding not only how and at what depths the strata lie above one another, but also how the folding, "faulting," and weathering of the earth's crust have combined to modify the relationship of surface and strata.

First, then, what is the composition of the permo-carboniferous system; and, secondly, what have been the combined effects upon it of earth movements and weathering?

We may answer this twofold question graphically by examining a cross-section of the system as it stretches

10. See Map No. 2.



along the railway line between Newcastle and a little beyond Singleton.<sup>11</sup>

It will be noticed that the permo-carboniferous strata along this section do not lie horizontal to the surface of the country traversed. From Newcastle, where all but the topmost portion of the highest stratum are represented, the layers slope upwards and in turn out-crop westerly on the surface, the lowest stratum of all showing itself near Farley station. About eight miles further west, near Greta station, this same layer finishes as a surface and dips down again, together with the upper layers, which re-appear successively towards Singleton. It is obvious that the permo-carboniferous system at one time was bunched into a great mountain mass, some 9000 feet above the present land surface, at Lochinvar. Subsequent weathering, however, has worn away this huge protuberance to existing levels.

(b) Measures and Seams.

If we examine the cross-section at the Newcastle end we observe a greater number of rock-layers than elsewhere along the stretch chosen. Not actually at Newcastle itself, but several miles south, the whole strata of the system are assumed by geologists to exist in unbroken descent. They are grouped into five series of rocks, and are named in the following descending order:—

*Strata in the Permo-Carboniferous System.*

Series.	Maximum Thickness
<i>Upper, or Newcastle, Coal Measures</i> . . . . .	1,500 ft.
Dempsey Series . . . . .	3,000 "
<i>Middle, Tomago or East Matilana Coal Measures</i> . . . . .	1,700 "
Upper Marine Series . . . . .	6,400 "
<i>Lower, or Greta, Coal Measures</i> . . . . .	300 "
Lower Marine Series . . . . .	4,800 "
Total . . . . .	17,700 "

The Upper, or Newcastle, Coal Measures vary in thickness from 1,400 to 1,500 feet, and are the most extensive coal strata in the district. They possess ten commercially valuable seams, of thickness varying from three to ten feet, as well as several others, which, though by no means useless, do not at present pay to exploit. The total thickness of workable coal is between 35 and

<sup>11</sup> See cross-section shown on Map No. 2, adapted from Section IV. in Prof. David's "Memoir on the Geology of the Hunter River Coal Measures."

40 feet. The various strata, with their average thickness, have been distinguished as follows:—

*The Upper, or Newcastle, Coal Measures.*

Stratum.	Feet
<i>The Upper Set—</i>	
<i>Wallarah Coal Seam</i> .. . . .	5
Shales .. . . .	6
Conglomerates .. . . .	120
<i>Great Northern Seam</i> .. . . .	14
Tuffaceous shales (with fossil trees) .. . . .	80
Conglomerates .. . . .	45
Shales, sandstones, and cherts (quartz) .. . . .	54
<i>Upper Pilot Seam</i> .. . . .	8
Shales, tuffs, and cherts .. . . .	33
<i>Lower Pilot Seam</i> .. . . .	5
Conglomerates (with current bedding) .. . . .	200
<i>Cardiff Coal Seam</i> (with bands) .. . . .	16½
Shales, etc. .. . . .	30

*The Lower Set—*

<i>Burwood, or Victoria Tunnel, Coal Seam</i> .. . . .	13½
Shales and cherts .. . . .	65
<i>Nobbys Coal Seam</i> .. . . .	6
Shales .. . . .	40
<i>Dirty Coal Seam</i> .. . . .	7
Shales .. . . .	50
<i>Yard Coal Seam</i> .. . . .	3
Shale and sandstone .. . . .	200
<i>Borehole Coal Seam</i> (splits into two) .. . . .	6 to 20
Waratah sandstones .. . . .	30
Shales, etc. (with <i>two small seams, the Sandgate</i> ) .. . . .	170

Total thickness .. . . . 1221ft.

The most important of these seams is the Borehole, which varies in thickness from 4½ to 20 feet, and on which nineteen collieries have worked, sixteen of them still operating. The Borehole splits in places into two layers, separated in the Lake Macquarie district by some 60 feet of strata, the Upper known as the Young Walls-end seam. The two Pilot seams are not worked except where they merge into one another to form the Australasian, which in parts reaches a thickness of 50 feet—the thickest seam in the State. Only the lowest seven feet, however, are worked. All the other seams, except the Dirty, Yard and Sandgate seams, which in most places are streaked or too thin, are being exploited by some 33 collieries, big and small.

Historically the Newcastle measures were the first to be worked, and have been the chief factor in making Newcastle the second largest population centre in the

State. With the development of the Lower, or Greta, measures on the South Maitland field, however, the area around Newcastle, as far as its coal production is concerned, has become of secondary importance.

Immediately below the Newcastle measures lie the Dempsey beds of freshwater sandstones and sandy shales. They vary in thickness from 200 to 3000 feet. Although containing some very thin, useless seams of coal, they provide a solely geological interest. They immediately overlie, however, the shale, sandstone and conglomerate layers, which are streaked with bands of ironstone, and with valuable seams of coal. These layers, varying from 500 to 1800 feet in thickness, are known as the Middle, or Tomago, Coal Measures. The coal seams are found to protrude in a relatively narrow strip of country, running almost north and south, just east of a line linking Buttai, East Maitland and Morpeth.<sup>12</sup> The strata are distinguished as follows:—

*The Middle, or Tomago, Coal Measures.*

Stratum.	Feet
Four-Mile Creek Beds (near East Maitland)—	
Conglomerates . . . . .	20
Sandstone and shales . . . . .	58
<i>No. 1 Coal Seam (Top seam)</i> . . . . .	4½
Sandstones . . . . .	68
<i>No. 2 Coal Seam</i> . . . . .	7
Shales . . . . .	5
<i>No. 3 Coal Seam</i> . . . . .	6
Shales and sandstones (with 2 thin coal seams) . .	38
Buttai Beds—	
Sandstone and shales . . . . .	220
Rathluba Beds—	
<i>Rathluba Coal Seam</i> . . . . .	11
Shales, etc. . . . .	82
<i>Morpeth Coal Seam</i> . . . . .	4½ to 8
Shales, sandstones, etc. . . . .	94

In the vicinity of Singleton, at Rix's Creek and Ravensworth on the west, and about Westbrook and Glendonbrook on the east, numerous thick seams are found. It is still uncertain whether they should be regarded as being of the Newcastle or of the Tomago measures.<sup>13</sup>

Our third coal measure series—the Lower or Greta—is geologically much the oldest of the three. In the complete scale of the permo-carboniferous layers it is a

<sup>12</sup>. See Map No. 2.

<sup>13</sup>. According to Prof. David and Mr. C. A. Sussmilch.

comparatively insignificant stratum of from 150 to 300 feet thickness, made up of clay shales, sandstones, conglomerates, bands of ironstone, and coal seams. It lies between two great Marine beds of conglomerates, mudstones, sandstones and shales. (The Upper of these two Marine series has a thickness of from 5000 to 6400 feet, and the Lower of about 4800.) From an economic standpoint, however, this narrow measure has the greatest significance of any in the system, for here have been stored the most valuable deposits of first-grade coal to be found in Australia.

The Greta Measure contains only two really important seams, but they are both massive—the Homeville seam varying from 3 to 11 feet, the Greta from 14 to 32 feet thick. These are separated by about 50 feet of sandstone, conglomerate and shale, near the top of which is intercalated another narrow 3-foot seam of coal. In descending order the strata of these Lower measures would appear as follows:—

*The Lower, or Greta, Coal Measures.*

	Feet Thick
Sandstones and shales (with bands of conglomerate and sandstone).	
<i>Homeville Seam</i> (with base of kerosene shale, at South Greta) . . . . .	3 to 11
Sandstone, conglomerates and shale (with 3ft. seam near top) . . . . .	50
<i>Main Greta Seam</i> . . . . .	14 to 32
(In places passing into cannel coal and kerosene shale.)	

The cannel coal of the main seam is an extremely inflammable oil and gas producing variety. The presence of kerosene shale in both seams is noteworthy, even if for no other reason than that the coal areas at present being worked in the Hunter are almost entirely lacking in this valuable material. Kerosene shale is formed by the slow deposit of fine seed spores. It appears that not much is to be found in the Hunter strata, because the formation of the country did not permit the slow deposition of these spores apart from that of the vegetation which became coal.<sup>14</sup> True kerosene shale seems to be found only in the Greta measures.

“Although the Newcastle coal measures,” says Professor David, “are on the horizon for the Upper kerosene shale deposits of N.S.W., like those of Hartley, Joadja, Capertee, etc., no single instance has yet been met with,

14. Interview with Mr. J. Mitchell.

as far as I am aware, in this district, of the occurrence in them of anything approaching either cannel coal or kerosene shale. The so-called kerosene shale in some of the collieries of the Newcastle district is in reality a rather heavy splint coal."<sup>15</sup> Yet N.S.W., as a whole, has the largest kerosene shale deposits in the world. The richest areas are found in the Western Coalfield.

#### WHAT OF PETROLEUM?

What of petroleum in the Hunter River Valley? Considerable interest has been aroused recently by investigations in the vicinity of Greta and Lochinvar and on the Allyn River.<sup>16</sup> As most of the expert opinion to-day accepts the theory that petroleum is derived from either animal or vegetable matter, it is not unreasonable to expect its discovery among the *fossiliferous* strata of the permo-carboniferous formation. Yet although several shafts, some over 1000 feet deep, have been sunk near Maitland, no sign of oil has been seen, though free gas has been met. There appear to be reasons for believing that similar kinds of *vegetable* matter, under differing transformative conditions, may develop into either coal or mineral oil.<sup>17</sup> There is no direct evidence yet available pointing to such *oil*-producing conditions having existed in the Valley.

As the result, however, of the investigations of Dr. Arthur Wade, the Commonwealth Government, in August, 1925, undertook to subsidise the State or any private company, on the basis of pound for pound of actual expenditure on boring within the area of the Belford Dome, up to a maximum of £22,500. Yet investigations by officers of the N.S.W. Geological Survey have not provided convincing evidence of the existence of commercial oil or gas in the vicinity. The State Government has therefore declined itself to undertake commercial boring, but is issuing titles to prospect to a number of private enterprisers.<sup>18</sup>

#### THE QUALITIES OF COAL AVAILABLE.

The coal in all three fields of N.S.W. is bituminous, i.e., contains considerable quantities of hydro-carbons—

15. Memoir, p. 331.

16. The Hunter River Oil Co.'s holdings at Lochinvar, Allandale, Harper's Hill, and Farley to Sawyer's Gully, were on March, 16th, 1924, visited at the Company's request by Dr. F. G. Clapp, the world's most eminent oil geologist. 17. Presidential Address to Royal Society of N.S.W., 1924, by Mr. R. H. Cambage, F.L.S. 18. See official statement issued by Department of Mines, 30.10.25, and extract from Report of Government Geologist, Appendix No. 1, at end of chapter.

inflammable gases and oils. The most significant elements in any coal are its relative percentages of hydrocarbons (for gas and distillation by-products), fixed carbon (for coke), and ash content. Analyses of the coals of the State by the Mines Department show that those of the Northern field lead in big percentages of hydrocarbons, Greta seam having nearly twice that of Bulli on the Southern field. Average proximate analyses give Greta seam a percentage of 40.57, Borehole 34.98, Burwood 34.04, and Tomago 23.18; whereas both Lithgow of the Western field and Bulli of the Southern each show less, viz., 30.62 and 23.18 respectively, than the three main Northern seams.<sup>19</sup>

In percentages of fixed carbon, Bulli coal, with 65.21, is better than any on the Northern field, though Borehole with 54.77, Burwood with 53.60, Greta with 50.74, and Tomago with 51.79, all show high proportions. Hence the biggest number of coke ovens are to be found at work on the South Coast. Coke manufacture in the north is in the hands of the Broken Hill (Steel) Proprietary Coy., at Port Waratah, near Newcastle, and of two much smaller enterprises, the Purified Coal and Coke Coy., and the Wallsend Gas Coy., of Wallsend.<sup>20</sup> Using three batteries of 224 ovens, the B.H.P. Coy. produces 7000 tons of coke per week, for use in the smelting of iron ore. The coking coal employed is a mixture of 80 % Borehole seam, and 20 % Burwood—a mixture which cakes well for coking, because of its 51.62 % of fixed carbon and of its other qualities. It further provides 30.24 % of hydrocarbons for by-product treatment. The B.H.P. consumes no less than 16,500 tons of coal weekly, drawn from 25 collieries, all in the district. Greta coal, although possessing superior properties for by-product manufacture, is passed over in favour of the better coke-making mixture of Borehole and Burwood.<sup>21</sup> Even this mixture in the by-product type of coke ovens produces a coke rather too friable for other than short-distance carriage. At the B.H.P. this coke is passed direct from oven to furnace, over a distance of a few yards, thus requiring little handling, and suffering little breakage. At the Purified Coal and Coke Coy.'s works, Borehole

19. Chemists' and Analysts' Branch of N.S.W. Department of Mines (quoted in Mr. Cambage's Presidential Address *ibid.*). 20. The P.C. and C. Co. produces 18,000 tons per annum; the Newcastle Gas and Coke Co. produces annually 17,000 tons of a coke less suited for smelting purposes; the East and West Maitland Gasworks much less.

21. See Appendix No. 2 at end of chapter.

coal is roasted in open "bee-hive" ovens, after thorough washing, and produces a superior, hard coke, which can be transported long distances without breaking and crumbling.

*Greta* seam coal (or *Maitland* coal, as it is termed in commercial circles) is the best on the Northern field for gas-making. For that reason, it is used in the gas-producers of the steel industry, but is never employed in coke manufacture, for which it does not possess good caking properties. Being a light coal, it blazes fiercely, and has often to be "toned down" for bunker and other steam purposes. At the B.H.P. Steel Works, it is mixed with waste coke breeze. Up till recently the Railway Commissioners bought Borehole coal in the main for consumption in the district, but are now buying large quantities of *Maitland* coal—a fact involving need for greater care in the firing of engines. Practically the whole of the output of the mines around Muswellbrook (working the *Greta* seam, which there attains a probable thickness of 50 feet, and a small quantity of what is either the *Tomago* or *Newcastle* seam) are absorbed by the railways. For all-round purposes, *Maitland* coal receives more favour than any other. It is the best for export, despite its greater demand upon cargo space, for which it requires 47 or 48 cubic feet to the ton, as against *Borehole's* 44 and *Teralba's* (*Great Northern* seam) 42.

The coals from the *Tomago* measures are, on the other hand, mostly unsuited for export, because they break up so easily. Yet for blacksmithing, household, gas and local steam purposes, they find a market. They are inferior to other Northern coals in having a larger ash content—11.87 %, as against 6.73 % for *Greta*, 8.01 % for *Borehole*, and 9.93 % for *Burwood*. The lowness of ash content is perhaps the most desirable quality in a coal.

The *Newcastle* measures possess coals which, in the main, are hard, but not so firm as those of the *Greta* seams. *Greta* coal, having been formed much earlier than the *Newcastle*, has experienced the pressure of an additional 7000 or 8000 feet of rock. It is not certain whether the seams emerging around Singleton are of the *Newcastle* or *Tomago* series, but they are particularly good for metallurgical purposes and coking, though too friable for other than local use.

For heating purposes, the fourfold tests of the

B.H.P. Works prove coal from Aberdare Extended Colliery, on the Greta seam at Cessnock, to be much the best. Analysis shows it to possess 14,390 British Thermal Units. Jesmond Colliery, on the Borehole seam, renders 12,725 B.T.U., and the same seam at West Wallsend 12,685, and at Elermore Vale 12,384.<sup>22</sup>

#### THE QUANTITIES OF COAL AVAILABLE.

In a world whose methods of production are becoming increasingly dependent upon mechanical power, abundant supplies of coal-fuel must be counted among nature's most valued gifts to man. This will continue to remain true long after the world's supplies of free petroleum—the present formidable rival of coal—have vanished. In ever so many ways petroleum oil exhibits advantages over its competitor—in the cheapness and comparative ease of its extraction, in its portability, and, purely as a fuel, in the variety of its uses for land, sea and air. Ton for ton, oil is ever so much more productive than coal.

"The substitution of oil for coal on a particular ship," says Professor A. J. Sargent, "is purely a matter of relative cost at the moment. We are told that the saving, as compared with the cost of coal, ranges from 20 to 75 or 80 per cent. on that cost, according as we use oil for raising steam or in various types of internal combustion engine. There are gains in space, in wages, in bunkering time, and in convenience."<sup>23</sup>

But, since there is a strict limit upon the supply of oil, and the world's rate of consumption is outstripping its rate of production, the price of oil must inevitably go higher—thus giving coal a greater chance of competing both as a direct fuel and as a source of the oil-fuel which to-day can only economically compete with petroleum oils as a by-product in coke manufacture. The United States in 1918 produced 69 % of the world's total production of 514,729,000 barrels of petroleum; yet the American people possess within their home boundaries only one-seventh of the world's resources, of which, it is estimated, there remain some 60,000,000,000 barrels to

<sup>22</sup>. Figures supplied by Mr. R. Andrews, B.Sc., late of B.H.P. Benzol Plant. Mr. Andrews disagrees with the Mines Department's method of selection of coal samplings for test and the consequent results of analysis which gives Borehole a greater calorific value than Greta.

<sup>23</sup>. "Coal in International Trade," p. 71.



be taken.<sup>24</sup> Countries outside the U.S.A., says a report of the U.S. Geological Survey, "consume at the present time (1914) 2,000,000 barrels (of 42 gallons) a year; at this rate they have reserves for 250 years. The United States consume 400,000,000 barrels a year; they have only enough for 18 years."<sup>25</sup> The war tremendously stimulated the demand for oil, resulting in 1921 in almost double the consumption of 1914, with non-American countries producing, though not quite absorbing, 289,000,000 of the world's total of 759,000,000 barrels.<sup>26</sup>

These are truly amazing facts. Free well-oil, in the light of the world's fast increasing demands, must be counted a relatively short-lived source of motor fuel. Even though the number of uses of volatile oil continue to increase, the supremacy of coal seems to be assured for many centuries. The actual *burning* of coal, after all, is absurdly wasteful. Future generations will afford to smile indulgently when they contemplate our uses of the means of power. To them our point of maximum return will seem distantly remote from the one they will know; as remote, relatively, as the achievement of the wooden plough from that of its lineal descendant, the 110 horse-power, four-miles-per-hour, thirty-furrow, combined ploughing and furrowing machine of modern agriculture. The use of coal in the future will increasingly be by way of distillation; the important fact for our present purpose is that coal in vast quantities will continue to be used long after the disappearance of petroleum.

What, then, of the resources of coal?

The most recent estimate for Australia<sup>27</sup> places the total available commercial reserves of the Commonwealth at 34,585,000,000 tons, with another possible additional reserve of well over 114,000,000,000 tons, or a total of upwards of 150,000,000,000 tons. Enormous as this figure may seem, it represents but *one-fortieth* of the total possibly-workable coal reserves of the world.

Geologists estimate the world's total reserves at

<sup>24</sup>, <sup>25</sup> and <sup>26</sup>. P. L'E. de la Tramerye, "The World Struggle for Oil," 1921, Chapters II and III. Mr. Cambage quotes the world's output marketed in 1922 as 851,540,000 barrels, of which the U.S.A. produced 551,197,000. In 1922-23 Australia imported 74,000,000 gallons = 1,761,904 barrels. The world's estimated annual consumption to-day (1926) is well over 1,000,000,000 barrels, equivalent to 42,000,000,000 gallons, or 250,000,000 tons. Motor vehicles increased from 2,200,000 in 1914 to 24,564,000 in 1925.

<sup>27</sup>. By Mr. R. H. Cambage, F.L.S., in his Presidential Address to the Royal Society of N.S.W., 1924. No estimates have been made for the Northern Territory and Papua.

about seven million million tons. But as this figure includes very poor qualities, very thin seams, and seams below a depth of 6000 feet, it has little commercial significance. Indeed, coal cannot yet be mined satisfactorily below a depth of 4000 feet.<sup>28</sup> Estimates of resources, with existing limitations upon engineering, will, therefore, be useful for comparative purposes only if confined to commercial possibilities. Professor A. J. Sargent, for instance, estimates the world's workable reserves of true coal at four million million tons, to which should be added another three million million tons of brown coal of much less value—enough, altogether, to last the world upwards of three thousand years, at the present rate of consumption.<sup>29</sup>

Exhaustion does not threaten the world in general, but supplies of first grade coal in some countries,<sup>30</sup> e.g., the United Kingdom and the United States, are within measurable distance of depletion—a fact, by virtue of the law of diminishing returns, already adversely influencing coal prices in Britain. "In all cases," says Professor Sargent, "the estimated reserve of coal is considerably greater than the quantity which will ever be brought to the surface, owing to the waste, necessary and unnecessary, incidental to mining; but the comparative figures are not without significance, since the nearer any particular field approaches to exhaustion the higher is likely to be the cost per unit of coal raised."

The Australian one-fortieth of the world's total includes some 34,585,000,000<sup>31</sup> tons immediately workable reserve, of which 20,000,000,000 tons, or nearly two-thirds, lie within N.S.W. Of the N.S.W. supply, the Hunter River district can claim about 12,000,000,000 tons, i.e., about three-fifths of the State reserve, and more than one-third of that of the Commonwealth. Of course, the possible reserves, to be added to those immediately workable, are much greater — approximately 100,000,000,000 tons for N.S.W., of which some 60,000,000,000 may reasonably be claimed for the Hunter

28. The deepest mine in Australia—Balmain Colliery—has a depth of 2900 feet. 29. E. C. Eckel, in his "Coal, Iron and War," p. 112, estimates the world's distribution of workable coal as follows:—North America, 2260 thousand million tons; Asia, 1170 thousand million tons; Europe, 750 thousand million tons; Australasia, 135 thousand million tons; Africa, 55 thousand million tons; South America, 30 thousand million tons; whole world, 4400 thousand million tons. 30. A number of mines on the N.S.W. Borehole (A grade coal) seam have already been worked out and abandoned. 31. Inclusive of 10,475,000,000 tons of Victorian brown coal. Prof. David says that 34,585,000,000 tons is a conservative figure. He would use 70,000,000,000 as the basis of economic estimates.

River Valley. If an all-round price of £1 per ton at the pit's mouth be taken as a basis of valuation, and a wastage of 20 %<sup>32</sup> be allowed in the winning of the coal, *the enormous sum of £58,000,000,000 might safely be taken as roughly measuring, in present values, the worth of the Valley's coal store.* On Newcastle's 125th birthday (8th September, 1922), it was estimated that over 186,000,000 tons of coal, valued at £111,000,000, had already been won from the district.<sup>33</sup> From the Borehole seam alone some 115,000,000 tons had been extracted by the end of 1922.<sup>34</sup>

In what proportions, we may next ask, are the 12,000,000,000 tons of known workable reserves distributed among our three coal measures in the north? The recent estimate already used includes in the Northern field that part of the Upper Coal Measures which is being tapped at Curlewis (sixty-six miles by rail north-west of the Murrurundi edge of the Valley), a fact, however, which does not greatly affect the approximation. The most extensive available deposits belong to the Upper Coal Measures, with 9,081,200,000 tons about Newcastle (in which is included the Curlewis figure) and 480,000,000 about Muswellbrook (if it is not coal of the Middle Measures)—a total of 9,561,200,000 tons. In the 100 square miles at present being worked, within an area roughly seven miles south and fifteen miles west of Newcastle, there remain still 268,000,000 tons of coal, after allowing for the 115,000,000 tons already won, and 76,000,000 tons lost in mines already abandoned. This quantity should last at the present rate of output for another 200 years.

Professor Sir T. W. E. David, in 1907, estimated the unworked area of the Greta, or South Maitland, coal field as about 158 square miles, with a total quantity of 1,262,000,000 tons of unexploited coal—946,500,000 tons of large and 315,500,000 tons of small.<sup>35</sup> The total value of these quantities at the present rates of 25/- per ton for large and 19/6 per ton for small coal would be £1,490,737,500. A more recent estimate is that of Mr. J. T. Watson, who assumes an area of 100 square miles (excluding Greta measures to the north and west of the areas at present worked), with an average thickness of

<sup>32</sup> The actual percentage hitherto has been much greater—nearer 50 per cent. See paper read by Mr. J. T. Watson on "Waste of Coal," before Newcastle Branch of the Institution of Engineers. <sup>33</sup> "Newcastle Sun," 8th Sept., 1922. <sup>34</sup> Mr. Watson's paper, *ibid.* <sup>35</sup> *Memoir*, p. 305.

18 feet of accessible coal. Making allowance for unavoidable loss, and calculating on a basis of 100 tons per acre-inch, he estimates the existence of 1,382,400,000 tons—enough to last for 138 years at the present output rate of the State of 10,000,000 tons per year.<sup>34</sup> Mr. R. H. Cambage claims for the Maitland field approximately the same reserve—1,324,800,000 tons; and to the Muswellbrook area, he attributes 96,000,000 tons.<sup>36</sup>

The two latter estimates agree substantially with those of Professor David, who calculates that, after allowance for wastage, the Maitland field could alone meet the present rate of demand upon the State's supplies for another 124 years. The present exploitation of the South Maitland coal, however, is at the rate of about  $3\frac{3}{4}$  million tons annually. The life of the workable portion of the measures in this area will therefore probably be more than double the length of 124 years.

The collieries operating on the main Greta seam are found along the outcrop extending from Paxton to Maitland, a distance of about 23 miles. The seam dips on the whole at a comparatively low angle, admitting of the coal being worked to a maximum limit of 4000 feet as far south as Watigan Creek, about 16 miles south by west from Cessnock, and 6 miles south-east of Wollombi. "While, therefore," says Professor David, "it will probably be found impossible, on account of difficulties of ventilation, to work the coal at South Greta, East Greta, Heddon Greta, and Stanford Merthyr for more than about one mile in the direction of the dip, in the case of Pelaw Main the coal will lie within workable depths for about three miles to the south-east, and six miles to the south; at Hebburn the workable limit of 4000 feet extends probably for eight or nine miles to the south; at Abermain ten miles at least to the south of its outcrop; and at Cessnock probably to fully that distance to the south, possibly eleven miles. From the outcrop at Millfield, the workable Greta coal extends for perhaps eight miles to the south. It is obvious, therefore, that with seams with such magnificent thickness as the 30-foot seam of East Greta, and the 11-foot seam below it, and of such good quality for general purposes, there is a magnificent mass of fuel here in reserve, not only for present but for future generations; and in the near

36. Presidential Address, *ibid.*, p. 33.

future a far greater development of the coal mining industry may be anticipated, and *the South Maitland coal fields will consequently become one of the most densely-populated areas in N.S.W.*<sup>37</sup>

Reference has already been made to the probable great thickness of parts of the Greta seam at Muswellbrook. A 15-foot seam is already being worked in the town. About Leconfield, Branxton and Belford the same measures are workable for 4000 feet over an area of 30 square miles for a distance of from 3 to 4 miles south of the great northern railway. At Wingen, the Greta seam has been on fire for more than a thousand years.

The Middle or Tomago deposits, though usually regarded as of much less importance than the Upper or Lower, constitute no mean store of fuel. Some 345,600,000 tons of A grade and 702,700,000 tons of B grade coal, from seams totalling 18 feet thickness, are estimated to be accessible on the East Maitland and Rix's Creek fields.

The average total tonnage of coal won from N.S.W. mines during the decade 1914-24 was about 10,000,000. At this rate of output the gross reserves of the State should last 12,000 years. The output from the Northern district for the same period has been about 6¾ million tons, so that our gross supply of 72 million tons would conceivably last upwards of 5000 years. Confining ourselves, however, to immediately workable reserves (12,030,300,000 tons), from which the A grade coals (3,916,800,000 tons) are being rapidly taken, *the Hunter River Valley could continue to keep up the present rate of output for another 1700 years.*

The following tables will serve to show the relation of the Hunter River Valley coal resources to the wider aggregations of which they form part:—

*Commercially Accessible Coal.*

	Actual Known Reserves. Tons.	Total Possible Reserves. Tons.
The World . . . . .		4,000,000,000,000
Australia . . . . .	34,585,000,000	150,000,000,000
New South Wales . . . . .	20,000,000,000	120,000,000,000
Hunter River Valley . . . . .	12,000,000,000	72,000,000,000

37. Memoir, p. 306.

<i>Hunter River Valley.</i>	
<i>Upper Measures—</i>	
<i>Newcastle Coalfield (including Curlewis, outside the Valley)—</i>	
A Grade Coal .. . . . . . . . . . . . . . .	2,150,400,000 tons
B Grade Coal .. . . . . . . . . . . . . . .	2,630,400,000 "
C Grade Coal .. . . . . . . . . . . . . . .	4,300,400,000 "
<i>Muswellbrook Coalfield—</i>	
B Grade Coal .. . . . . . . . . . . . . . .	480,000,000 "
<i>Middle Measures—</i>	
<i>East Maitland Coalfield (including Rix's Creek)—</i>	
A Grade Coal .. . . . . . . . . . . . . . .	845,600,000 tons
B Grade Coal .. . . . . . . . . . . . . . .	702,700,000 "
<i>Lower Measures—</i>	
<i>Maitland Coalfields—</i>	
A Grade Coal .. . . . . . . . . . . . . . .	1,324,800,000 "
<i>Muswellbrook Coalfield—</i>	
A Grade Coal .. . . . . . . . . . . . . . .	96,000,000 "
<i>Totals—</i>	
A Grade Coal .. . . . . . . . . . . . . . .	3,916,000,000 "
B Grade Coal .. . . . . . . . . . . . . . .	3,813,100,000 "
C Grade Coal .. . . . . . . . . . . . . . .	4,300,000,000 "
<i>Total, All Grades .. . . . . . . . . . . . . . .</i>	<u>12,030,300,000 "</u>

In the second table<sup>88</sup> (from the estimate of the officers of the N.S.W. Geological Survey), A grade coals are those of first quality, suitable for steam raising, gas making, and household purposes, with ash content from 5 % to 12 %; B grade, coals with lower calorific value and higher ash content than Grade A, but suitable for use in the condition as mined, ash averaging from 12 % to 20 %; C grade, coals from inferior seams generally with high ash content, but suitable for use after washing or flotation.

#### CAPACITY FOR OIL PRODUCTION.

This section of the chapter, treating of coal quantities, began with a discussion of the present importance of motor oils. Our general analysis of the economic significance of the Hunter River geology may well conclude with a brief reference to the Valley's capacity to meet oil needs.

Of the existence of supplies of free petroleum there is yet no strongly convincing evidence. What, then, of resources of suitable coal for distillation treatment?

<sup>88</sup> Quoted in Mr. Cambage's address and N.S.W. Mines Department's Bulletin No. 6.

Greta seam coal is rich in hydro-carbons. The output of this coal for 1923 was a little more than  $3\frac{3}{4}$  million tons. On the assumption that one ton of coal will produce 10 gallons of motor spirit, the treatment of  $3\frac{1}{2}$  million tons of coal would be required to meet the present consumption of motor spirit in Australia. Thus the existing output of Greta coal could satisfy our present oil needs. Did the necessary distillation plants exist to treat this large quantity of coal, there could be obtained, in addition to the motor spirit, about 350,000 tons of heavy liquid fuel, or alternatively, 175,000 tons of Diesel oil, and the same weight of pitch. A solid smokeless fuel of about  $2\frac{1}{4}$  million tons and four times the volume of gas at present consumed in Sydney would also be in the gift of the distillation process.<sup>39</sup> The coal is there, and the demand for oil is insistent. But, apart from the extraction of coal-derivatives as a by-product process associated with some major industry, already being successfully achieved in steel production in the Hunter River Valley, coal oil cannot yet be produced economically to compete with the easily gathered fruit of dame Nature's modern horn of plenty—the petroleum well.

Mr. R. H. Cambage, assuming that one ton of coal will produce, among other things, 2 gallons of light oils and about 8 gallons of tar from which other oils are obtained, estimates Australia's workable coal supply of 35,000,000,000 tons<sup>40</sup> to be capable of yielding 69,000,000,000 gallons of the light oils. Assuming each ton to give 10 gallons of various oils, the possible reserve of oil from this coal supply is nearer 345,000,000,000 gallons. Proportionately, the *Hunter River Valley coals could probably yield 120,000,000,000 gallons, that is, one-twenty-first part of the world's existing supplies of free petroleum.*

### SUMMARY.

The exhaustive analyses of our second chapter have been intended to reveal the economic importance of the substance or geology, as distinct from the shape or topography, of the Hunter River Valley. This has involved

39. Bulletin No. 24. Commonwealth Institute of Science and Industry, 1923. 40. Prof. David, in his evidence before the Federal Parliamentary Joint Committee of Public Accounts, used 70,000,000,000 tons, on the assumption that Mr. Cambage's 35,000,000,000 was a very conservative estimate.

description and enquiry into the significance of geological features (1) on the surface and (2) below the surface of the country under examination. It was noted first that the largest area of good soils is a tract of decomposing basalt in the north-west quarter of the Valley, but that its value for cultivation purposes is discounted by low rainfall. The area south of the main river stream stretching along almost the entire length of the southern walls was seen to be a poor sandstone tract, where nature gives but niggard assistance to the farmer. On the north-east the surface outcropping is chiefly of poor clay, and mudstone, but economically the region is rich, because of the saving presence of mountain and hill-top basalt patches, which are washed by the rains to provide the silts for the cultivation farms.

Wedged in between these broad tracts, which are the exposed work of three distinct geological ages, is the outcropping of the coal measure country. We have seen that the coal measures penetrate beneath our basalt and sandstone regions, but the coal itself is most accessible in the areas of the outcrop of the permo-carboniferous rocks. Analysis of the permo-carboniferous system and of the effects upon it of the earth's movements, and of weathering, has shown the coal to be found in three separate series of strata, known as (1) the Upper or Newcastle measures, (2) the Middle, Tomago or East Maitland measures, and (3) the Lower or Greta measures, each of which is composed of a number of coal seams of varying thickness, inter-stratified with other substances. Our analysis revealed little satisfactory evidence of the presence of mineral oil in the district.

We were next led to consider the coal resources of the Valley in respect of (1) quality and (2) quantity. Analyses of the coals from the various seams of the different fields show them to be suited in different degrees for different economic purposes, a number of those from the Upper measures being suited specially for steam, coke-making and export, those from the Lower for steam, gas-making and export, and those from the Middle for use in local households and smithies. It follows that the varieties of quality in Hunter River coals are equal to the widest demands of industry. In the matter of quantity, the Valley possesses such vast immediately workable deposits that even with a greatly increased rate of winning there need be no fears of exhaustion for centuries, except for the cheaply-extracted first grade coals,



which are being wastefully removed at an all-too-rapid rate. The chapter concluded with a brief enquiry into the capacity of the Hunter River coals, more especially those from the Lower measures, to meet requirements in oil production. It was recognised that coal-oil production, as an independent enterprise, is uneconomic under present conditions of competition with petroleum oil, but that the estimated quantities of Hunter River coal, rich in hydro-carbons and likely to last for centuries, will be an immensely valuable asset as an oil reserve in a not very remote future.

#### APPENDIX NO. 1.

*A.—Official Statement by N.S.W. Mines Dept., 30th Oct., 1925.*

#### PROSPECTING FOR OIL AND GAS IN THE SINGLETON DISTRICT.

Applications have been made recently to the Department of Mines by various companies to prospect for oil and gas within the Singleton District. The sites chosen by these companies comprise the geological structures known as the Belford, Loder, and Sedgefield, Domes. The Belford Dome lies about seven miles easterly from Singleton, and is about eight to ten miles in length, with a width of three to five miles. The Sedgefield structure adjoins Singleton to the east and north-east, and is about as large as the Belford Dome; while the Loder Dome lies immediately to the south-west of Singleton, and is about six miles in length, and about one and a-half miles in width.

The important conditions which are necessary for the accumulation of commercial deposits of natural oil or gas may be summarised as:—

- (1) A source, presumably organic, from which oil may be obtained.
- (2) Porous, jointed, or cavernous rocks, within which oil may be stored.
- (3) An impervious cover, whereby the escape of the oil and gas may be prevented.
- (4) A suitable geological structure, permitting of local concentration of the oil and gas into commercial pools.

The dome or arched structure in which the rocks are bent into a form similar to that of a

gigantic inverted basin affords an ideal structure for such concentration. Not all the productive wells in the world are located within "domes," but in new country it is advisable to locate the most favourable structures for prospecting.

The Belford, Sedgefield, and Loder Domes are suitable geological structures. The rocks composing these domes contain abundant remains of ancient land and marine organisms. The coal seams in the structures represent vast accumulations of land plants, and these are both overlain and underlain by beds of fossil shells.

The upper portions of the "domes" under consideration have been denuded or stripped considerably. Boring in the Belford area has proved the existence of the Greta Coal Seam at a distance from the surface of 1,400 to 1,500 feet, and it has been estimated by the Broken Hill Proprietary Collieries Ltd. that the Greta Seam lies at a depth from the surface not exceeding one thousand feet. The Sedgefield and Loder Domes have suffered less denudation than the Belford Dome.

The investigations by the officers of the Geological Survey of the Department of Mines have failed so far to disclose any definite indication of the existence of commercial pools of natural oil or gas below the surface.

With this information before it, coupled with the absence of any official records of surface indications of oil pools in Eastern Australia generally, the Prospecting Board has not been able to see its way to recommend the Minister for Mines to undertake the prospecting work outlined by Dr. Wade in his report to the Commonwealth, and considers that this work might well be left to private enterprise, with such assistance as the Federal Government, under the terms of its proposals, may be prepared to give.

B.—*Extract from Report of Government Geologist (Mr. E. C. Andrews) for 1925.*

#### OIL-BORING IN THE SINGLETON DISTRICT.

"It is impossible to state definitely that oil and gas in quantities sufficient to justify the expenditure of a very great amount of capital in prospecting for the same may not be discovered in the area under consideration. Nevertheless, it appears advisable to reason from the

known to the unknown in this as in other economic proposals. After a careful examination of the structures in the field, and after a search through the literature available, *I am of the opinion that there is nothing in the nature of evidence to justify a belief in the existence of commercial supplies of oil or gas in the domes under consideration.*"

"In recognition, however, of the extreme importance to the State in possessing oil supplies, it may be advisable to make very liberal concessions to bona-fide companies over these dome areas, because of the enormous risks involved in these pioneer attempts at prospecting for oil and gas."

APPENDIX No. 2.

COMPARISON OF BOREHOLE AND GRETA COALS FOR BY-PRODUCTS MANUFACTURE.

		<i>Per Ton of Coal.</i>	
		Borehole.	Greta.
Coke . . . .	12 cwts.		10 cwts.
Sulphate of Ammonia .	23 lbs.		26.7 lbs.
Tar and Pitch	7 gallons		11.4 gallons
Heavy Fuel Oil . . . .			2.5 gallons
Creosote Oil .			2 gallons
Benzol . . . .	2 gallons		.9 lbs.
Solvent Naphtha . . . .	0.14 gallons		.5 lbs.
Nut Breeze . .	40 lbs. Used as blast furnace fuel		
Fine Breeze .	160 lbs. Burnt under boilers		
Gas . . . .	11,500 cu. feet. After being stripped of its by-products, 60 % of this is required for heating the ovens, leaving 40 % available for industrial heating		Between 11,000 and 13,000 cu. feet, obtained by destructive distillation

These analyses show the superiority of Borehole seam coal for coke-making in quantitative result (apart from its better caking properties), and the superiority of Greta seam coal for general by-product purposes.

30 A STUDY IN SOCIAL ECONOMICS

*Average Analysis of B.H.P. Crude Tar.*

Distillation		
Constituent.	Temperature.	Percentage.
Light Oil ..	0—170 deg. C	2.35 %
Middle Oil .	170—230deg. C.	10.11 %
Heavy Oil ..	230—270 deg. C	11.15 %
		=25 % of this fraction or 5.31 % of tar
Anthracine		
Oil . . . .	270—400 deg. C.	18.8 %
Hard Pitch		53.59 %
Water . . .		4.0 %

These analyses are adapted from tables in the Presidential Address to the Royal Society of N.S.W., 1924, by Mr. R. H. Cambridge, F.L.S., late Under-Secretary for Mines.

### CHAPTER III.

## THE POSITION OF THE VALLEY

### ECONOMIC IMPORTANCE OF GEOGRAPHY.

Geography is concerned essentially with the relation of place to place and with the identities, similarities and differences arising out of that relationship. Geography has always been a far-reaching control upon the history of communities. The position on the earth's surface of any community is obviously the prime circumstance to which it must adapt itself. Specific attractions in locality have again and again been responsible for the arrest of nomadism in primitive communities, and have evoked the differentiation of labor, which we call civilisation.

It is of particular interest to us to recall that civilisation was cradled along river valleys. Indeed, if the thesis of Professor G. Elliot Smith be correct, an unbroken chain of relationship links the commonest practices of our own culture with the steps first taken by humanity in the ordered harnessing of energy. This began when the peoples of the Nile, nurtured and taught by the omnipresent gifts of their god-river, learned the art of irrigation from the seasonal suggestion of the flood. The history of human life in Egypt has been the story of the adaptation of successive peoples to the demands of geography.

To make too serious a comparison between the Hunter River of N.S.W. and the mighty streams which in other lands have guaranteed the food supply and borne the traffic of vast populations would perhaps betray the lack of a sense of proportion. Reference, however, to the environmental facts which have controlled the life of other valley communities will at least throw into relief the geographical controls which are significant for our own Valley.

Egypt is properly a sinuous ten-mile-wide thread of fertile valley along the banks of the Nile, over a distance of about 700 miles, together with the Delta at its mouth. This ribbon of country has been cut by the river through the surrounding tract of limestone, and filled with a rich alluvium brought down seasonally by the floods. The Nile draws its abundant waters from

two sources—one a region of regular equatorial rain, and the other (the highlands of Abyssinia) a land of seasonal deluges in late spring and early summer. The upper reaches of the river pass through sandstone and hard rock, which do not lend themselves to the formation of flood-plains, even ten miles wide. The desert here encroaches to within a few yards of the banks of the river gorge. Shut off by all but impassable wilderness on both sides, the great river has for ages been both highway and food-producer for its peoples, who, in the utter absence of local rainfall, but with warm and genial sunshine, have enjoyed a land which they need but “tickle with a hoe” to make it “laugh with a harvest.”

Here we have a region exhibiting entirely opposite geographical features within the same compass — perennially abundant water under rainless skies. There is a mildly comparable juxtaposition of opposites in the Hunter River Valley. It is so shaped as to share over two distinguishable halves of its area the distinctive climatic experiences of the coastal and middle-west belts on the central latitudes (31 to 33 degrees South) of N.S.W. The temperature of Newcastle, in the more humid half, tempered by its sea-board location, ranges between 38.8 degrees minimum and 100 degrees maximum, with an average of 65.5, and its average rainfall is 46 inches. Cassilis, at the extreme west of the Valley, experiences variations from intenser heat to intenser cold, with the dryness usual to a “continental” climate, and its average rainfall, 23 inches, is just half that of Newcastle. This is one interesting peculiarity which distinguishes the Hunter from other river basins around the Australian coastline.

With the greater river systems of the world — the Danube, Yangtze, Mississippi, Amazon, etc., including our own inland river basins—the Hunter is, of course, scarcely comparable at all. In respect of actual and navigable length the river merits less attention than others on the N.S.W. coast. Forty miles from the sea-board, the Clarence is a noble stream, upwards of half a mile wide, bearing the traffic of ocean-going steamers and sailing vessels; the Hunter, at an equal distance from its mouth, is little more than a big creek a hundred yards or so in width. Hence the limited use of navigable waterways enjoyed by the Hunter River people. A few ocean-going vessels may on the main stream ply as far

as Morpeth, which at one time was the terminal port of the Hunter, more important than Newcastle itself.<sup>1</sup> But Morpeth is but a few miles inland, though some forty by winding river route. On the Williams and Paterson, the larger launches do not go beyond Clarence Town and Paterson.

Swiftly rising floods are the common experience of most coastal river regions, and the Hunter is no exception. Like other coastal streams, it is relatively short and fast-flowing, yet incapable of carrying away between its banks the surplus volumes of water which periodically pour down from the mountains and hills of its upper and middle reaches. Hence the frequent inundations of many square miles of the adjacent lower-lying country. Beneficent though the seasonal flood be, the farmer is never sure of its unqualified friendliness. On several notable occasions floods have been most disastrous in the Maitland district. The earliest settlers were taught the costly lesson of site selection as far back as 1820, when the river rose 37 feet above high-water mark. There were again great floods in 1864 and 1867, when some 35,000 acres of land were covered with water, inflicting a loss of £150,000 upon the district, and rendering destitute some 400 families. But the most disastrous flood of all occurred in 1893. Heavy rains caused a sudden and simultaneous flooding of the tributaries on both upper and middle reaches, with the result that most of the flat country between West Maitland and Newcastle was changed for months into an inland sea, with the destruction of many thousands of pounds' worth of property, and the cutting of all rail and road communication. Obviously, then, for weal or woe, the Hunter River people are, in this respect, subject to the uncertainties of geographical control.<sup>1a</sup>

#### SEA-BORDERING COAL FIELDS.

Geography has further already asserted its directive influence upon the economic life of the Hunter by inducing the growth of important manufacturing industries and a virile commerce. The proximity of coal to

1. "It is significant that the first line to Morpeth ran in from the West Maitland end, showing that the traffic was from that side. In fact, it was the railway and big ships that killed the town, the former by carrying the trade past, and the latter by not being able to get up in sufficient numbers to pick up the trade."—Communication to writer from Mr. R. F. Wylie, of the editorial staff of "The Staff," of the Railway Department.

1a. Exceptionally heavy rains falling over the whole of the watershed of the Hunter and its tributaries in the last days of December, 1926, have given the Valley the latest of its major experiences of damaging floods, more especially in Cessnock, the Maitlands and Newcastle.

the sea is the geographical fact of utmost significance. Coal is a heavy and costly material to transport by land. Ton for ton it is cheaper to rail most of the products whose manufacture involves the use of coal than to rail coal itself. Moreover, the greater the distance carried, the greater the loss of combustible properties. There is an inevitable tendency, therefore, for manufacturers to bring other raw materials and plant to the place where coal is found rather than to take coal to distant centres of manufacture. This is a universal experience. The tendency is only offset when cheap waterway transport is available to counter the disadvantages of costlier carriage by rail.

Now it is to be observed that the Hunter River geography is producing both this tendency and its offset. The outstanding manufacture in Newcastle is that of iron and steel. The ore for this great industry is brought 1,200 miles by sea from South Australia. There is no commercially workable ironstone in the Hunter district, which, from the viewpoint of extractive industry, is, except for the quarrying of gravel, blue metal and clay shales, purely a coal-bearing region. But a thousand manufactures will spring up about a purely coal-producing field for every one about a field devoted purely to the extraction of iron ore. There are, therefore, a thousand business reasons for confining the manufacture of iron and steel to the coal field, with its promise of manifold industry, in preference to the relative isolation of the ore field. On the other hand, the comparative slowness of growth of manufacturing industry generally about Newcastle has been due to the cheapness of sea transport of coal to the factories of the metropolis; for Sydney lies only 60 miles by sea south of Nobbys. The basic advantage of easily accessible coal possession, however, is certain eventually to give the industrial victory to the Hunter, until such time as cheaply produced electric power at the coal-face is conducted and sold cheaply to industrial consumers in the metropolis.

The three great surplus-producing coal regions of the world are the United Kingdom, the United States, and Germany. In 1913, the U.K.<sup>2</sup> raised 287,000,000 tons, and exported 76,688,000; the U.S.A. raised 510,000,000 tons, and exported 20,000,000, and Germany<sup>3</sup> raised

<sup>2</sup> In 1924, the U.K., by raising 274,800,000 tons and exporting 62,000,000 tons, had almost regained its pre-war level of activity. 1925 saw a heavy slump. <sup>3</sup> Germany can still produce a surplus above her own industrial requirements despite her virtual dismemberment under the Versailles Treaty.



188,000,000 and exported 25,000,000. Thus Britain was the greatest exporter, and the United States the greatest producer, country. Against these figures the Australian output in 1924 of 13,757,500 tons, of which about 2,000,000 were exported, looks very small. The significant fact, however, is that Australia (which means N.S.W., and, more precisely, mainly the Hunter River district) is already a surplus country, whose small trickle of coal export might, under favourable conditions, expand into a great stream comparable with those of its mightier rivals.

Now, geographical location is a factor of the utmost importance to countries dependent upon an export trade in coal. Under existing international competitive conditions, how far a particular coal output will be maintained is determined by relative costs to the consumer. And the accessibility of the coal to its market is a prime factor in cost.

Some coal exporting countries, notably the U.S.A., are able to offset the disability of distance from markets by at least equivalent advantages from other factors in cost reduction. Up till the outbreak of the War, American fields had practically only one export market—Canada—across a land frontier. The great bulk of the American output, of course, is absorbed on a vast home market, for which transport charges, even on the railways, are kept low by river-barge towage and lake shipping. But for her export trade to countries other than Canada, America has been hindered rather than helped by her geographical position. The exporting mines are 350 miles' distance from the coast. The colliery companies, however, have been able to offset this handicap by the advantages of easily machined, thick bituminous deposits worked by tunnels and shallow borings alongside navigable waterways. These advantages during and immediately after the War were so substantial that American coal was, by 1920, being shipped to European ports (mainly Scandinavian and Italian) at the rate of 14,000,000 tons, and to South American (mainly Brazilian and Chilean) at the rate of 3,500,000 tons a year—markets hitherto almost solely British. But by 1923, Britain had again recovered this trade temporarily lost to the Americans.<sup>4</sup>

The United Kingdom has always had the Atlantic

<sup>4</sup> Total British output in 1923 had recovered approximately to its 1913 level; for 1924 it was rather less, and in 1925 still less.

as its ally in competition with American coal, particularly for the European trade. Britain is very close, by short sea routes, to many European deficit countries. She has even been able to export as much as 9,000,000 tons annually to Germany by way of Hamburg, the Baltic ports, and along the Rhine, and to meet the competition of Westphalian coal, which has largely to be trucked. Because also of the distance inland of the German fields, British coal gets the bulk of the Scandinavian trade. German freight rates, however, are not so high that they greatly hamper the movement of coal, mainly because State ownership, and therefore policy and management, of railways and canals has made transport actually subservient to the ends of industrial production, not primarily a scope for profit-making. In Germany, "the railways are made real servants."<sup>5</sup> Nevertheless, the advantage of geographical position lies decidedly with the British mines.

Coal from the Commonwealth has, as yet, hardly entered the arena of international competition. N.S.W. in 1925 absorbed more than half of its own output, sent upwards of another quarter to the other States, and shipped a little less overseas.<sup>6</sup> Not quite three-quarters of the State output was raised on the northern fields. Of the northern tonnage, between one-sixth and one-fifth went abroad, and the remainder was divided almost equally between N.S.W., and the other States of the Commonwealth. Apart from the very rare arrival of a ship "bringing coals to Newcastle"—a not unknown occurrence—there is no importation of overseas coal into Australia. The Commonwealth stands sufficiently remote from other surplus countries to enjoy immunity from competition on her own market. On the other hand, our relative closeness to the East gives us certain important advantages of accessibility, particularly in the East Indies. We have, however, a mighty, potential rival in China, whose vast coal resources have, as yet, been almost untouched. But here, again, we are at least temporarily advantaged by geographical conditions. Though easily accessible to the surface, most of China's coal lies well inland. Only the cheapness of her abundant labour

5. Quoted from the U.S. Industrial Commission in McVey, "Modern Industrialism," p. 76. 6. 1925—

	Tonnage Raised.	Used in N.S.W.	Sent to. Other States.	Export Overseas.
N.S.W. . . . .	11,396,199	6,625,161	3,001,823	1,769,315
H.R.V. . . . .	7,637,953	3,463,553	2,778,124	1,396,276

supply can at present balance the scales against this handicap, and our own up-to-date machine-methods of winning coal.<sup>7</sup>

### SUMMARY.

Our third chapter has stressed the importance to its economic life of the geographical position of the Hunter River Valley. After a brief general discussion of the nature of geographical controls (the Nile Valley being used for illustration), it has been shown how the latitude and coastal position of the Valley have combined with its topography to produce the two juxtaposed climates and their predominant types of rural industry, and to subject the farmers and river townfolk to the uncertainties of swift-rising floods. The chief significance of the Hunter's geography, however, has been shown to lie in the proximity of its coal deposits to the sea. This has led us into a discussion of the economics of transport. It has been shown that the easy accessibility of the coal to the sea-board has produced two mutually opposing tendencies—(1) for the coal to draw to its own neighbourhood the raw materials and equipment of manufactural industries, and (2) for the coal to flow by cheap sea-routes to established centres of manufacture elsewhere. The first tendency is illustrated on a big scale by the establishment at Newcastle of a great iron and steel industry, drawing its iron ores from South Australia, and its other metalliferous raw materials from a distance; and the second tendency by the large shipments of coal to Sydney and elsewhere. Finally, as the Hunter River district exports about one-quarter of its coal output, we have been led to discuss the advantages which geographical position has given it in (1) immunity from foreign competition on Australian territory, and (2) accessibility to the Far Eastern markets for the output producible above Australian requirements—the discussion involving a consideration of the geographical problems faced by the United States, Great Britain and Germany, the three great surplus-producing coal countries of the world.

7. It would be a mistake to overestimate this temporary advantage to Australia. Already in China mining is being conducted within relatively cheap reach of the coast, on a scale surpassing anything in Australia; e.g., the mines of the Anglo-Chinese Kailan Mining Administration, which produce high-grade bituminous and coking coals for the whole Far Eastern market, rail their produce to the deep-sea port of Chingwangtoo, on the Gulf of Pe-Chi-Li, only 80 miles away. The mines are equipped throughout with electrical machinery of the most modern type, with mechanical stoking in general use at the power stations. The aggregate daily output of the five mines is over 20,000 tons, one mine alone, the Chao Ko Chwang, raising up to 6500 tons daily—an amount greater than that of any mine outside America! Mechanical loading devices, however, cannot yet compete with manual labour in Chinese ports. (From publication of the Kailan Mining Administration, Tientsin.)

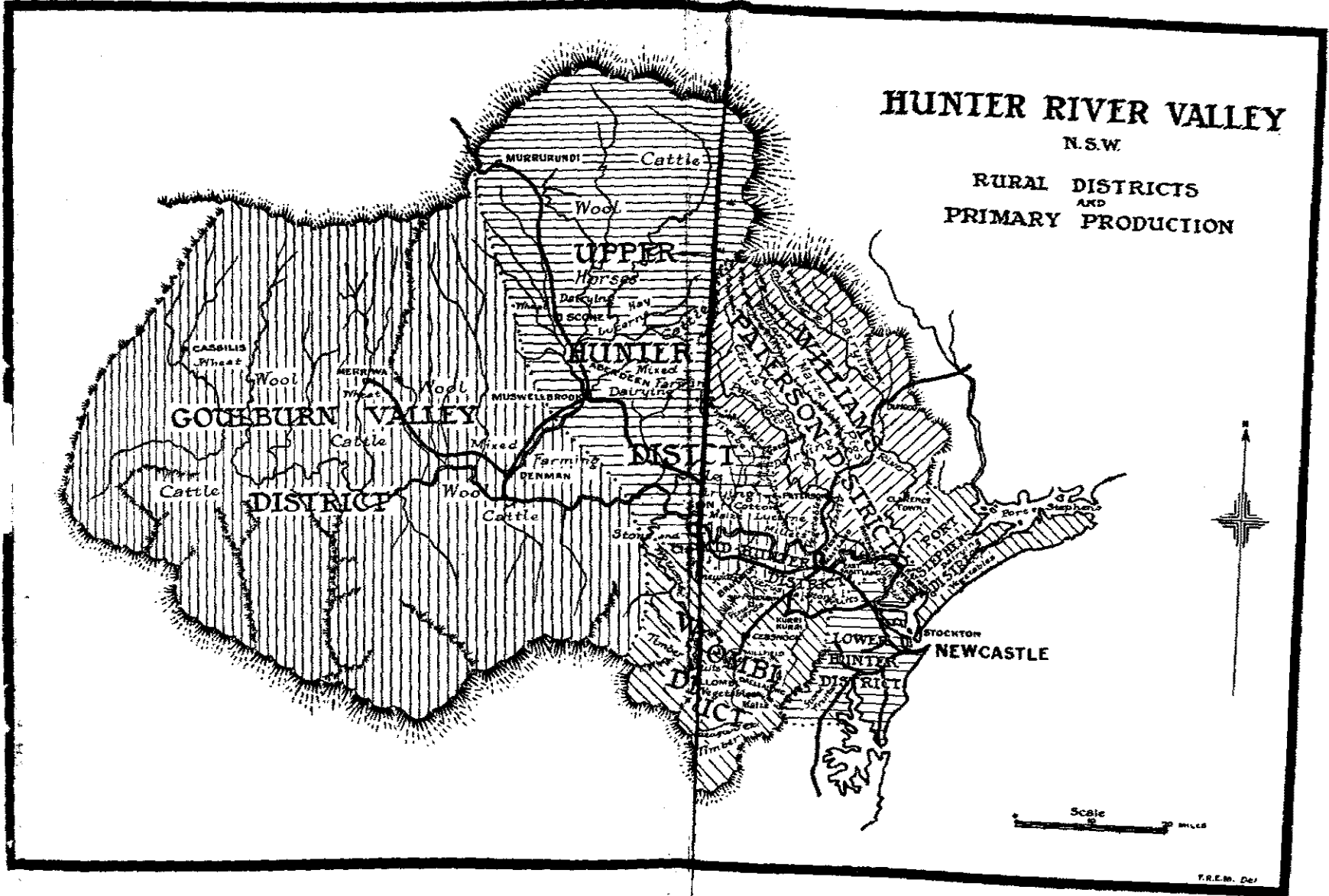
## CHAPTER IV. LIVELIHOOD FROM THE LAND

### PRIMARY INDUSTRY IN THE VALLEY.

The foregoing enquiry into the physiography of the Hunter has given us a broad three-fold classification of the material resources upon which all our economic activities are based. To ignore the inter-relatedness of the many forms of these activities for the sake of simplicity of classification would, of course, be to follow the dangerous precedent of all too many "special pleaders" on the field of sociological enquiry. All forms of livelihood-getting in the Hunter Valley, as elsewhere, are becoming more and more mutually dependent. We cannot, for instance, intelligently discuss the changes in farming on the Mid-Hunter without considering the new demands created by a fast growing mining population on the South Maitland field, and of an increasing workshop and business population about the port of Newcastle. The life of any modern community is compacted of innumerable interwoven activities, each conditioning the continuance of every other. Bearing constantly in mind, therefore, this "bond of unity" (which it is the business of economic science to enable us to perceive in the sprawling complexity about us), we may turn to the use of classification guardedly and with reserve.

There is a broad correspondence between the three aspects of the Hunter's physiography and the three types of industry<sup>1</sup> productive in the sense that they are concerned with the transformation of raw materials into commodities. To the Valley's topography in the main are attributable its primary activities—the cultivation of plant and animal life; to its geology the great extractive industry of coal production, with the minor activity of quarrying; and to its geography all forms of secondary, manufacturing industry. Transport and commerce, being essentially concerned with the movement of goods, are the pervasive services which ensure the counter-flow of demand and supply between the individual enterprises in these several broad industrial spheres. Following the order of treatment of the three basic physical controls,

1. See Chart of Contents facing Introduction.



we shall now turn to a consideration of the primary, extractive and manufacturing industries, to be followed by an enquiry into the facilities which our commercial and transport arrangements provide as services to these industries.

First, then, as to primary industry.

The Hunter River region may conveniently be classified into seven rural areas<sup>2</sup>—the area of the Goulburn Valley, the Upper Hunter, the Mid-Hunter, the Lower Hunter, the Paterson-Williams district, the Wollombi district, and the district south of Port Stephens. There is little correspondence between these areas in size, and, although certain forms of farming are common to them all, they each have some one or more characteristic giving them a separate identity. Let us turn to each briefly.

#### THE GOULBURN VALLEY DISTRICT.

The area embraced within the Goulburn Valley district is by far the largest of all seven. It comprises almost the whole western half of the Hunter basin, and therefore corresponds almost entirely with the area within the salient, which marks the intrusion of the climatic conditions of the middle-west.<sup>3</sup> It will be remembered that an average rainfall of over 25 inches annually descends upon the spurs and foothills along the mountain boundaries both north and south of the Goulburn, but it is precisely because of the uselessness of this boulder-strewn country (except for the washing down of the basalt soil on the north) that these relatively generous falls are wasted. It will further be recalled that the northern tributaries of the Goulburn flow through a country of decomposed basalt, which is divided from the sandstone country of the southern tributaries by a narrow strip of coal-measure outcrop along the main stream.<sup>4</sup>

Now, as might readily be inferred, the advantages for a farming community lie decidedly with the northern half of the area, with its rich basaltic soils. But important as soils are for agriculture, rainfall is still more important. It so happens that, although wheat is grown for ensilage and conserved in pits about Cassilis and Merriwa, the basaltic soil is really too heavy for wheat-growing, despite excellent rainfall and general climatic

2. See Map of Rural Areas. Map No. 3.

3. See topographical map (No. 1). 4. See map of geological features (No. 2).

conditions for this cereal. It is not really good wheat country, despite the moderate success attending its use for that purpose. If, on the other hand, rainfall were better or irrigation were possible, the northern half of the Goulburn River district would more than rival other parts of the Hunter basin in the abundance of varied crop production. As it is, it is a country of sheep and cattle grazing, except chiefly for the mixed farming area, of which Denman, with its (co-operative) dairy factory, producing from 3 to 18 tons of butter weekly, or upwards of 380 tons yearly,<sup>5</sup> is the centre. Even at Denman, at the junction of the Upper Hunter and the Goulburn, there are large sheep and cattle stations.<sup>6</sup> Grazing, in contradistinction to agriculture, always involves comparatively big holdings. Big estates are the characteristic of the Goulburn district. There are some very large private stations in the vicinity of Merriwa and Cassilis, and from them wool of the finest grade is produced.<sup>7</sup>

#### THE UPPER-HUNTER DISTRICT.

The Upper-Hunter district is made up of an extensive tract of relatively inferior mountainous country about the sources of the river and its feeders, together with three much richer areas, stretching from eight to ten miles on each side of the great northern railway, known respectively as the Scone-Murrurundi, Muswellbrook-Aberdeen, and Singleton districts.

The rugged country of the upper reaches is mostly of a claystone surface, unsuited to agriculture or mixed farming. It is used extensively, however, for pasture—sheep in the valleys and cattle on the hills.

Scone is the centre of a great area, with odd villages scattered here and there, first settled in the early thirties. It is essentially a district of big estates—one immense holding<sup>8</sup> having been until quite recently about 40 miles in length and about 8 wide, with the Hunter flowing through the centre—which, however, are gradually being broken up. The big stations, of course, stand pre-eminently for wool-production and cattle-raising, some being noted for their blood horse studs. Nevertheless, there is some mixed farming, hay crops, and a little wheat being

5. Figures supplied by manager, Denman Dairy Co. Ltd. The company, in June, 1936, decided not to register under the Co-operation, Community Settlement and Credit Act 1933, and was therefore obliged to delete the word "Co-operative" from its name. 6. Notably, until recently, the Whites, at Merton. 7. One of the largest, Bettington's, in 1923, had a wool clip of 2000 bales, worth £40 per bale.

8. The Whites, of Belltrees. Other big holdings are those of the Cocks, of Turanville, and the Semples, of Segenhos.

grown on the hills and lucerne (with the aid of irrigation) on the high banks of the streams, together with sufficient dairying to maintain a (co-operative) butter factory in Scone itself. Murrurundi is a smaller town, enjoying, at an elevation of 1548 feet, the colder climate of the foothills of the Liverpool Range. It is surrounded mainly by grazing holdings. Its chief importance as a population centre, however, is given by the presence of railway workshops.

The Muswellbrook-Aberdeen area was also settled in the thirties. Muswellbrook is a beautiful little town, the centre, like Scone, of a mixed farming district, in which horse and cattle raising play an important part. Lucerne is grown here upon the high banks of the river by the aid of pumping machinery, which, in many cases, has to lift the water 40 feet from the river. Irrigation is necessary, if advantage is to be taken of the fertile alluvial soil, in the absence of a coastal rainfall. Muswellbrook gains two further important advantages in being a growing coal mining centre, and the junction of the Merriwa branch railway, with the great northern line. The town also possesses a (co-operative) butter factory, which, during its 1924-1925 year, produced 187 tons of butter, of which 96 % was choicest quality.<sup>9</sup> Aberdeen, a smaller town, seven miles from Muswellbrook, is the centre of what is mainly a grazing and mixed farming locality—along Rouchel Brook and other tributary streams. It gains its importance in being the headquarters of the Australian Chilling and Freezing Coy.

These works chill mutton and beef for Australian markets, and freeze for the overseas trade. In Muswellbrook and Merriwa are smaller refrigerating plants, for the treatment of rabbit carcasses. Rabbit-trapping is becoming an important supplementary industry to farming in the grazing and mixed farming areas of the Hunter, proving a veritable godsend not merely to the professional trappers, but to many of the smaller farmers, whose subsistence the uncertain rainfall renders so precarious.<sup>10</sup> Aberdeen also possesses a proprietary butter factory.

9. Figures supplied by manager, Muswellbrook Dairy Co. Ltd. During the 1925-1926 year the butter production was 271 tons—a decline of 108 tons. From the farmers' standpoint, Nature's niggardliness in the 1925-1926 season was partly offset by better prices. Both the Scone and Muswellbrook factories were, like that of Denman, known as "Co-operative" until June, 1926. No alteration whatever, however, has been made in their control since the deletion of the word from the registered name.

10. The Country Freezing Co., of Muswellbrook, during 1925 sent upwards of 373,000 rabbit carcasses to Sydney, valued at £9,340. This figure represents only a part of the actual number of rabbits trapped for food and skins in the district.



Singleton is the oldest and largest town of the Upper-Hunter. Its site was discovered in 1820. Most of the grants in the area were taken up in the twenties in many big estates, with the result that small farming was prevented for nearly a century. Even to-day large holdings are characteristic of the environs of Singleton. It has always been a grazing district, though wheat was grown fairly early, and continued as a representative form of farming for nearly three-quarters of a century, the old town mill having been shut down some 20 years ago. Vine growing was for long a primary industry of the district — largely the pre-occupation of German families. In earlier days every homestead had its vineyard, and made its own wine. To-day some grapes are still sold, but there is no wine industry—other industries pay better.

Singleton has grown most within the last 20 years. The advance came with the advent of dairying, made possible by the enterprise of two butter factories—one a private company, the other co-operative—the latter alone operating to-day,<sup>11</sup> and the breaking-up of some of the bigger holdings under the pressure of land taxation. As dairying has advanced, flour-milling, wine-making, and grazing have receded in importance. Dairy farmers also raise cattle for the market. Side by side with dairying, too, has gone the advance of orcharding, both in stone and citrous fruits, mainly in the Warkworth-Bulga area to the south-west of Singleton. Here the country seems well adapted for both sorts of activity, though, generally, the country on the north-east side of the Hunter is better for most purposes than that on the south-west. It is on the north-eastern side principally that the Hunter hardwoods are got. Saw-mills are scattered throughout the Upper-Hunter, but, in contrast, say, with the Wollombi district, are comparatively few in number. The mixed agricultural crops of the Singleton district include maize, lucerne, fodders, and even a little cotton.<sup>12</sup>

The possibilities of cotton as a primary industry in the Hunter district are worthy some special consideration. It so happens that agricultural experts have declared the

<sup>11</sup> It has registered under the Co-operation, Community Settlement, and Credit Act 1923, and so retains the word "Co-operative," in its name.

<sup>12</sup> I am indebted to Rev. A. P. Elkin, M.A., a native of Singleton district, and late rector of Wollombi, and to Mr. H. Wenholtz, B.Sc.Agr., special agricultural instructor in the Department of Agriculture, for these and many other facts in this chapter.

areas around Singleton (including most of the Mid-Hunter) and along the upper reaches of the Hunter itself to be among the few areas in N.S.W. which have already proved suitable for the commercial production of cotton. Many different soils are suitable for the cotton plant; the heavier the rainfall the poorer the soil which can be used. If there is sufficient moisture in the soil, the dryness of the atmosphere is no drawback. Alluvial soils, high temperature, and light rainfall combine to make the central Hunter specially suitable. It is true that cotton-growing here is still only in the experimental stage, with a scarcity-market to offer the inducement of high prices to the experimenter, but confidence in its future has been practical enough to lead the British-Australian Cotton Association Ltd. to erect at Waratah, near Newcastle, a cotton ginnery, with a £20,000 plant-equipment. The Association has set up the ginnery as a business risk, and undertakes to market the lint for the grower in England. As a further inducement to experimenters, the N.S.W. Government has guaranteed, over three seasons from 1923 to 1925, fixed prices on a yearly diminishing scale for a yearly improved staple in the cotton. The results so far have been small, the ginnery having to work only a very few weeks in the year. The equipment could turn out 160 bales of ginned cotton a week.

The quality of the cotton produced on the small experimental areas is considered to be very satisfactory, the cotton clinging well together, and the fibre being remarkably strong. With all this to the growers' credit, however, they are likely at any season to be the sport of market conditions, over which they can exercise no control. It was the inability of American crops to meet the demands of English textile-makers, and the consequent great rise in the price of cotton (from 9 cents a pound in 1914 to 31 cents in 1919) that led the British Board of Trade to cast about for suitable future supplies within the boundaries of the Empire. Australia has come under consideration, and received some impetus towards cotton production as a result, but as the main hopes of the English textile manufacturers are centred on Nigeria, the Sudan, and Uganda, where labor is always likely to be plentiful and cheap, the Australian farmer who stakes his all on cotton would seem to be inviting inevitable disaster sooner or later. There is much sense, therefore, in the advice given to farmers by the Department of

Agriculture<sup>13</sup> that only small areas, such as can be worked in conjunction with other forms of farming without much extra labor, should be planted with cotton. If the farmer avoids "putting all his eggs in one basket" he should be able to take advantage of promising high prices without running undue risks—an advantageous arrangement more than possible with a form of crop which should, in any case, be ploughed out and resown every year.

#### THE MID-HUNTER DISTRICT.

The middle reaches of the Hunter are the oldest farming area north of the Hawkesbury. The Mid-Hunter district may roughly be defined as a fifteen-mile wide strip, extending from a few miles east of Singleton to a few miles east of East Maitland, with the Branxton Gap as a kind of bisector. This is a purely arbitrary and somewhat unsatisfactory limitation to put upon the area, particularly as it excludes the country around Broke and the South Maitland coalfield, both of which are frequently associated with the Mid-Hunter, but which we have chosen rather to describe as part of the Wollombi district, mainly because the drift of population is in the direction of, though not into, that town.

The Mid-Hunter is a district essentially of intensively cultivated farm-lands, with a wide variety of productiveness. East<sup>14</sup> and West Maitland, particularly the latter, are large towns, whose importance has been built up because they have long been marketing and distributing centres for country stretching far beyond their more immediate environs, to which they are becoming increasingly confined for supplies of market products and opportunities of business. Maitland is noticeably being eclipsed by Cessnock, both in size and importance as a business centre and market for farming products. Cessnock is the centre of a district in which mining is of first and farming of secondary importance; the reverse is true for Maitland.

The Mid-Hunter was first settled in the early twenties. For nearly half a century, wheat was the chief agricultural product of the wide area served by Maitland. In the sixties there were upwards of 15 flour-mills, scattered between Singleton, Wollombi, Morpeth, and Dungog. But the coastal moisture, always the

13. Farmers' Bulletin No. 150, Department of Agriculture, prepared by H. Wenholz, B.Sc.Agr., and E. S. Clayton.

14. East Maitland to-day is mainly a residential town.

enemy of the wheat-grower, eventually destroyed the industry, for inability to cope with the rust in 1865 led to its abandonment. The crops which have since become characteristic of the Mid-Hunter, and have made the district famous, are lucerne and similar fodders. The lucerne crops, grown on the rich river flats, which are worth from £100 to £120 per acre, are cut six or seven, or even nine, times a year. They are specially profitable whenever droughts occur in other parts of the State. Varieties of millets are cultivated, including the broom millet—at Morpeth, Largs and Louth Park. Maize is a cereal for which the warmth and moisture of the district are suited. Onions, potatoes, cabbages, pumpkins, watermelons and other vegetables find good markets locally, in the nearer coalfield towns, and in Newcastle; larger quantities especially being sold in the "Union" market—a proprietary concern—in West Maitland. Bee-keeping is no insignificant side of mixed farming in the district, one Maitland business firm ranking among the chief suppliers of bee-keepers' materials in the State. The orchardists of the Mid-Hunter, growing both stone and citrus fruits, get excellent results, and are worried, like orchardists everywhere, mostly only by uncertain market conditions.

West Maitland is one of the chief horse and cattle markets of the State. In the course of a year thousands of horses, fat cattle, store cattle, milch cows, calves, pigs, and sheep pass hands in the sale-yards.<sup>15</sup> There is a local pride in horse and cattle breeds, which dates from the days (1825) when the Australian Agricultural Coy. introduced choice breeds on to its giant free grant<sup>16</sup> of nearly half a million acres between the Hunter and the Manning. Sheep, however, are not raised in any great numbers. For all but a few varieties, such as the Romney Marsh, coastal conditions of frequent rainfall are unsuited for sheep-breeding.

Around Maitland during the last twenty years there has been a noticeable transference of activity from agricultural cultivation (except vegetable growing) and stock-raising to dairying. With the advent of the cream separator, pasteurising, and the co-operative butter and cheese factory, and more latterly with the growth of markets for fresh pasteurised milk on the coalfields and

15. A total of 76,914 beasts were sold in 1913, according to the late Mr. T. E. Petrice, late editor of the "Maitland Mercury." 16. The actual area granted to the A.A. Co. in the locality mentioned was 437,103 acres.

in Maitland, Newcastle and Sydney, the farmers have found dairying to be, on the whole, a sure form of highly profitable undertaking. In the western end of the district, they are served by their co-operative factory at Branxton, which, apart from its importance as a coal mining town, has pushed forward as a farming centre during the last sixteen years. Dairymen at the eastern end of the district send their milk either to the Raymond Terrace dairy factory or, if they are near the railway line, direct to milk distributors in Maitland, Newcastle, and Sydney.

For many years the Hunter has been known as the "wine river" of N.S.W., because of the special quality and delicacy of the products of its vineyards.<sup>17</sup> The earliest vines were grown in 1828, on the porphyry rock soil of the Williams River hills. The industry spread thence to the Paterson, the Hunter and the Goulburn. Ninety-six years ago, at Dalwood, near Branxton, was planted the first vineyard of the Mid-Hunter; some of the old vines are still flourishing. Another important group of vineyards was planted on the limestone hills of Rothbury, also near Branxton, in 1863-1864. Later, in 1886, a wine comparable with European vintages was produced from vines planted on the volcanic uplands of Pokolbin.

With the entry of Hunter River wine as a serious competitor to European products, the industry began to stride ahead. Numbers of people responded to the increased demand by taking up land for vine-planting. Carelessness and slipshod methods in the industry were a result—and a consequent inferior wine. The demand naturally fell off, and Hunter River wine became a drug on the market. Many gave up their vineyards. A revival of the industry followed the advent of Federation in 1901, with the removal of interstate tariff barriers and the imposition of a 3/- per gallon protective duty in favour of Australian brandies. This preferential treatment led to the conversion of vast amounts of surplus wine on hand into brandy in distilleries. The interest which the student of economics finds in these changes is their effect upon the size of the unit of organisation in the industry. The small enterprise making wine on a limited scale fast began to disappear. Large distilleries

17. For facts about wine industry, refer to Chapter IV., by Mr. T. H. Parssé, Maitland District Handbook, published in 1914, in connection with the meetings of the British Association for the Advancement of Science.

required large outlay. The need for a wine representative of the district, of the highest quality, and of even flavour throughout, led to the making of all wine at a very few centres. This gave the usual economy in the concentration of production. Vignerons now sell their crops as they stand to the few big firms, who cart away the grapes to their cellars.<sup>18</sup> Such wine as does not reach the required standard is distilled into brandy—an arrangement that ensures at least some return to the grower, whatever the quality of his grape.

The chief apprehension of the vine-grower to-day lies in the uncertainty of social action in regard to the liquor traffic. Evidence of the reality of this fear was provided in a recent deputation of organisations interested in the wine industry, which protested to the then Premier<sup>19</sup> against the activities of the Licenses Reduction Board. A decision of the Board had just closed forty wine bars in the electorates of Sydney and Balmain alone. A representative of the largest wine-and-brandy-making firm in the State (the owners of the Dalwood vineyards on the Hunter) stated that 70 % of the wine consumed in N.S.W. was distributed through the wine bars. But for fears arising out of the closing of wine bars, his firm would have doubled its holding capacity for the next vintage. In 1923, the firm had taken, approximately, 2500 tons of grapes from the Murrumbidgee areas; in 1924, 5000 tons could have been absorbed if the avenues of distribution had not been jeopardised. He had found great uneasiness among the vine-growers, whose product had become almost unsaleable, some having already pulled up their vines and planted citrus fruits.

The Premier's reply<sup>20</sup> was non-committal and inconclusive. After repudiating the suggestion that the Government was dallying with the prohibition question, "the Ministry," he said, "takes the view that in a great social matter of this kind, the people of a State have the right to express an opinion. The prohibition movement, however, must be recognised. A vote on the matter will have to be taken some day in this State. And until that vote is taken there will necessarily be an atmosphere of uncertainty." Nevertheless, failing always to understand that the consumption of good, wholesome

18. Some make their own wine and sell it to the big buyers, who store and mature it. 19. Sir George Fuller. 20. As reported in the "Sydney Morning Herald," 17.10.24.

wine had any deleterious effect upon people, he hoped that the Government would be able to do something that, while keeping the distributing agencies clean and wholesome, would assist in the building up of a great primary industry. This is the typical politician's attitude which leaves the vine-grower as uncertain about his prospects as it effectively postpones the solution of one of our most insistent social problems. We can appreciate the awkward problem of administering even-handed justice to growers, makers and distributors which every Government anticipates in event of the public conscience demanding prohibition. What is neither courageous statesmanship for the whole community, however, nor plain fairness to its grape-growing section, is the habitual evasiveness and very real dallying of Government after Government when challenged to show leadership in liquor reform.

A description of the primary activities of the Mid-Hunter would not be complete without brief reference to the poultry-farming industry, and to timber-getting. The breeding of poultry is carried on on a big scale on some Mid-Hunter farms. An interesting feature is the despatch from the district of thousands of day-old chicks, many of which go to Queensland. The district is not greatly noted for timber-getting—being mostly cleared country—but hardwoods are got out on the spurs towards the Paterson.

#### THE LOWER-HUNTER DISTRICT.

The Lower-Hunter District may be said to include not only the lower reaches of the river extending from just east of the Maitlands and Morpeth to the sea, but also the area of the Upper coal measures to the south and south-west of Newcastle. The district embraces, therefore, some of the richest as well as some of the poorest land of the Hunter River Valley. The flats stretching along the river banks between Morpeth and Raymond Terrace are the richest holdings, as measured in the price per acre, on the Hunter. On the other hand, much of the country round about the coal mines is of little use for agriculture, for it is almost axiomatic for the Hunter generally that "wherever you get coal measures you get poor soils."<sup>21</sup>

The district takes in a small portion of the Williams River Valley. Raymond Terrace, on the junction of

<sup>21</sup> Mr. C. A. Susamlich, F.G.S.

the Williams and the Hunter, is the centre of much dairying activity and mixed farming. The soils are heavy, and suited specially for the fodder crops. The Raymond Terrace Dairy and Produce Coy. is one of the largest in the Valley of the Hunter.<sup>22</sup> During the 12 months up to the end of April, 1926, this farmers' company took from its supplier-members (300) no less than two and a-quarter million gallons of milk, more than half of which was pasteurised and sold to distributors in Newcastle and Sydney, the remainder being transformed into 288 tons of cheese and 442 tons of butter. The collecting, pasteurising and marketing of fresh milk is the distinguishing activity of this society. Before 1916 it confined itself to butter and cheese making, upwards of 1000 tons of butter being manufactured in some years. The variations in winter and summer conditions, which are a permanent feature of dairying, and the relative lightness of the rains in the last few "drought" years, excepting the summer of 1924-25, are well illustrated in the following figures, supplied by the Company<sup>23</sup> :—

Half-Year.	Butter		Milk	Sales.
	Rainfall.	Made.	Received.	
	Inches.	Tons.	Gallons	\$
May, 1919-Oct., 1919	.. 17	100	852,870	68,421
Nov., 1919-Apr., 1920	.. 22	108	1,229,013	98,298
May, 1920-Oct., 1920	.. 13	38	685,629	54,707
Nov., 1920-Apr., 1921	.. 28	115	1,065,823	96,725
May, 1921-Oct., 1921	.. 23	41	805,000	58,821
Nov., 1921-Apr., 1922	.. 21	238	1,019,157	75,541
May, 1922-Oct., 1922	.. 24	94	727,311	73,079
Nov., 1922-Apr., 1923	.. 14	175	705,761	76,306
May, 1923-Oct., 1923	.. 13	63	876,673	68,682
Nov., 1923-Apr., 1924	.. 21	113	1,138,086	85,068
May, 1924-Oct., 1924	.. 13	127	1,137,993	73,815
Nov., 1924-Apr., 1925	.. 23	373	1,186,247	103,565
May, 1925-Oct., 1925	.. 20	182	1,091,415	107,290
Nov., 1925-Apr., 1926	.. 22	260	1,175,944	114,245

The factory does not undertake bacon-curing, despite pig-raising in the district.

#### THE PATERSON-WILLIAMS DISTRICT.

The twin valleys of the Paterson and the Williams have been regarded as choice areas ever since they were first settled in the thirties. Vineyards, as we have already stated, were planted on the Williams as early even as 1828. Dr. John Dunmore Lang, when writing

<sup>22</sup>. The company is now occupying extensive new premises at Hexham. During 1925 it ceased to be known as a "Co-operative."

<sup>23</sup>. From information supplied by the manager.



of the Hunter district as he knew it in 1875, could state that the "Paterson's River is not only a superior grain-growing country; it is equally famous for its vines and tobaccos"; and that "the agricultural capabilities of this country are great beyond all calculation, and squatting is evidently destined, at no distant period, to be fairly eclipsed by agriculture. At all events, the idea that an acre of vines may yet be found as profitable as a thousand sheep is no absurdity."<sup>24</sup> It is useful to quote Dr. Lang's observations if for no other reason than to indicate the changes which can take place in a rural district. Half a century ago sheep, wheat, wine and tobacco were the representative products of the two valleys. To-day Dr. Lang would find instead extensive dairying, pig-raising and maize-growing on the Williams, and the Paterson famous for its wonderful oranges.

The Paterson has an important tributary in the Allyn and the Williams in the Chichester. They together drain the wettest portion of the Hunter watershed. Being short and swift-flowing, the soils which they deposit on the flood-plains along their banks are, as with all coastal rivers in their faster-flowing upper reaches, of a loose, sandy nature, suitable for orcharding. The sediments deposited, on the other hand, along the Hunter itself at Maitland contain heavier materials, which are suited excellently for lucerne-growing. When the more enterprising farmers of the Paterson and Williams set out to plant fodders, they first fertilise the ground.

The orange-growing which makes the Paterson famous to-day had a more or less fortuitous beginning. Up till a few years ago Paterson oranges came from seedlings, which had sprung up without any effort at selection.<sup>25</sup> Soil, climate, and proximity to the market combine to make orange-growing pay much better than the cultivation of lucerne on the small river flats, which, when planted with oranges ready to bear, will bring £100 per acre.

Paterson and Gresford are the chief centres for the Paterson valley, being surrounded by orchards and mixed farms. Dungog and Clarence Town are the two

<sup>24</sup>. "Historical and Statistical Account of N.S.W., 1875." Dr. Lang mentions Messrs. Baxters' farm, four miles below Dungog, on the road to Clarence Town, where maize up to 80 bushels to the acre was yielded, and where also was grown a small area of cotton. <sup>25</sup>. Interview with Mr. H. Wenholtz, B.Sc.Agr., of the Department of Agriculture.

centres for the Williams. These towns serve a cattle-grazing, mixed farming and dairying population. Dungog can boast a co-operative butter factory, with 260 shareholders, of whom 240 are suppliers, which during summer months sends to the market 14 tons of butter and 18,000 gallons of milk a week. During the year ended 30th June, 1926, the factory produced 343 tons of butter, and sold in Sydney 769,678 gallons of fresh milk.<sup>26</sup>

It is interesting to recall that the Williams, like other rivers on the N.S.W. coast, had a flourishing cedar-getting industry, which disappeared before the introduction of an effective system of timber conservation. Lang was credibly informed in the early seventies that the cedar trade "till recently . . . used to bring into Dungog district not less than £2,000, or £3,000, a week."<sup>27</sup> He mentions one tree 9 feet in diameter, with a girth of 29 feet, perfectly sound throughout, and estimated to yield 30,000 feet of timber, worth, at the then prevailing price of £1 per 1000 feet, not less than £30.

#### THE WOLLOMBI DISTRICT.

As a field of study of the changes to which communities may be subjected, the area south-westward of the Mid-Hunter offers a most interesting example. This is the district around Wollombi, with which it is appropriate to-day to bracket at least the half of the South Maitland coalfield about Cessnock. For three-quarters of a century Wollombi, at the junction of roads linking the metropolis with Newcastle, Maitland, Singleton, and the north, was a town of commanding importance. Since about 1900, through various interesting economic causes, its old-time glory has gradually faded with the swift rise of its upstart rival, Cessnock.

On March 5th, 1829, Surveyor-General Mitchell's convicts completed the road from Wiseman's Ferry to Maitland. By that year people were already living at Aellalong—a small hamlet even to-day, but destined in a few years to be a large mining town—for population had gradually been spreading northward, from the Hawkesbury. The site of the village of Wollombi, destined to become a bustling centre of life for at least seven decades, was reserved by 1833. With the starting of the road through from Singleton to Brisbane in 1836, Wollombi's importance began to grow. Besides being at the

26. Figures supplied by the manager. 27. Lang, *Ibid.*, pp. 246-248.

intersection of the chief mail routes, it was the centre of a flourishing mixed farming, grazing and wheat-growing area. Grazing was carried on on the hills, and the cattle were sold in Singleton and Maitland. Much of the wheat was ground in mills at Wollombi, Aellalong and Millfield.<sup>28</sup> There was also a small but active wattle-bark industry, supplying raw material for tanneries in Maitland and Newcastle. In the coaching days, before the coming of trains, the travelling public, and the stockmen with their moving herds, contributed to the bustle of Wollombi itself, which, in the forties, had become the centre of police and judicial districts, extending from Wiseman's Ferry to Aellalong. Cessnock was but a tiny village on the road to Maitland.

To-day the picture is one of severe contrast. From a lively township, requiring the monitory services of a P.M., a C.P.S., and seven policemen, Wollombi has subsided into a "sleepy hollow" of a hundred souls—left to the care of one under-worked constable!<sup>29</sup>

Why this declension?

The causes are several. Wheat-growing disappeared from the district at the time of its general abandonment on the Hunter, and for the same climatic reasons. The farmers then turned to other crops, such as maize, hay and fruit. Towards the end of the century, dairying began to be more profitable, and, as at Singleton, Maitland, and other centres, was introduced on to the same holdings. This caused the decline in general farming.

Cultivation in the district has become decreasingly profitable for reasons arising out of the qualities of the land itself. The country around Wollombi, it will be remembered, is purely Hawkesbury sandstone, and that around Aellalong and the South Maitland coalfield towns a mixture of conglomerates, sandstones and shales, traversed by a narrow outcrop of the Greta coal measures.<sup>30</sup> None of these substances makes really good soil. Here and there at a few isolated spots on high ridges—as at Mt. View and Warrawalong — there are outcroppings of rich red basalt, which have been appropriated for vineyards. The mixed farms of the district are mostly along the narrow valleys of the Wollombi Brook (known also in parts as the Cockfighter) and its tributary creeks, the Wattagan, Congewai, Dairy Arm and Yango. Down these valleys are washed a light

<sup>28</sup>. Hence the name Millfield. <sup>29</sup>. He is under-worked, even with the surrounding district thrown in. <sup>30</sup>. See Map No. 2.

sandy loam from the gravelly ridges. Unless fertilised, its nutriment is easily exhausted. The soil on the old farms has become poor, precisely because of the farmers' neglect to fertilise. Added to this are the usual difficulties of pests. One ploughing is necessary in June and July (allowing the frost to sweeten the land), and another in September and October, in order to combat cut-worms and other predatory insects. The cut-worms attack such crops as maize, tomatoes, potatoes, squashes, etc., and can best be fought by the plough, which removes the residue vegetable matter on which they live. A further reason for the present infertility along the banks of the various streams is that the ploughing of the land loosens the soil, which has been carried away at times of strong floods (coming infrequently, it is true), which sweep fiercely down the narrow valleys. If there happened to be a good crop in at the time the soil might be saved. When the washing away occurs, it is generally because the farmer has shown bad judgment by ploughing at a time too near the winter months; floods seldom come after July and August. Floods do not come regularly, and they do not leave a good sediment.

There is a general opinion that the Wollombi district is "worked out." Of recent years many farms have been entirely abandoned, and others merged into one another to form larger holdings. Orcharding and market gardening give most of the farmers just about a living. Cessnock is a very good and certain market for all kinds of vegetables, and for the peaches, plums, apricots, oranges, and lemons, as well as the maize and hay, grown in the district. Some of the farmers make a fair success of dairying, and send their cream to the factories either at Singleton, Cessnock or Wyong. Yet the fact remains, that the trend is to further decline. At Murray's Run (at the head of Wollombi Brook), and on the Dairy Arm, the Wattagan, and, to some extent, on the Yango and Cockfighter (i.e., the Wollombi Brook below Wollombi), where so many small cultivation holdings have been deserted or merged into bigger cultivation or cattle runs, the population has decreased from 50 % to 75 %.

The building of the railway line nearer the coast took a valuable strategic advantage away from the district, whose fortunes have been further lowered by unscientific use of its primary resources. To these causes

of its decline as a rural area have been added the effects of the invading mining industry. After all, the farmer cannot help contrasting his lot — with all its uncertainty, its long hours, monotony and poor returns — with that of the miner, the most irresponsible of men, whose work (on the Maitland field, at any rate) is as constant as he likes to make it, whose pay is handsome, and who, outside a stretch of working hours from 7 a.m. to 3 p.m., may enjoy the social amenities of a town life. Small wonder, then, that coal mining is drawing men, particularly the younger ones, away from the farms. The abandonment of holdings is thus partly to be accounted for. A growing number of farmers whose land happens to be near collieries follow the double occupation of mining and farming—an interesting revival of medieval practice.

There are good prospects for the local timber industry for some years to come. The hills produce hardwoods which are used extensively for building and mining needs. Much local timber has gone to the making of Cessnock. In the collieries, the younger timbers are used for pit-props, slabs and sleepers, the sleepers being of a light type, made by splitting in halves the trunks of the young trees. Over a sector of eight miles from Wollombi, between the Sydney and Singleton roads, there are eleven teams (most of them bullocks) getting timber, each drawing on the average 2,000 feet in the round, and from 1,300 to 1,400 feet sawn. In the opposite direction, between Wollombi and Cessnock, there are some ten teams. Some nine saw-mills, spread between the head-waters of the Wollombi and Cessnock, apart from the mills attached to the pits, shape the timber for its various uses. Less than forty years ago, many families added to their resources by gathering the wattle-bark, but the industry killed itself by eliminating the wattle trees.

The growth of Cessnock and the towns of the coal-field within this district we shall leave to later chapters for discussion.

#### THE PORT STEPHENS DISTRICT.

Very little is to be said of the country lying between the port of Newcastle and its rival in everything except economic importance—Port Stephens. Unlike the more happily endowed districts which lie to the west, the area has been poorly served in its physiography. It is a country of low hills, flats and swamps, with the poverty

of soils (except for a streaking of basalt) usual where the surface is composed of wind-blown sand and outcroppings of sandstones, shales and conglomerates. A good third of the area is Newcastle coal measure country, but only at the extreme southern point—Stockton—has any coal been won. The obtrusion of permo-carboniferous features, including the coal measures, alone results in poor soils, but this poverty might be offset were the district traversed by streams distributing the alluvium of richer parts. The country around the Paterson and the Williams is of very similar composition, but has become one of the choicest farming areas by reason of its patches of fertile cultivation lands, formed by the creek washings from the basalt hill and mountain tops. The Port Stephens district has neither fast streams nor basalt outcroppings on its hills for the making of alluvial floodplains; hence its entire unsuitability for agriculture, except, perhaps, for vegetables. Some dairying and a little vegetable-growing for the Newcastle market are the main pursuits of the thinly scattered population of the area.

#### SUMMARY.

The chapter opened by re-stating the correspondence between the three aspects of the Hunter's physiography (elaborated in the first three chapters) and the three types of industry based thereon—primary industry upon topography, extractive upon geology, and manufactural upon geography—but suggested that a too rigid use of this classification might neglect the equally real organic unity of all industries together. The chapter then proceeded to describe and discuss the primary industries, and should, therefore, be regarded as sequent to Chapter I. Each of the seven rural districts comprising the Valley was treated in some detail, discussion of particular phases being elaborated when warranted.

It was seen that the largest of the rural districts, the Goulburn Valley, is a country primarily of sheep and cattle grazing, with some mixed farming and dairying, an area of big estates, denied the maximum use of the rich soils of its northern half by insufficient rains and absence of irrigation. The Upper-Hunter, next in size, combines in about equal degrees in its four constituent districts the activities of pastoralist, agriculturist, and dairyman, and around Singleton has witnessed interesting changes in the forms of rural enterprise. Discussing at some length the problems of the nascent cotton industry, it was sug-

gested that cotton production will be an economic undertaking for the grower only if made subsidiary to other forms of farming.

The Mid-Hunter was shown to be a district essentially of intensively cultivated farm-lands, producing a wide variety of crops. Here, again, important changes have taken place in economic activity, notably in the organisation of the wine industry, and in the movement from agriculture and stock-raising to dairying—changes in which external market conditions have exercised a governing influence. The problem of the vineyard is discussed in some detail, and the absence of a decided policy of liquor reform in successive Governments condemned.

The Lower-Hunter was described as a district embracing some of the richest as well as some of the poorest lands of the Hunter River Valley. Its primary industry includes mixed farming, fodder-crop cultivation, and dairying, with the collecting, pasteurising and marketing of fresh milk as the distinguishing activity.

Recalling from our first and third chapters that the Paterson and Williams Rivers together drain the wettest portion of the Hunter watershed, these rivers, short and swift-flowing, depositing a loose sandy mixture of basalt silt, it was shown how the surrounding district lends itself specially to orcharding, mainly for orange-growing, though mixed farming, cattle-grazing and dairying are equally characteristic of the area, all four forms of primary activity having replaced sheep-raising, and the growing of wheat, vines and tobacco, which characterised the two valleys half a century ago.

From the standpoint of the student of economic change, probably the section of the chapter dealing with the fortunes of the Wollombi District has been the most interesting. Here has been shown the picture of a rural area in decline—a condition induced by loss of geographical advantage, ill-judged use of limited natural resources, and the competition of the invading mining industry. Not the least interesting accompaniment of the decline is the changing distribution of the farming population, and its gradual absorption into the pursuit of mining.

Lastly, the chapter dealt briefly with the district south of Port Stephens, showing it to be of little economic importance for primary industry, mainly because it fails to share with more richly endowed areas the advantages of physiography.

CHAPTER V.  
LIVELIHOOD FROM COAL-MINING  
EXTRACTIVE INDUSTRY IN THE VALLEY.

The history of the coal-mining industry of the Valley begins with the discovery of the "Hunter's River," or "Coal River," by Lieutenant John Shortland, on September 9th, 1797. Shortland took back to Sydney specimens of the coal he had observed on the cliff of Nobby's ("Coal Island"). The specimens were pronounced to be proof of the existence of coal measures. Further investigations followed, and almost immediately a small trade in the coal was begun by a few of the more enterprising of the settlers. Thus, in the closing years of the 18th century the little trading "twenty-tonners" of Messrs. Simeon, Lord, Underwood and Meehan initiated the seaborne traffic in coal from Newcastle which, a century and a quarter later, was destined to reach a yearly shipment of five and a half million tons.

The first consignment of Newcastle coal for Government purposes was loaded on to the schooner "Francis," one of the two ships in which Lieutenant-Governor Hunter and the survey party under Ensign Barrallier (a Frenchman) visited the port in June, 1801. Convicts were employed to carry the coal in creels and bags from the small tunnels cut in the steep slope which to-day rises abruptly on the southern side of the main street of the city.

For upwards of a quarter of a century the output of coal won by the little companies or partnerships exploiting it was very inconsiderable. In 1824 the Australian Agricultural Company received its charter in England, and its large grant of land in N.S.W., *together with the monopoly for forty years of coal mining in the Colony.* This meant that no one else in all Eastern Australia had any legal right to win coal. The superintendents of the company, however, were wise enough not to interfere with the existing "pot-hole" pits. The first important assertion of the company's rights was made when the brothers John and Alexander Brown, two Scottish miners, a few years later began to sink a colliery



at Four-Mile Creek, on the Tomago measures, between Thornton and East Maitland. The A.A. Company proceeded against the Browns in the Supreme Court and won the action. This was one of the great lawsuits of the early days of the Colony. But it was a pyrrhic victory for the company. So strong was the public outcry against the monopoly that the company wisely took the hint of the Government, and ceased henceforth to interfere with other enterprisers in coal.

The firm of J. and A. Brown has since grown to be the largest family proprietary enterprise in the coal industry, owning to-day four big groups of collieries—Pelaw Main, Richmond Main, Stockrington, and Duckenfield Back Creek (two of which—Richmond Main and Pelaw Main—are the second and third largest in the district)—as well as an engineering works at Hexham, colliers and tugs, and about 23 miles of railway, with some 2000 men engaged about the collieries alone. The old Duckenfield colliery at Minmi was opened by another early pioneer of the industry, John Eales,<sup>1</sup> and only later became absorbed by the Browns. Meanwhile, the A.A. Company had started on a large scale with a number of pits about Newcastle. At a later stage a number of its own officers began to open independent collieries of their own.<sup>2</sup> By 1875 there were at least sixteen important mines operating in the north, the property either of individuals or companies.<sup>3</sup>

The most important years in the history of the industry were 1886-1887, when Prof. (Sir) T. W. E. David, by his geological survey labors, proved the existence of the Greta seams under what is now the South Maitland coal-field. Coal from these seams was being carted to West Maitland by 1889. The first large colliery was opened at East Greta in 1891 by the East Greta Coal Mining Co., the real pioneers of the South Maitland field. The company had to build three miles of railway to link up with the main Government line. Straightway there developed a great demand for the new coal. The company soon opened a second colliery, and by 1901 had established another (Stanford Merthyr) at Kurri Kurri,

1. Known as the "one-man settler," because of his numerous pioneering enterprises.

2. E.g. the Wallsend Colliery in 1859. 3. Borehole, Burwood, Minmi, New Lambton, Wallsend, Lambton, Waratah, Dark Creek, Co-operative, Sunderland, Nott's Tunnel, Mitchell's Tunnel, Rathluba, Stony Creek, Anvil Creek, Rix's Creek. (Lang, *ibid.*, pp. 74 and 78.)

six miles from East Greta, a step necessitating the extension of its private line. Messrs. J. and A. Brown about the same time established the neighbouring mine of Pelaw Main.

Other large collieries on the field followed one another in quick succession, each becoming the vital organ to the life of a quickly growing mining township. Thus in 1902 the A.A. Coy. opened the first of its Hebburn collieries, establishing the town of Weston; in 1904 the Caledonian Collieries opened at Aberdare, the Abermain Seaham Collieries Ltd. at Abermain, and the Wickham and Bullock Island Coal Coy. Ltd. at Neath. A very large mine (Aberdare Extended) was opened up by Caledonian Collieries Ltd. in the heart of Cessnock in 1906, to be followed by another at Bellbird in 1907 by the Hetton Bellbird Coy. Others established during these years were the Whitburn at Greta (Newcastle Coal Mining Coy.), South Greta, Ayrfield (Ayrfield Coal Coy.), Abermain No. 2 (Abermain Seaham Collieries Ltd.), and since 1912, Aberdare South and Aberdare Central (Caledonian Collieries Ltd.), Richmond Main and Stockrington (J. and A. Brown), Hebburn No. 2 (Hebburn Ltd.), Cessnock and Kalingo (Wickham and Bullock Island Coal Coy. Ltd.), Pelton and Stanford Merthyr No. 2 (East Greta Coal Mining Coy. Ltd.), Greta Main (Greta Main Coal Coy.), West Greta (West Greta Coal Coy.), Central Greta (Central Greta Coal Coy.), New Greta (Kirton and Earnshaw Ltd.), and Rothbury, near Branzton (Rothbury Estate). New mines are at present in development at Millfield and Aellalong.

#### ASCENDANCY OF SOUTH MAITLAND FIELD.

The growth of the towns of the South Maitland mining areas has been amazing. Between West Maitland and Bellbird there stretches a belt of fast-spreading communities gradually reproducing the conditions of an English industrial region. Along the railway line Kurri Kurri, Weston, Abermain, Neath, Caledonia, Aberdare, Cessnock and Bellbird are jostling neighbors. In 1886 the population between East Greta and Bellbird did not reach 500; to-day, within the Shire of Cessnock (which embraces most of this stretch and all Wollombi), at least 40,000 people find their livelihood. Cessnock itself, as late as 1904, was the merest village of less than 150 souls; at the end of 1925, with its suburbs and nearby

dependent centres, it had achieved a population of nearly 21,000.<sup>4</sup> Credit for such speedy growth is to be attributed mainly to the enterprise of the Caledonian Collieries Ltd.

Our brief review of the history of the industry has led us to describe the location of the existing mines on the South Maitland field. Despite their historically recent development, the mines on the Greta seams<sup>5</sup> in 1925 produced 68.97 per cent. of the total output of the northern coalfields.<sup>6</sup> They have thus gained an ascendancy on the market over the mines on the older Newcastle field. Their output in 1924 reached a record, being 1,500,000 tons greater than that of any earlier year, and (on account of the four months' strike) 2,500,000 tons greater than that of 1923.<sup>7</sup>

Of the seams of the Newcastle measures, the Borehole is still by far the most important, its sixteen collieries<sup>8</sup> having during 1925 been responsible for 16.86 per cent. of the total northern output. Some seven large and small collieries<sup>9</sup> work the Burwood or Victoria Tunnel seam, and in the same period produced 6.58 per cent. of the total; some six<sup>10</sup> are on the Great Northern, and produced 3.33 per cent.; while one colliery<sup>11</sup> alone on the Wallarah seam won 2.67 per cent. The relative unimportance of the Tomago measures is measured in the fact that only one colliery<sup>12</sup> of any account, situated at Ashtonfields, on Four-Mile Creek, is at work upon them, producing only .33 per cent. of the 1924 total. This total for the northern district, which reached the record figure of 8,077,689 tons, diminished in 1925, however, to 7,637,953 tons.

Statistical figures are a weariness to the spirit, but an essential instrument to understanding. In our second chapter we discussed the figures of coal resources. Figures in this chapter are used to show the extent of actual

<sup>4</sup> 4. Cessnock, 12,514; Aberdare, 2,909; Kitchener, 432; Abernethy, 559; Kearsley, 976; Quarrybylong, 154; Bellbird, 2,200; Pokoibin, Rothbury and South Allandale, 1,184. (Figures supplied by Shire Clerk, Cessnock.)

<sup>5</sup> Which includes collieries at Muswellbrook—a large one, owned by the Muswellbrook Coal Co. Ltd., and two smaller ones owned by the St Heliers Coal Co. Ltd., and Lupton Park Colliery Syndicate, respectively. <sup>6</sup> For list of collieries in Hunter Valley, see Appendix No. III. at end of chapter. <sup>7</sup> From statement supplied by U.S. Mines to Minister, 29.12.24. <sup>8</sup> Wallsend, Wallsend "C," Lambton, Lambton "B," Brown's No. 4 Tunnel, Marylands, Burwood, Burwood Extended (Redhead), Dudley, Duckenfield, Stockton, Borehole, Seaham, South Waratah, Rhondda, North Lambton, and Killingworth. <sup>9</sup> New Lambton, Victoria Tunnel, Glebe Hill, Shortland, Hillside, Happy Valley, Glenrock. <sup>10</sup> Great Northern, Northern Extended, Pacific, Northumberland, Oistana, South Teraba. <sup>11</sup> Catherine Hill Bay. <sup>12</sup> Longworth's.

business done in coal, and, as isolated facts are of no significance, are selected for comparative purposes.

We may usefully estimate the productiveness of the mining industry of the northern district by comparing its output with those of other districts and the whole State. The coal mines of N.S.W. in 1924 produced 11,618,216 tons (worth £9,589,547), an amount exceeding not only what was produced in 1923 (10,478,513 tons), but the output of the highest previous year—1921—with 10,793,387 tons. The northern district and the South Maitland field in particular contributed not only the whole of that year's increase for the State, but made good the slight deficiencies of the western and southern fields. The State's output in 1925 was somewhat less—11,396,199 tons. The 1924 record would have been exceeded but for the shipping hold-up during the latter part of the year. The 1925 production for the three fields was as follows:—

Northern .. . . .	7,637,953 tons	worth	£6,723,900
Southern .. . . .	2,052,963	" "	\$1,633,997
Western .. . . .	1,705,283	" "	\$944,618
	<hr/>		
Whole State .. . . .	11,396,199	" "	\$9,302,515

**PROBLEMS IN THE COAL-MINING INDUSTRY.**

At least four important types of problem with varying insistence demand solution in the mining industry of the Hunter Valley. First, there is the engineering problem of the prevention of unnecessary waste in the winning and use of coal; secondly, the problem of adequate facilities for the movement of the coal to its markets; thirdly, the business problem of the markets themselves—local, Australasian, and overseas; and, fourthly, the socio-economic problem of mal-adjustment in the relations between coal-owners, coal-miners, and the consuming public. The four functional factors of production are not wanting in quantity or quality. Enterprise in the opening of new mines and extending the old is vigorous and resourceful; capital flows readily to the industry, for, in general, the investors' rewards, despite irregularity, are eventually sure and handsome; labor is plentiful and skilful, if capricious and combative; and the abundance, quality and accessibility of natural resources satisfactory beyond all question. It is in the evoking of a happy correlation of these factors that the technical and social problems arise.

The remainder of this chapter will be devoted to a discussion of the first, third and fourth of the problems mentioned; that concerned with the facilities for the movement of coal we shall defer to our chapter on Transport.<sup>13</sup>

#### A.—THE ENGINEERING PROBLEM OF WASTE.

The United States Geological Survey has impressively shown that of every 2000 lb. of coal available in American collieries, 600 lb. are lost in mining, 126 lb. are consumed at the mine and en route to the boiler room, 446 lb. are lost by radiation, and 51 lb. in the ash pit; 650 lb. are lost in converting heat energy into mechanical energy, and *only 76 lb. out of the 2000 lb. are actually converted into productive mechanical power.*<sup>14</sup> This of a country whose methods of mining, transport and consumption of productive fuel are nowhere to be excelled in point of economy! What shall we say of Australian industry? Our wastes might call for even more graphic comment.

If it is fortunately true, as recently pointed out by one of our mining engineers,<sup>15</sup> that the coal mines of the Illawarra district of N.S.W. have been laid out and worked so as to permit of a high percentage of extraction, it is no less lamentably certain that coal mining in the Hunter Valley has been and still is carried on by unnecessarily wasteful methods. It is a case of the consciousness of abundant possession producing prodigality. Up to the present the people as a whole have been living under the dispensation of the law of increasing return, unconscious that the day of diminished return is surely approaching. Probably another century will have to elapse, and the easily accessible first grade coals disappear before the district will realise this phase of economic law.

Mr. J. T. Watson has pointed out that the wastes are of two kinds—(1) in the actual winning of the coal, and (2) in its use as a fuel in the colliery plants. It is obvious that the second kind is by no means peculiar to the colliery, but probably is more or less present wherever coal is burnt directly as a fuel.

<sup>13</sup>. Chapter VII. <sup>14</sup>. Quoted in R. W. Bruere, "The Coming of Coal," pp. 80-81. <sup>15</sup>. Mr. J. T. Watson, in his paper before the Newcastle Division of the Institution of Engineers, on "Waste of Coal," 1924.

A loss of up to 25 per cent., due to faults, etc., might be regarded as unavoidable on some seams, though under exceptionally favourable conditions it need not exceed 10 per cent. The working of the Borehole seam within the small area of 25 square miles around Newcastle has been exceptionally easy. Up to the end of 1922, however, some 57,500,000 tons only have been taken from this area, although, assuming the seam to be 7 feet thick, and working on a basis of 100 tons per acre-inch, the quantity which might have been taken was about 134,400,000 tons; that is, the actual loss in extraction was 76,900,000 tons, or about 57 per cent. of what was available!<sup>16</sup> It is not likely now that much of this coal can be recovered, as the older method of leaving very small pillars has led to the occurrence of "creeps," which have made the coal entirely inaccessible. More recent methods of working are avoiding this danger for the future, even if they are not quite satisfactory in economical extraction of the coal. Little has been done, or is being done, to conserve the good coal in the Yard and Burwood seams. The law of diminishing return is sure to operate as the mines push farther south to the area where the Borehole seam diminishes in thickness and quality, and the large coal will require cleaning, and the small washing, if it is to retain its place on the market.

On the South Maitland field the waste is no less evident. As the mines are being worked at present, it is questionable if 50 per cent. of the available coal will be brought to the surface. If a conservative assumption of 18 feet be taken as the average thickness of the Greta main seam, each coal acre should, on the usual basis of 100 tons per acre-inch, render 21,600 tons. Mr. Watson, employing this unit, assesses the probable loss on the field, if present methods are continued, at about 700,000,000 tons!

The inadequacy of present methods to prevent such loss lies in the wasteful system of dealing with outbreaks of fire. Most of the collieries of the Greta seam are situated near the outcrop, and follow the dip of the seam

16. "Witness the Newcastle field: mines which have ceased work during the last handful of years—Newcastle Coal Co.'s "A" and "B" pits, A.A. Co.'s Borehole, Hamilton and Sea pits, Wickham and Bullock Island, Hetton, Stockton, New Lambton, Old Lambton, and Old Walls-end—all large concerns, but now matters of the past. Millions of tons have been left in these places, never to be worked."—Mr. J. Dixon, manager, Glebe Hill Colliery.

(varying from  $45\frac{1}{2}$  deg. in the old East Greta colliery to 1 in 30 about Cessnock)<sup>17</sup> by means of tunnels, although some, on account of their position, use shafts. The method of working is known as "bord and pillar." For convenience's sake only from 8 to 10 or 12 feet of the 32 feet seam are hewn in a number of mines. When a mine is thus worked to its boundaries, the coal tops, together with the pillars, are recovered in retreating. Most of the pillars can be withdrawn because of the strong overlying conglomerate roof, and, in addition, pit props from local timber areas are abundant and cheap.<sup>18</sup> As Greta coal is liable to become heated, it is frequently necessary to seal off danger areas, a step which may or may not mean the loss of large quantities of coal.

Under the pressure of necessity, mining engineers in other countries have devised means of getting at once a high percentage of coal extraction and elimination of the dangers and losses from fires by space-packing in the mines. "In Great Britain, France, Belgium, Germany, United States of America, India, Straits Settlements, and other countries," to quote Mr. Watson, "systems of mining have been evolved and successfully applied to the working of thick seams, which could be modified to suit existing conditions in the mines of the Maitland coal-field. . . . Over by far the greater part of the South Maitland coal-field the seams are found under conditions which are very suitable for hydraulic packing of the gobs; and if the mines are properly laid out and arrangements made at the outset for that system of working, there is no reason why the maximum cost of packing should, after making due allowance for crushing the material, greatly exceed the cost of other countries, and the direct and indirect saving in other directions will very nearly offset the additional cost. Even if the cost of production should be somewhat increased, it is not a good and sufficient reason why a national asset which cannot be replaced should be wasted in an extravagant manner. In cases where the cost under existing conditions would be prohibitive, the coal should be left until improvements in methods, or increase in

17. Messrs. D. J. Ryan and A. Thomas, in *Maitland Handbook for British Association for Advancement of Science, 1914*. Aberdare Extended is worked by tunnel, with a daily output of 2,200 tons, Aberdare with 2,000 tons per day by shaft. 18. See Chapter IV., p. 54.

value, make it possible to work it as a commercial proposition."<sup>19</sup>

Mr. Watson, therefore, urges, as some guarantee against loss of coal due to fires, and to reduce danger of work on seams liable to spontaneous combustion, that there should be inserted in all mining leases, whether granted by Government or individuals, clauses to the following effect:—

"(1) Not more than 10,000,000 tons of coal to be worked from any one pair of shafts or tunnels, with hydraulic or equivalent packing of goaf.

(2) Any seam over 10 feet thick to be worked in two or more lifts, with hydraulic or equivalent packing of goaf. No lift to exceed 8 feet in height.

(3) Royalty to be paid at the rate agreed upon on all coal in the area, not merely on the coal mined, as at present. Quantity to be based on rule—100 tons per acre-inch. This arrangement intended to compel the adoption of more modern methods."<sup>20</sup>

Apart from wastes in the actual winning of the coal, there are wastes in its use. The direct *burning* of coal, as we have already urged,<sup>21</sup> is itself a most patent form of waste, in view of the many substances which gain release when it is destructively distilled. But even granting that much direct consumption of coal as a fuel must continue, there are still avoidable wastes. The engineer, for whom it is a matter of professional honour to be progressively raising the point of maximum return, will deplore the prevailing waste in boiler plants, because of soot and dust deposit on tubes, when to prevent this soot-blowers might be installed; as he will the greater loss of fuel in permitting a careless composition in the gases escaping in flues. Apart from unavoidable loss, most boiler plants allow the escape through their flues of too little carbon dioxide (CO<sub>2</sub>) and too much air. If, for instance, the CO<sub>2</sub> percentage is only 4 the wastage of coal is 40.5; with 15 per cent of CO<sub>2</sub> the coal wastage is only 11.6 per cent. A low percentage of CO<sub>2</sub> generally means that excess of air has been admitted in the burning of the coal. With 4 per cent. of CO<sub>2</sub> the excess air may reach 360 per cent. A good combination is an air excess of about 40 per cent., and the presence

19. "Waste in Coal," p. 201. 20. *Ibid.*, p. 207. 21. Chapter II., p. 15.



among the gases of 13 per cent. of  $\text{CO}_2$ .<sup>22</sup> The losses arising from badly proportioned combination could be avoided were plants equipped with a good form of  $\text{CO}_2$  indicator, and each furnace fitted with a draught gauge—thus enabling the fireman more intelligently to regulate his fires.

Waste of retrievable coal is further caused by two other practices—(1) the surveying of railway and township site without reference to the coal deposits below, and (2) the leaving of barriers of coal on the boundaries between mines. Such towns and villages as Cessnock (part), South Cessnock, Aberdare, Kearsley, Abermain, Hebburn, etc., are so situated as to imprison many hundreds of thousands of tons of valuable coal. And as in many instances barriers 132 feet wide are left on each side of boundary lines, i.e., 32 acres per mile, between 600,000 and 700,000 tons from a seam 12 feet thick are untouched in every mile of boundary.<sup>23</sup>

#### WASTE IN COKE MANUFACTURE.

A still more striking example of waste is seen in coke manufacture. As already pointed out, the best coke in the Valley is produced by the Purified Coal and Coke Coy., at Wallsend, from Borehole coal in the "bee-hive" type of oven. This oven permits the escape of all the volatile substances in the coal—a by no means inconsiderable waste of wealth during the company's 51 years of existence, and with its present yearly output of 18,000 tons of coke. There is, however, the justification that no other type of oven can transform Newcastle coal into the superior coke at present being produced—and demanded. The company's objection<sup>24</sup> to the "recovery" type of oven is that the coke it produces, except in the isolated case of the B.H.P. Steel Works at Newcastle, is unsuited to the demands of Australian industry. The friability and slightly inferior crushing strength of B.H.P. coke is no drawback, as it is absorbed by furnaces on the spot. But for the smelting industry generally the coke has to be transported long distances. Newcastle coke is sent to Port Pirie, in South Australia. It is first drawn from the ovens, taken to storage platforms, and stacked to

22. "Waste in Coal," p. 193. 23. Mr. J. Jeffries, ex-superintendent, Abermain Collieries Ltd., before Coal Commission, 23rd December, 1925.

24. Set out in correspondence between the manager of the company and the Director of Commonwealth Institute of Science and Industry, 1923-1924. The correspondence was kindly loaned the writer by the manager, Mr. H. C. Langwill.

await shipment in quantities. A steamer becoming available, it is then forked into hopper railway waggons, taken to the wharf, and dumped into the holds. The coke is again handled when stacked at the port of destination, and again at the smelting plants. Hence, the need for a strong and solid coke—which the by-product type of oven has not been able satisfactorily to produce. Here, then, is one of those common paradoxes of industry—an economic gain over the whole industrial field at the cost of an uneconomical waste of raw material—representing an incomplete correlation.

Finally, there is great waste of coal power represented in the absence of a unifying system of electricity distribution throughout the district. The establishment, of the Railway Commissioners' power-house at Newcastle, which directly supplies power to some railway towns, to other centres indirectly through collieries, and to Newcastle and suburbs indirectly through the Newcastle City Council, may be regarded as a step in this direction. But most collieries still meet their own needs (and, in some cases, those of their towns) with no reference to the advantages of correlated, uniform equipments. Thus there are no less than nineteen different voltages in use in the Hunter Valley. Were there set up a central power station within easy reach of every township and colliery in the Newcastle and Maitland districts (Lake Macquarie has been suggested as a suitable centre), many thousands of tons of coal could be saved yearly, and the cost of power much cheapened.

#### B.—THE BUSINESS PROBLEM OF MARKETS.

What is the destination of the coal when it leaves the mines? We have already pointed out<sup>25</sup> that in 1923 about one quarter of the northern coal raised was exported overseas, and the remainder divided almost equally between N.S.W. and the other States of the Commonwealth. By the end of 1925 the overseas share had fallen to one-fifth. The significant fact, however, lies not in the proportionate distribution between N.S.W., other Australian, and overseas markets in any one year, but in the changing ratios over a number of years. During 1924 a total increase of 645,860 tons was recorded in the Interstate and overseas coal export from Newcastle, as compared with 1923; yet the proportion of this figure

<sup>25</sup> Chapter III., p. 36.

belonging to overseas export alone is one of the smallest in a series of diminishing quantities sent abroad during the last six years, which were as follows:—

1920	1921	1922	1923	1924	1925
1,413,348	1,288,470	1,328,202	1,086,710	1,064,927	780,293

This means that, despite the growth of coal production in the Hunter (1924 being a record year), the Valley's overseas export trade in coal is retrogressing.

Of the Australian States, Victoria's share of Hunter Valley coal far exceeds that of any other State outside N.S.W., as it is also greater than the total taken by countries abroad, exclusive of New Zealand. New Zealand absorbs about half as much as Victoria. The other States in order of importance to the Newcastle export trade are South Australia, Tasmania, Queensland and Western Australia.

British ships coming to bunker at Newcastle account for a large proportion of the coal recorded as export to the United Kingdom. The biggest percentage of overseas export, excluding New Zealand, is, however, absorbed on the eastern markets—India, Ceylon, Java, Hongkong, Straits Settlements, the Philippines and Japan. Both North and South America (especially Chili) were, up to 1924, responsible for the next largest proportion, and the Pacific Islands (especially Hawaii, Fiji and New Caledonia) for most of the remainder. That there should be notable decreases in exports during 1925 to the East and to the Americas (e.g., from 175,426 tons to 112,006 tons to the Philippines, from 195,240 tons to 63,227 tons to the Americas), suggests that the causes of the decline are to be traced to conditions at the common centre of production, rather than at the ends of diverging radii of trade, that is, in the Hunter Valley itself. The sole exception would be the case of Chili, to which exports fell off by 105,085 tons, due in part to the new prohibitory tariff.

What are the factors in the demand for coal? As far as Australian trade is concerned, there has been no really free competition in prices for the same grades of coal since a Royal Commission appointed by the Commonwealth Government fixed the prices at 21/9 per ton best screened large and 17/9<sup>26</sup> per ton small alongside wharf at Newcastle. These prices applied equally to

<sup>26</sup> The Navigation Department's harborage rate of 3d., and the Railway Commissioners' crane rate of 6d. must be added to these to get f.o.b.

similar grades of the South Maitland and Newcastle products.<sup>27</sup> The first move since from these price levels took place in November, 1925, when the colliery proprietors added 1/6 and 1/- to the delivery-at-wharf prices of best screened and unscreened large coal respectively (bringing the respective prices to 23/3 and 22/9), while the price of small remained unchanged. A second move occurred in July, 1926, when another 1/- was added to the price of large coal, and 1/- to that of small, bringing prices at the wharf to 24/3 and 23/9 for best screened and unscreened large coal respectively, and to 18/9 for small. A third move, due to an increase in haulage rates by 9d. a ton, occurred in December, 1926, bringing these prices to 25/-, 24/6 and 19/6 respectively.

Competitive conditions are free to cause variations in price on overseas markets. Differences in the rate of profits realised by the various colliery proprietors depend, then, in the home trade entirely upon differences in the costs of production, and in overseas upon both costs of production and fluctuations of market values.

#### HISTORY OF A TON OF COAL.

In mining the heaviest renewal charge in costs is represented in the fortnightly pay-sheet. How important labor is as a factor in cost<sup>28</sup> is seen if we follow the history of a ton of coal from the face of the seam to the ship's hold.

A very varied assortment of labor is required even to get the coal from the seam into the railway "hoppers" at the pit's mouth. In any colliery the miners working on the face will predominate among the various sorts of craftsmen employed. If coal-cutting machines are used, the miners have merely to drill, shoot<sup>29</sup> and shovel the coal, for which the average net contract earnings (after paying for explosives, etc.) may be 32/- per day for a ten-days' pay. The pay of the miners proper is the biggest element in employed personnel cost.<sup>29a</sup> The prices of other types of labor descend by steps to the 6/2 per day of the boy who strikes for the engine-smith. In the hierarchy underground there are deputies (who,

27. The B.H.P. gets Greta and Borehole small coal at 2/6 per ton less than the current rate.

28. Labor charges average over two-thirds of the delivery-at-wharf price of coal. 29. Shot-firers attend to the discharging of explosives. 29a. Some 75 per cent. of the employees in the coal-mining industry of N.S.W. are engaged under contract. Piece rates—disliked in official quarters of the Miners' Federation—are designed to secure an additional payment for every variation from normal conditions of work that causes extra labor or discomfort.

despite their status of supervisors, receive a smaller average daily pay than the miner), machine-men to operate the cutting machines, wheelers to conduct the loaded skips to the hauling cable, clipper or flatter boys who make up sets of skips, road-men who lay the permanent roads and main-roaders who keep them in repair, onsetters and their assistants, who, in shaft mines, put the skips into the "cage," lamp-men, jiggers, set-riders, winch-drivers, and others, whose work is entirely below the surface. The "top-hands," apart from the officials—manager, under-manager, mine-engineer, mine-electrician, surveyors, and clerks—will include banksmen and their assistants to take skips from the "cage," engine-men and engine-drivers, belt-hands to clean out dirt from the coal on the slowly-moving belt, screen-overseer and screen-men to separate the screenings from the large coal, a weighman, waggon-packers, trimmers, waggon-shifters and waggon-shunters, a ganger and fettlers for the rail tracks, a cable-hanger, electrical fitters and mechanics, engineers' smiths, blacksmiths and their strikers, engineering fitters, planers, slotters, borers, millers, shapers, drillers, picksharpener and horse-shoer, horse-keeper, saddlers, carpenters, sawyers, skip-repairers, hopper-repairers, bricklayers, painters, laborers, a storeman, and a messenger.<sup>30</sup>

A Government locomotive draws the colliery "hoppers" over special coal-train tracks to Bullock Island, Newcastle, where they are marshalled for the shipment of the coal by the electric and hydraulic crane-drivers, with whom work capstan-operators, horse-drivers and "hookers-on,"<sup>31</sup> and packing in the ship's holds by the coal-trimmers. All the haulage, but not the craning and trimming, charges appear in the delivery prices of 25/- or 24/6 and 19/6 at the wharf. Other non-personnel charges which may go to make up these prices are royalties, either to the Government or private lessors, waggon hire or repairs for proprietors not possessing their own, way-leave to other proprietors owning rail tracks, or to owners of adjoining leases, inward freight costs and cartage on stores, horse fodder, fuel consumed at the mine, electricity when bought, losses of coal,<sup>32</sup> miscellaneous over-

30. Interviews with Mr. W. Sneddon, of Sneddon's Collieries; Mr. J. Dixon, manager, Glebe Colliery; and late Mr. A. J. Muncaster, shipping manager, Burwood Collieries. 31. Information from Mr. W. A. Stanton, secretary, Carrington Coal and Coke Shipping Union. 32. As when the Railway Department's weights of coal are less than those for which hewing and other rates have been paid at the mine. A loss of 15 cwt. in a consignment from Newcastle to Sydney is typical.

head charges, managing director's salary, directors' fees, and owners' and investors' profits.

The elements in cost so far enumerated do not include the various transport and handling charges incurred before the coal reaches the consuming public—charges which add on an average another 10/- per ton to retail buyers even in Newcastle, and 39/- to retail buyers of large coal in the suburbs of Melbourne. Melbourne manufacturers have to meet an added 17/8 to Newcastle delivery-at-wharf price for both large screened and small varieties, which cost in the truck at, say, Yarraville, 43/- and 37/6 respectively (Dec., 1926).

When it is realised that each of the suppliers of all of the services mentioned up to the point of delivery at the wharf not only normally adopts the attitude that his "cut" from the 25/- (or 24/6) and 19/6 is no just measure of the value of his service, but frequently attempts to enlarge it,<sup>33</sup> it will be seen that the function of management becomes largely, in itself, the maintenance of stable relations among the various costs. From the point of view of those engaged in actual management, the maintenance of stability is more to be desired than increase in the rate of profits—despite the expectations of those who draw dividends, and the objurgations of the critics of the industrial system who do not.

So long as the price of coal as sold by the coal-owners remains at a relatively fixed level, and the payment for most of the labor in mining is on a contract basis, the yearly output of value will have some of the inelasticity of a "work-fund." This means that although there may be considerable accrual of value to the industry as a whole in any one year (as in 1924), the proportions distributed to the various elements of cost are not greatly altered. This, of course, is less true of values gained in overseas trade than on the home market.

#### ECONOMIC RENT IN MINING RETURNS.

On the overseas markets managements may be able to secure additional advantageous margins because of favourable fluctuations in price. At home they may

<sup>33</sup> As when employees have secured improvements in awards since 1920, and when the owners attempted unsuccessfully in 1923 to have wages and contract rates reduced by 33 per cent.

secure differential gains, either by more efficient administration—gains which are true profit—or by advantages in the gift of nature—gains which are economic rent.<sup>34</sup> The differential gains in economic rent may be illustrated<sup>35</sup> by comparing collieries on the Newcastle and South Maitland fields. The Burwood colliery, for instance, produces the best Borehole and Aberdare Extended the best Greta or "Maitland"; both are sold at the one price, 25/- large and 19/6 small, f.o.b. Newcastle. The Burwood colliery is only 8 miles by rail, and pays for haulage in owners' trucks by Departmental engines 1/2¼ per ton, if coal is for export, or 1/8¼ if for local use. The cost per ton to the Aberdare Extended colliery, which is about 37 miles from Bullock Island, is approximately 2/6½ for export, or 3/7½ for local, the Railway Department's haulage rate per mile diminishing with distance. Thus Burwood gains an economic rent over Aberdare Extended, which, however, the latter offsets by a rent accruing from a more easily and, therefore, more cheaply worked seam; geographical advantage favouring the one, geological advantage the other.

#### THE DECLINE OF OVERSEAS TRADE—CAUSES.

The diminution in the overseas trade is undoubtedly to be attributed chiefly to the uncertainty felt by overseas buyers in securing cargoes without loss of time (which means money) when sending ships to Newcastle. It not infrequently happens that ships that have come on long voyages cannot get cargoes for weeks, because of sectional strikes on the coal-fields, and the consequent losses to their owners, who have to pay idle crews, harborage dues, etc., have meant that sources of more regular supply have thereafter been sought. The ship-owners seek to secure themselves by demanding in their contracts with the coal-vendors demurrage at so much per day, after so many "lay-days" (8 days for steamers and 28 days for sailing ships) have expired, and the acceptance of strike clauses which will compensate the buyers. The coal-owners find themselves compelled to accept these conditions if they are to do overseas business. A recent unwillingness to take the risk with a very strict strike clause led to the loss of an order for 600,000 tons of coal, which went

34. "Rent is the outcome of certain favourable conjunctures."—Chas. Gide, in "History of Economic Doctrines." 35. Illustration furnished by the late Mr. A. J. Muncaster (Burwood Collieries).

to Japan, although the purchasers would have preferred N.S.W. coal.

Japan has nothing comparable with the Hunter Valley in quantity or quality of coal (her manufacturers actually buy coal in Newcastle), yet her collieries have already secured a large lump of the trade which once flowed to Newcastle. Another diversion of the trade has followed the opening of the Panama Canal, which has enabled coal-buyers on the west coast of South America to get their supplies profitably from U.S.A. fields, via the Atlantic.

What are the prospects for the export trade? There is evidence to show that other States of the Commonwealth and New Zealand are endeavouring to develop their own resources in power to the uttermost, largely with the aim of being independent of the fickle stream of import from Newcastle. Thus Victorian manufacturers are lending all their support to the development of the brown coal industry at Yallourn and Morwell;<sup>36</sup> in Tasmania the Director of the Geological Survey in 1923 reported to the Government the probability of coals from Preolenna, Catamaran, York Plains, Cornwall, and Mt. Nicholas (all Tasmanian) displacing in the near future the costlier imports from Newcastle;<sup>37</sup> and in New Zealand, where the railways and industries have been dependent mainly on Maitland coal (Welsh coal being imported for locomotives when stoppages occur in the Hunter Valley), a movement has begun for the substitution of hydro-electric power.<sup>38</sup> As an assured and regular supply of raw materials is one of the producer's prime concerns, these stirrings in industrial quarters outside N.S.W., expressing dissatisfaction with economic dependence upon an uncertain source of coal supply, may lead to unexpected devices for substitution—to the ultimate chagrin of the Hunter River Valley.

It is the future, however, of the export trade to countries other than New Zealand and the Australian States that is causing grave anxiety. If the opening of the Panama Canal and the determination of South

36. Sydney "Daily Telegraph," 16.10.24. 37. "Newcastle Herald," 25.10.23. He stated that the retail price of Cornwall or Mt. Nicholas lump coal on the Launceston market was 36/11, as against Newcastle 47/9, and that, taking into consideration the relative calorific values, the margin was in favour of local coals. 38. Sydney "D.T.," 15 and 16.10.24. A board of enquiry was set up in 1925 to report upon the question of the utilisation of New Zealand and other coals on the Dominion railways.—"Sydney Morning Herald," 20.1.25.



American Governments to utilise their own small resources of coal<sup>39</sup> is to mean the loss to Newcastle of most of the central and eastern Pacific markets, what remains for our exporters? There still remain the existing and potentially increasing markets of India and the East Indies and the Philippines. The manufacturers in these countries, however, have no sentimental regard for Newcastle coal, nor for the standard of life of Hunter Valley miners, nor for the pockets of Australian investors, and will readily turn to any assured and cheap source of the fuel they need. Thus, following the operation of the Dawes scheme, and the consequent collapse of the British coal trade on the European continent, English colliery firms began during 1924 to collect orders in Manila for coal at 10/- a ton, and in other Eastern ports at 5/- a ton less than the price of Australian vendors. It is very questionable whether British exporters can maintain such prices with the pressure of demand by the British miners for an improved standard of life always threatening to burst into crises—and a resulting rise in the cost of labor. A more permanent menace to Australian export trade to the East, however, lies in the likelihood of development of Eastern coal resources by cheap labor. Already this is being done in Japan, and it may not be long before China will be supplying not only her nascent steel industry and her already well established filatures, but sending large surpluses of her coal to the nearer Asiatic markets. This development will certainly not greatly be hindered by the decision of the Washington Conference, recognising the impracticability of equating Eastern and Western standards of life, to allow a continuance of a measure of child, woman and sweated labor in the East.

### C.—THE SOCIO-ECONOMIC PROBLEM OF INDUSTRIAL DISPUTES.

Our discussion of the business problem of markets inevitably leads to a consideration of the wider social and economic problem out of which it springs. In no part of the whole field of industry is economic warfare

<sup>39</sup> The Chilean Government has recently imposed a protection duty of one dollar a ton on all imported coal, to be raised to five dollars in five years' time. Newcastle coal exports to Chile, in consequence of this and other factors, have almost entirely fallen away.

normally more intense and bitter than in mining. Conditions in the Hunter River Valley in this respect present merely a cross-section of a universal experience.

In mining populations the roots of this proclivity are deeply planted—historically, in the bitter memories, which have become a tradition, of the Industrial Revolution, and of the subsequent struggles in successive countries for the right of the Collective Bargain; psychologically, in the very nature of mining itself, which subjects the miner to the undistracted contemplation of the contrast between the wealth won and the wage paid, and mining communities to an isolation and combative self-consciousness. The owners of the coal, for their part, seldom live amongst the coal-winners. Even though individually many of them cannot justly be charged as economic oppressors, as a class they inherit a mantle of guilt from their forerunners—a guilt from which the miners as a class are in no hurry to grant them absolution. The present-day investor-owner, who may be sincerely anxious to meet his social responsibilities squarely, naturally resents this never-ceasing imputation of guilt, and in his turn develops an habitual hostility—a psychological defence reaction which leads him to attribute to the miners' "selfishness" every concerted move for the improvement of conditions of work and remuneration.

The miners have fought for and won a status of independence and remuneration more than favourably comparable with that of other manual workers. This acquisition has not allayed the traditional discontent, but rather intensified it. The older men are very conscious that what they enjoy to-day has only bit by bit been wrested from the owners—from the strikes against the 10½-hours day in the early seventies, down through the struggles in 1875 (for 8 hours), 1889, 1890, 1910, 1911, 1913 (for abolition of the afternoon shift), 1916 (for 8 hours, bank to bank), 1917, and 1922. Hence their readiness always to respond to the call for solidarity, often against their better individual judgment. With the absorption of this traditional hostility from the older generations, the younger miners, however, have developed an insouciance and irresponsibility to the industry as a whole, and even to the tactical needs of their own defensive organisation, the virtue of which the older men are by no means willing to concede. But the youngsters are

dominant and assertive, and wield the weapon of "workers' solidarity" very effectively for their own protection against the chastisement of an aggravated community.

It is at bottom, then, this conflict of mental attitudes which accounts for the perennial disputes. The miners, on the whole, are probably no more selfish than the owners—or than most men everywhere — even if the owners are not the ogres of oppression of popular imagination.

It is the multiplicity of sectional disputes, causing irregular and suddenly unexpected stoppages in the flow of coal from the mines, that, in the sum, has harassed overseas buyers to the point of searching elsewhere for their supplies. Nobody is able to predict one day what mines will be lying idle the next—neither shipper (who is generally the owner), nor Railway Department (whose traffic organisation requires delicate arranging), nor the Executive of the Miners' Federation (constitutionally the miners' General Staff), nor even the miner in the mine himself. The sectional strike, indeed, is frequently unwanted by and embarrassing to the Executive of the Miners' Federation, as to all others concerned. The Federation, however, despite its embarrassments, is unwilling to have the responsibility for stoppages assigned wholly to its precipitate members, and roundly denounces the short-time measures of proprietors (who assert, in justification, that trade is poor), as equally responsible for the total of days lost.<sup>39a</sup>

With the existing traditional attitude of hostility to capitalistic organisation — exhibited in varying degree from the doctrinaire Marxism of the younger men to the vestiges of economic liberalism to be found even yet in an occasional grey-beard—the exhortations of the owners to regular output, based as it may be on the generally recognised fact that loss of business to the industry is loss to all concerned, are inevitably suspect, and carry little moral weight. Thus, when Mr. John Brown recently pointed<sup>40</sup> to the very real inroads which the use of oil-

39a. Of the 499 industrial disputes which occurred in the Commonwealth in 1925, no less than 391 were connected with the mining industry, and of these 384 took place in N.S.W. Of the total loss in wages through all disputes in Australia (£1,107,544), no less than £673,018 was due to coal mining disputes in N.S.W., i.e., the industry accounted for more than half the total loss of wages in Australia. (Commonwealth Statistician, Labor Report, 1925). 40. "Newcastle Herald," 5.3.24.

ships was making in the world's coal industry, his statement evoked no thoughtful discussion of the implications of this important economic problem for the Hunter, but was regarded as the usual employers' pronouncement.

#### COMPULSORY ARBITRATION.

The resort to compulsory arbitration machinery has not had any marked effect in preventing disputes, whatever good services it may have rendered in eventually devising workable agreements. Under the Commonwealth Peace Act of 1920 four special tribunals—to deal with Interstate disputes affecting respectively (1) miners and their associates, (2) engine-drivers and firemen in the coal industry, (3) engineers in the coal industry, (4) workers in the coke industry—were set up. The main Coal Tribunal is composed of six representatives of the employers, six representatives of the employees, and a permanent independent chairman (appointed by the Governor-General-in-Council), who is also chairman of the other tribunals. The Tribunal was brought into being to deal with the many disputes arising out of the intricacies of the contract system of wage payment, and deals with general claims throughout the Commonwealth, being called together only if both parties agree as to the existence of a dispute. Though constitutionally only operative in an Interstate dispute, the Tribunal has acted effectively in troubles within a single State.

Both owners and miners complain of the inadequacy of the machinery provided. There are always claims awaiting hearing. The president of the Northern Branch of the Miners' Federation<sup>41</sup> complains that because there are not enough arbitrators a premium is put on striking. "If we assume that arbitration is right," he says, "there is no necessity for strikes. But the men strike because they cannot be heard. Claims listed by the Federation for years have not yet been heard. There is every incentive for lodges to strike through insufficiency of arbitrators."<sup>42</sup>

What to-day are the chief unsatisfied demands of the miners? Many of the troubles arise out of petty

41. Mr. T. Hoare. 42. Interview, 20. 11. 24. Mr. Hoare explained that the threat of a strike, or an actual strike by a lodge demanding to be heard before the Tribunal, actually creates a case of emergency, to which the Tribunal gives attention, to the neglect of other lodges which have waited patiently for their hearing. This puts a premium on striking, and proves the inadequacy of arbitrators.

disputes due to the attitude of manager or deputies to men or boys, or vice-versa, emerging out of the uncertain frontier where the authority of the one and the independence of the other strive to be dominant. But apart from these difficulties of irascibility, there remain several bigger thorns in the flesh. For many years the miners have fought for better and safer working of the mines, but they claim that much more needs still to be done in the interests of safety. The owners' protective organisation (the Northern Collieries' Association) replies that the latest safety appliances are used, that ventilation and general safety are assured, that experiments in these directions are always being made. They are, for instance, experimenting to discover the best electric safety-lamp before installing it generally—a costly business—throughout the fields. The complaints of the miners, they assert, are sedulously engineered for electioneering purposes only.<sup>43</sup>

The officials of the Federation have the further grievance that colliery proprietors generally seek to evade the payment of compensation of men injured at their work. Thousands of pounds yearly are spent by the Northern Branch in legal expenses and specialists' fees in contesting cases on behalf of members.

Again, the officials complain of the difficulty of getting the proprietors to agree to let men share the work in slack times; the owners always insist upon the men being displaced. The onus of maintaining the workless men falls on the Federation. Thus, in 1922, the manager of a Wallsend mine where work became short refused the men the right to share what was available on a roster system—and the Federation was obliged thereby to pay out considerable sums in "victimised pay."<sup>44</sup> The device of the "darg," as imposed by the miners, is only a method of getting a fair distribution of work among themselves. In some parts of a mine coal-getting is easy, in others more difficult. The "darg" is an equal distribution of the available skips among the pairs of men working the mine. It does not affect the total output of the mine, that is, the owners' interests are not affected.<sup>45</sup> The men are

43. Interview with Mr. Jonas, of Northern Collieries' Association, 21.11.24.

44. Mr. Hoare; interview, 20.11.24. 45. For instance, says Mr. Hoare, at Seaham No. 2, where he last worked, the "darg" was 11 skips per pair per day. The miners were prepared to take 12, but the mining equipment was not equal to 12.

prepared to work up to the total maximum output of the mine—so claims the Federation.

#### WHAT WAY OUT?

What are the most hopeful lines along which at least partial solution of these problems may be found? With the growing realisation during recent years that State ownership of industry gives very little new help in the solution of difficulties between management and employees, there is to-day but small enthusiasm amongst the miners for nationalisation. And even the most class-conscious critics of capitalistic enterprise in executive positions in the Federation question the miners' present ability satisfactorily to run the industry with democratic machinery. It is undoubtedly realised, though never publicly confessed, that factional and personal objectives would endanger the economic working of a socialised or syndicalised control.

Failing these more radical methods, there is being urged, however, that some system of pooling the work of the industry be adopted in the interests of the miners as a whole. The owners claim that they are doing their best for the men, but cannot avoid the variations in demand for particular coals from particular collieries. The separate ownership of collieries obviously enables the owners of mines whose coal is in full-time demand to disclaim responsibility for the insufficiency of work in more unfortunate collieries. It is just this disclaimer against which the miners protest. If the industry as a whole, they claim, tolerates the part-time mine, thereby needing spasmodically a reserve of labor, the maintenance or employment of the labor in slack times should be a charge upon the resources of the industry, and not upon the Federation. At present the miners in work bear nearly the whole incidence of a support-tax for the reserve.

The complaint of the miners seems here to be well justified. The proprietors would inevitably regard a pooling scheme as a further encroachment upon their rights as free enterprisers, and as but one more embarrassment to legitimate business. But reform in the industry will probably most fruitfully move along such lines—particularly if the Miners' Federation itself be saddled with most of the responsibility in the pooling

arrangements, on the principle that responsibility induces understanding. It may be asserted, in support of such an arrangement, that while no machinery will eliminate the impulses which, among either owners or miners, produce irrational and irresponsible — and, therefore, anti-social—behaviour, any scheme to ensure *fuller collaboration in responsibility* is likely to contribute to social welfare.

But obviously the continuance of mutual responsibility is quite incompatible with acceptance of the class-war doctrine. The miners in their mass attitude vacillate between its acceptance and rejection. They suffer from a sub-conscious conflict between two opposed tendencies. This conflict is kept alive by the small minority of earnest and avowedly "class conscious" warriors in the ranks, who exercise an influence altogether disproportionate to their numbers. Only a resolution of this Hamlet's impasse will relieve the industry of its malaise. That means acceptance or rejection once for all of the mandate of the ghost of Marx. And equally obviously it is useless to talk of mutual responsibility unless and until the choice be in favour of rejection. Three alternatives might induce such a decision—(i.) the spread of education in critical analysis of economic institutions and theories of social and economic reform; (ii.) re-action of ordinary common-sense judgment against the overstatement and exaggeration of the Marxian case; (iii.) realisation of the cumulative losses arising from the present position, and recognition that an improved capitalism, with its tangible proceeds, is likely to render a decided balance of utility over an unproved communism. Controversial education might, of course, lead to a more convinced acceptance than ever of the class-war gospel; but that is improbable. In any case, mass education of such a kind is a long process, and is not likely to contribute much in solving the immediate problem. The form of education which facilitates the conscious analysis of economic problems is likely always to be accepted only by the rare few; but that form which comes of gradual realisation of the fundamental necessities of economic life is accepted by large masses as a process of adaptation. At bottom the majority of the miners of the Hunter River Valley are as quick to size up the realities of a situation as other sections of the community, and are, therefore, not likely to be stampeded into revolutionary fervour;

nor are they likely to lag much behind other classes in recognising the extent to which continued friction is limiting their possible share of the proceeds of industry. Collaboration on the part of the miners along the lines suggested above is, therefore, no unreasonable expectation. The duty first devolves upon the proprietors, however, to give evidence of a joint willingness to make the industry as a whole responsible for regularity of employment, for the elimination of unnecessary wastes, and for the acceptance of the policy of high wages as economic wages.

### SUMMARY.

We may now summarise our chapter. In the opening brief review of the history of the mining industry it was shown that until the early nineties mining was confined to the Newcastle and Tomago measures, but that since 1889 there has been an amazing growth both in collieries and population on the South Maitland field. There then followed a description of the distribution and relative production of the mines on the various fields. Following a brief reference to the adequacy of the four functional factors of production—capital, labor, enterprise, and natural resource—three of the main sorts of problem which the industry faces were treated in turn in some detail.

It was shown that the engineering problem of waste had two sides—(1) wastes involved in winning, and (2) wastes involved in using coal. Owing to defects in mining engineering some 57 per cent. of Borehole coal had already been lost, and it was likely that that was likely to be the fate of 50 per cent. available in the Greta seams. Suggested methods and devices for preventing further losses were discussed. Wastes in the use of coal were shown to be associated with (a) boiler plants, for the more intelligent use of which the installation of certain mechanical devices is desirable, (b) coke manufacture, in which, in the existing stages of applied chemistry or technology, the waste of valuable gases is inevitable if a coke fit for transport is to be produced, and (c) the absence of a uniform system of electricity production and distribution throughout the industrial areas.

We then turned to a discussion of the business problem of markets. Attention was first drawn to the disquieting decline in the export trade. This involved



discussion of the factors in the demand for coal on local, Australian and overseas markets. It was shown that the stabilising of the price on the home markets throws responsibility for enterprisers' margins solely on costs of management (profit from efficient administration, rent from differential natural advantages), but that overseas further advantages might be gained from variations in market values. We further saw how the costs of a ton of coal are produced and that the problem of management, per se, is how economically to stabilise relations between the contending claims of the cost elements. From the standpoint of the industry as a whole, the prevention of further decline in the export trade was desirable. The loss of trade, both Interstate and overseas, was shown to be attributable to buyers' uncertainty in getting regular cargoes, and it was declared that the district was likely to suffer a real and permanent loss as these purchasers found substitute sources of supply.

Finally, we devoted attention to the socio-economic problem of disputes in the industry. The mining communities of the Hunter, it was stated, exhibit the combative traits of mining communities everywhere—traits which have both historical and psychological origins, and which have produced a traditional mental attitude of hostility to the owners of the coal, and of the capital sunk in the industry. This hostility has evoked a psychological defence reaction on the part of the latter. Hence, it was shown, the stage is always set for conflict, which finds expression, apart from the troubles which may involve a whole field or even the whole industry, in the never-ceasing sectional stoppages. The resort to compulsory arbitration had not reduced the number of disputes, and, it was stated, the machinery for their settlement was quite inadequate. Finally, we discussed some of the conditions of the industry which leave the miners still dissatisfied—the provisions for safe-working of the mines, and the burden which their Federation is obliged to carry in contesting compensation cases with the owners, and in maintaining their members displaced when trade slackens. Short of forms of socialisation or syndicalisation—for which the majority of the miners are unfitted—the most fruitful line of reform would seem to be in some arrangement for the pooling of the resources of employment in the industry, with the miners' own organisation exercising the biggest share of responsibility and control.

APPENDIX No. III  
HUNTER RIVER VALLEY COLLIERIES

Colliery or Pit.	Owned by	Approximate Number of Men Employed.	Remarks.
<i>Newcastle Field—</i>			
Waratah . . . . .		305	
West Wallsend ..	Caledonian Collieries Ltd.	342	Closed (temporarily?)
West Wallsend Extended .. ..			
Killingworth .. ..			
Burwood .. .. .	Scottish - Australian C.M. Coy.	371	
Lambton .. .. .		330	
Lambton "B" Durham .. .. .		414	
Duckenfield & Back Creek .. .. .		J. & A. Brown	74
		153	
		299	Closed (temporarily?)
Dudley .. .. .	Dudley C.M. Coy.	307	
New Lambton (Ebbw Vale) .. .. .	N.L. Land and Coal Coy.	198	
Wallsend "C" .. ..	Newcastle - Wallsend C. Coy. Ltd.	425	
South Wallsend ..		43	
Jesmond .. .. .	F. & H. Langwill	38	
Stockton-Borehole ..	Stockton - Borehole Collieries	442	
Redhead (Burwood Extd.) .. .. .	Redhead Collieries Ltd.	360	
Seaham No. 1 .. ..	Abermain Seaham Collieries Ltd.	298	
Seaham No. 2 .. ..		514	
Shortland .. .. .	J. Ruttle	85	
Northern Extended	Estate of A. Sneddon	77	
Northumberland ..	F. Croft	28	
Pacific .. .. .	Pacific Coal Coy. Ltd.	114	
Rhondda .. .. .	Wm. Laidley & Coy. Ltd.	60	
South Teralba .. ..	Lane, Dawson & Coy.		
Lymington .. .. .	Lymington Collieries Ltd.		Fire in workings
Belmont .. .. .		35	
Victoria Tunnel ..	Newcastle C.M. Coy. Ltd.	117	(inc. also men in Dixon's, Hillside, Happy Valley, and Glenrock
Cardiff Borehole ..		145	
Wallarah (Catherine Hill Bay) .. .. .	Wallarah Coal Coy.	488	
Newcastle Myall ..		14	

Colliery or Pit.	Owned by	Approximate Number of Men Employed.	Remarks.
<i>Tomago or East Maitland Field—</i>			
Ashtonfields .. ..	Longworth	126	
<i>Maitland Field—</i>			
Aberdare Main ..	Caledonian Collieries Ltd.	2599	
Aberdare South ..			
Aberdare Central ..			
Aberdare Extended			
Pelaw Main .. . . .		715	
Richmond Main ..	J. & A. Brown	802	
Stockrington .. . .		71	
Bellbird, Nos. 1 & 2	Hetton-Bellbird Col- lieries	538	
Hebburn, No. 1 ..	Hebburn Ltd.	802	
Hebburn, No. 2 ..		250	
Neath .. . . . .	Wickham & Bullock	110	
Cessnock .. . . .	Island Collieries	564	
Kalingo .. . . . .	Ltd.	39	A sinking shaft
Greta Main .. . .	Greta Main Coal Coy.		
Ayrfield, Nos. 1 & 2	Ayrfield Coal Coy.		
Great Greta .. . .	West Greta Coal Coy.		
Stanford-Merthyr ..	East Greta C.M. Coy.	404	
Stanford - Merthyr, No. 2 .. . . . .			
East Greta .. . . .			
Pelton .. . . . .			
Abermain .. . . .	Abermain Seaham	627	
Abermain Extended	Collieries		
<i>Greta Field—</i>			
Central Greta .. . .	Central Greta Coal Coy. Ltd.	80	
New Greta .. . . .	Kirton & Earnshaw Ltd.	211	
South Greta .. . .		150	
Rothbury .. . . .	Rothbury Estate	243	
Whitburn .. . . .	Newcastle Coal Min- ing Coy. Ltd.	388	
<i>Muswellbrook Field—</i>			
Muswellbrook .. . .	Muswellbrook Coal Coy. Ltd.	130	
St. Heliers .. . . .	St. Heliers Coal Coy. Ltd.	30	
Lupton Park .. . .	Lupton Park Colliery Syndicate	14	Not work- ing
Overton .. . . . .	Overton Colliery Coy. Ltd. (on co-opera- tive basis)	14	Not work- ing

## CHAPTER VI.

### LIVELIHOOD FROM MANUFACTURE

#### MANUFACTURAL INDUSTRY IN THE VALLEY.

"There can be no doubt," wrote Dr. Lang, "that N.S.W., sooner or later, will become a great manufacturing country; and it is equally evident that Newcastle will become the principal seat of its manufacturing industry."<sup>1</sup> In 1875, when these words were written, Newcastle, with its small mining and shipping population of 7580, was little bigger than the Wollongong of to-day. Dr. Lang's prediction is fast being realised. The city and its suburbs, with their present population of round about 100,000 souls,<sup>2</sup> have since grown into a "seat of manufacturing industry," which can claim in this respect, if not the position of principal importance among Australian cities, at least the distinction of numbering amongst its manufactures the largest single enterprise<sup>3</sup> in the Commonwealth.

For the reasons discussed in our third chapter, the geographical facilities of the port have inevitably produced a miscellany of activities. Not until the rolling of steel began in 1915, however, did the industry of the district receive a characteristic stamp. Since that year the production of iron and steel has become the great pivotal activity around which are fast clustering a mixed family of direct offspring and relations of varied degree. Thus, apart from the key manufactures of iron and steel in their various forms for industrial or merchant use, other large works employ these products as their raw materials in the making or repairing of machinery, ships, bridges and other metal structures, and for wire-netting, wire, nails, galvanised iron and locomotive axles and tyres.<sup>4</sup> Benzol and tar (with its constituents — sulphate of ammonia, carbolic acid, creosote, fuel oils and pitch) are by-products of iron manufacture. Independent plants exist throughout the district for the production of sulphuric acid, superphosphates, and cement, for the carbonising of

1. "Historical and Statistical Account of N.S.W." (1875), p. 290.  
2. 93,050 at end of 1925. 3. The Broken Hill Proprietary Co. Ltd.  
4. In the first months of 1925, a new wire-rope factory, in which the B.H.P. holds an interest, was opened at Port Waratah.

coal for gas and coke, for the ginning of cotton, for brewing and the milling of flour and timber, for the making of soap, clothing, furniture, foods and drinks, and miscellaneous commodities, for the quarrying of gravel, blue metal and clays (with the making of both building and furnace bricks), and the generating of electricity. In nine country centres throughout the Valley there are factories for the production of butter and other dairy commodities, in one a large meat chilling and freezing works, and, just on the outskirts of Newcastle itself, a large abattoir equipment.<sup>5</sup>

Manufactural industry in the Hunter Valley is thus fairly widely representative in the assortment of its production.

#### THE IRON, STEEL AND BY-PRODUCTS INDUSTRY.

The manufacture of iron and steel, and of the by-products connected therewith, is conducted by the Broken Hill Proprietary Company Limited—a great public joint-stock enterprise, of upwards of 10,000 shareholders — which, with a paid-up share capital of £2,687,708 (authorised £3,000,000), has represented in its various plants, mines and quarries in N.S.W., Victoria, South Australia and Tasmania, and in the services connecting them, a total capital investment of £5,898,850.<sup>6</sup> After having reclaimed an area of 1225 acres of swamp<sup>7</sup> at Port Waratah, on the banks of the Hunter, about three miles

5. Managed by an ad hoc public authority — the Newcastle District Abattoir Board.

6. The company's total book assets at 31st May, 1925, were £8,536,672, inclusive of shares in other companies, Government debentures, and raw materials. The B.H. Proprietary was the original Broken Hill Mining Coy., formed in 1885, from which other companies on the Barrier are offshoots. To-day it occupies but a secondary place as a mining enterprise, producing lead and zinc concentrates from its Broken Hill ores. From the financial details made available by the Company, it is impossible to discover how much profit is derived from Broken Hill operations, and how much from those at Newcastle. Inclusive profits or losses during six recent years have been as follow:—

Year.	Gross Profit.	Deben- ture Interest.	Deprecia- tion Written off.	Net Profit or Loss	Dividends Paid
May 31.					
1920 .. ..	2650,508	249,427	273,508	2517,663	2315,000
1921 .. ..	589,478	76,391	161,755	351,332	341,108
1922 .. ..	388,681	131,143	154,243	103,300	92,054
1923 .. ..	180,445	131,227	155,304	(106,086 loss)	Nil
1924 .. ..	600,002	121,546	299,118	279,339	NM
1925 .. ..	897,582	114,160	282,518	379,307	122,644

With the necessity of paying interest on, and providing a sinking fund for £521,500 of 6 per cent. and £1,180,000 of 7 per cent. debentures outstanding at May 31, 1925 (reduced somewhat since), very high profits have to be made in order to pay a reasonable dividend on the £2,687,708 of paid-up £1 share capital. 7. 9 million cub. ft. of timber in 25,000 piles were used as foundations.

from Newcastle, it began its manufacturing operations in April, 1915. Since then there has grown up on this site a vast equipment of great electric cranes, blast smelting furnaces, open steel-making hearths, steel-rolling mills, steel, brass and direct metal foundries, "blowing-in" and other huge machinery, coke ovens and tar distillation plant, great bins for ores and other heavy raw materials, pattern-making and other machine shops, electric power generating plant, wharves, etc., etc., with some 26 miles of standard gauge railway and 3¼ miles of narrow gauge track. In 1921, the last full working year, 5739 men were employed directly within these works.<sup>8</sup> If to this figure be added the 700 employed where the ore is mined in South Australia, another 150 at various quarries, 500 on the company's and other steamers, 1200 in the allied industries of galvanised iron, wire and nail making, and 3500 in the supply of the company's coal<sup>9</sup> and other materials, this one enterprise is seen to be very directly responsible for the employment of some 11,700 men.

For the making of iron, 800,000 tons of ore are railed each year from Iron Knob, Spencer's Gulf, South Australia, over 34 miles of the company's own lines to its own ships, which, in turn, bring it right to the wharves at Port Waratah, over a sea-route of 1159 miles; 193,000 tons of limestone are shipped or railed from quarries in Devonport (Tas.), Taree and Attunga (N.S.W.); 26,000 tons of silica rock (sandstone) are hewn at Gosford (N.S.W.); and a small quantity of phosphate rock—3000 tons—is brought from Nauru and Ocean Island. The South Australian ore is of a continuously even quality, and compares more than favourably with the richest American deposits. For the steel-making process other substances—magnesite, chrome ore, fluorspar, dolomite, ferro silicon, manganese, phosphorous and aluminium—are also shipped or trucked to Port Waratah. Despite their great bulk and weight, it pays to bring these materials to the source of the coal.

#### MAKING IRON.

Raw materials for smelting are discharged from the ships directly into the three great blast furnaces,<sup>10</sup> or into large storage bins or containers, lying parallel to

8. During the last six months of 1924 the number varied between 4,883 and 4,760.

9. 16,800 tons consumed weekly.

10. A smaller furnace is also operated at times.

the wharves. The furnaces are identical with those installed in the most up-to-date of American plants, one with a daily producing capacity of 500 tons, and two of 450 tons, all together, each week, capable of producing 9800 tons of molten iron. Together with the electrical "grabs" and chargers, and the five huge blowing engines, which drive, and the equally imposing "ovens" which heat the air blast, the blast furnaces are an admirable illustration of the modern "complex tool with a fixed relation of processes performed by its parts,"<sup>11</sup> which we call the machine. Surprisingly few men are required to work this vast mechanism. Human control and judgment are still, of course, the essential factors, as, for instance, in determining the proportions of the materials—always a delicate business—which feed the great retorts. A typical "charge" comprises about 5 tons of coke, 17,000 lb. of iron ores, 4000 lb. of limestone, 400 lb. of sandstone, and 1600 lb. of steel slag. Yet all this is manipulated with swiftly-gliding electric vehicles, obedient to the command of a few unobtrusive human beings! Apart from the pig iron derived in the process of smelting, there are produced each day some 55,000,000 cubic feet of waste gas, which is used for heating boilers about the works, and large quantities of iron slag (1500 tons from each furnace per week), which is either "granulated" for light filling about the plant, or stored in pots until bought for concrete or road-making purposes.

#### MAKING STEEL.

A part of the iron thus produced is cast in "pig" mills for sale by the company in some eight grades for foundry purposes. But the main purpose of the blast furnace is the production of basic iron for the making of steel. Steel is made at Port Waratah by the method of the open hearth. In the imposing equipment used there are nine 60 to 70-ton furnaces (fed by 34 large gas-producers), "cupolas" for calcining, and plants for crushing certain of the materials which co-operate with the basic iron, and two large "mixers."<sup>12</sup> Electrically-

11. J. A. Hobson's definition in his "Evolution of Modern Capitalism."  
 12. These are chambers lined with magnesite brick and a silica roof, each holding 350 tons of pig iron (from the blast furnaces), which it keeps in a molten condition, by means of burners using heavy fuel oil, to ensure a greater regularity in the supply of hot metal to the steel furnaces and also a more constant chemical composition. Between the necessary periodical repairs, 70,000 tons of molten iron pass through each "mixer."

driven mechanical charging machines feed to the furnaces the dry mixture (say 8 tons of limestone, 10 tons of iron ore, and 18 tons of steel scrap, with coke, chrome, and other refractories) and travelling overhead cranes the "drink" (48 tons of molten "pig") with a comical, because colossal, exaggeration of human solicitude. Human invention has here done much to transfer a heavy load of exacting work to the machine, but it has far to go yet. It is still the workman of exceptional robustness who can remain unaffected by the excessive heat atmosphere produced by a furnace temperature of 1800 degrees C.<sup>13</sup>

"Scrap" iron and steel is an important element in cheapening the cost of new steel production. The company will absorb as much as it can get, but Australia, with its small and widely scattered manufacturing industry, is a poor field for supplies. By using the croppings, pit waste and "skulls" about its own works, and the small amounts purchased, it is enabled to bring the scrap charge up to 25 per cent. of the basic metal and other substances employed. The steel is tapped from the furnaces into 75-ton ladles, and poured thence into ingot moulds which are run by narrow-gauge to soaking pits and stripped. A single furnace may, on occasions, produce 280 tons in 24 hours.

#### SHAPING STEEL.

Then comes the process of rolling—a truly wonderful spectacle! After re-heating to an even temperature throughout, the plastic, orange-heated ingots, each weighing about  $3\frac{1}{4}$  tons, are with uncanny precision levered and guided back and forth by two great hands of steel over a floor of small moving rollers and forced beneath the rollers of the blooming mill—rollers which a 13,000 horse-power steam engine makes irresistible with crushing power. This mill has a capacity to produce up to 10,000 tons of steel per week. The elongated metal "blooms," after another re-heating, may then be fashioned into rails, bars of various sizes, rods, fishplates and assorted steel shapes. In the rail mill, for instance, they are rolled by 11,000 h.p. pressure into billets, large beams, and rail lengths of about 120 feet. The rails are passed along a runway table and cut into lengths by

13. "I do not concur."—Manager's marginal comment in checking draft of this chapter.



a hot saw, passed to cooling beds, straightening press, and drilling and ending machines, and then stacked — all this production, at the rate of 3500 tons a week, being accomplished, except for a little levering, by purely mechanical means!

In what are known as the merchant mills, three sets of rollers—the 18-inch, 12-inch and 8-inch mills—produce light rails, small structural shapes, and “merchant” bars from billets rolled on the larger mills; another, called the rod mill, passes billets through a series of 16 sets of rolls to produce rods which are coiled in lengths up to 2500 feet for the wire-drawing and nail-making industries; another, the fish-plate mill, cuts, punches, notches, oils and bundles ready for despatch the various sorts of fishplates required for rails. The 18-inch, 12-inch and 8-inch mills between them can produce up to 3000 tons a week, the rod mill 2500 tons, and the fish-plate mill 500 tons. Other sorts of production are conducted in the foundries—the iron foundry producing iron castings up to 30 tons weight, the steel foundry steel castings up to 20 tons (including “cheese” ingots for tyre and axle manufacture by the Vickers-Commonwealth Steel Products Coy., at Waratah, four miles away), the direct metal foundry for smaller iron castings up to the rate of 200 tons a week, and the brass foundry.

#### THE BY-PRODUCTS.

Coke is an important agent in both iron and steel making, more especially in the smelting of the ore in the blast furnaces. The Steel Works make their required 7000 tons per week in three batteries of 224 ovens of the Semet Solvay recovery type, which, to produce this quantity, carbonise about 11,000 tons of Borehole and Burwood coal. As an adjunct to the coke ovens, a modern by-products plant recovers every 24 hours some 14,000 gallons of tar, 15 tons of sulphate of ammonia for use as fertiliser, 3500 gallons of benzol motor spirit, 1400 gallons of concentrated liquid ammonia for refrigerating purposes, and 17 million cubic feet of gas for use in the works, as well, either directly or indirectly from tar, carbolic acid, creosote, pitch, fuel oils, naphthas and toluol. Ammonia and its compounds are got by literally scrubbing the gas from the coke retorts with water, which absorbs it. The sulphate, which has a particular value for rejuvenating soils that are light and sandy, is preci-

pitated as crystals when the distilled gaseous ammonia is passed through saturators containing sulphuric acid.<sup>14</sup> Fifty years ago scarcely 2000 tons of ammonium sulphate were manufactured throughout the whole world; to-day agriculturalists create an annual demand for some 2,000,000 tons. Benzol is extracted both from retort gases and tar, from the former by being scrubbed with boiling tar oils and then, as with the tar itself, distilled. The distillation is carried automatically through an un-interrupted series of operations—another striking illustration of the automatism of machinery in the most recent stages of its evolution.

It will readily be seen that the successful co-ordinating of machinery and processes in so vast a manufacture demands managerial ability of a high order, not least in selecting the number, character, and grades of directive power and operative skill of the required personnel, and in maintaining their loyalty. Where division of labor is multiplied to the degree seen in these works, and machinery made to work indefinitely on tasks which quickly exhaust human strength, continuity of operation becomes a cardinal requirement of manufacture. The search for the point of maximum economic return becomes a problem of trial and error in pursuit of a numerical ratio of processes and individuals.

#### MARKETS FOR B.H.P. PRODUCTS.

What are the destinations of the B.H.P. products? They are to be found almost solely within the Commonwealth. The chief purchasers are the various Government railways in their demand for steel rails and billets for forging. Wire-drawing firms, such as Rylands Bros. (now merged with the B.H.P. itself) adjoining, and Lysaghts Bros., of Sydney, are supplied with wire rods, and sheet-rolling firms, such as Lysaght's Newcastle Works Ltd., also a neighbouring enterprise, with sheet bars, which the latter firm rolls into sheet iron for galvanising and corrugating.

During the war the bloom mill was adapted to roll 10,000 tons of steel plates for the construction of Commonwealth Government steamers at Walsh Island, Williamstown, etc.,<sup>15</sup> but as a peace activity plate-rolling does not pay—hence the importation of plates for ship-

14. Supplied by the Sulphide Corporation Ltd., of Cockle Creek.

15. During the same period the works rolled and shipped to England 17,000 tons of munition steel and 3,600 tons of rails for war purposes.

building purposes by the Walsh Island Government Dockyard. The merchant bars—rounds, flats, angles, tees, squares, octagons, spring steel, etc.—are supplied to merchants and manufacturers direct. Large quantities of specially prepared blooms and “cheeses” (as already stated) are delivered to works at Waratah for the making of engine and other tyres and axles, colliery skip wheels and other steel castings, and much steel and pig iron goes to Victoria and South Australia for the construction of harvesters and other agricultural machinery.

So much for the major commodities. Certain parts of the by-product manufacture are controlled separately by a subsidiary company called the B.H.P. By-Products Pty. Ltd. The parent company delivers to the subsidiary all its tar. The distilled and residue products—oils, creosote, naphthalene—are sold all over Australia, and some are exported. Naphthalene, for instance, is taken by furriers for skin preservation. Crude tar and four refined grades are bought by municipal and shire councils. A recent advance in the subsidiary company's enterprise has been the acquisition of five mobile machines for the application of tar either for the surfacing of roads or their construction by means of the “penetration” method. Local governing bodies in various parts of the State—as far north as Lismore and south-west as Junee—are finding it economical and expeditious to have the B.H.P. By-Product Co. to send its tar, its machinery, and its working staff on to their roads to do work the councils themselves cannot do. The subsidiary company also handles the waste slag from the blast furnaces. This is crushed, graded to size, and sold for road-making purposes and as a concrete aggregate.

For these by-products the subsidiary company has its own selling agencies throughout the Commonwealth and New Zealand. The parent company, however, handles other by-products, such as ammonium sulphate, benzol and solvent naphtha, which are produced in plant separate from that of the tars and oils. Fertiliser companies buy and circulate among consumers the sulphate of ammonia—produced at the rate of 120 tons a week. It is used mostly on the sugar-cane fields of Queensland, and generally in mixed manures, the Australian Fertiliser Coy., of Port Kembla, being a buyer of large quantities. Some also is exported to Japan. Over a million gallons of benzol, which has a special value as a motor spirit

because of its high calorific value per gallon, rather than per unit of weight, is distilled annually, and marketed all over the Commonwealth. In Sydney and Newcastle the company has its own selling organisation, sedulously fostering the popularity of benzol, which is a relatively new commercial motor fuel.<sup>16</sup>

Although most of the nearby firms which produce specialised iron and steel products are independent of the B.H.P., they are rightly, in so far as they need its raw materials, to be regarded as contributing to the localisation of the iron and steel industry in the Newcastle district. The growth of localisation is of great interest to the student of economics. Here in Newcastle he may already observe the results usual to geographical concentration in like activities — the creation of a local market for special skill, reacting in turn to develop the specialisation of the district, which again may cause the welfare of a large population to be subject to the vagaries of demand for its special type of product. Thus Newcastle had already become far enough specialised as an iron and steel centre to experience a measure of paralysis with the closing of the steel works during 1922, involving a reduction of the employed personnel of the six largest firms<sup>17</sup> of the district from 7953 in October, 1921, to 2343 by August, 1922. A brief descriptive analysis of these specialised works extending out from the B.H.P. nucleus will, therefore, be warranted if it illuminate the process of localisation.

#### GALVANISED PRODUCTS.

One group of specialised products includes all the various grades of galvanised wire for fencing purposes (including barbed wire), nails, wire-netting (especially for protection against rabbits), strands (wire clothes lines), and wire gates. These are made by Rylands Bros. (Aust.) Ltd. (capital £300,000), which was a branch of the largest enterprise of its kind in the world—Rylands Bros. Ltd., of Warrington, Lancashire, founded as far back as 1803, in the infant years of the English base metal industry. The local company, however, has just recently (April, 1925) been merged into the B.H.P. by the latter's purchase, with 215,433 B.H.P. shares, of the

16. Interviews with Mr. L. J. Griffiths, assistant-manager, B.H.P., and Mr. J. L. Cowie, manager, B.H.P. By-Products Pty. Ltd.

17. Steel Works, Rylands, Walsh Id., A. Gontinan and Co., Commonwealth Steel Products Co., Ltd. and the Galvada Corporation.

whole of its shareholders' scrip. Its normal weekly output is about 800 tons of wire of various sorts and 300 miles of netting, which is sold directly to merchants, either locally, or in the main ports of the Commonwealth and New Zealand. The making of wire-netting involves five distinct stages: (1) the "pickling" of the rods (received from the steel works) in sulphuric acid for the removal of scale, washing, dipping in boiling lime, and drying; (2) the drawing of the rods into wire, by a revolving drum, through chilled or steel dies; (3) the annealing or softening of the wire by enclosing it in hermetically sealed cast-steel pots, which are placed in a furnace heat of 850 degrees C. for six hours, and then cooled off; (4) the weaving of the wire on looms (with a mesh from  $\frac{1}{2}$  in. to 4 in., and any width up to 8 feet) which take the wire already wound by special machines (a) into "springs," (b) on bobbins, and (c) in the form of selvage; and (5) further "pickling," and galvanising in a preparation of pure zinc. Nail, barbed wire and strand making are done in special departments, and even a surplus of black varnish is produced for the market from the company's own tar distillation plant.<sup>18</sup> For all this work nearly a thousand men are employed. With the gradual growth of this enterprise a larger and larger number of general workers are becoming equipped with a new technical skill.

Germane to this industry is that of Messrs. Jno. Lysaght (Aust.) Ltd.<sup>18a</sup> in their production of sheet iron and steel. This firm, adjacent to Rylands, is a branch of John Lysaght Ltd., of Bristol, Newport, Scunthorpe and Wolverhampton, and has no relation to the wire-netting firm of Lysaght Bros., of Sydney. The Newcastle works began producing in 1921. The 1925 output was about 20,000 tons of material, the total annual tonnage showing a marked increase each year since the company's inception. The chief product is galvanised iron, flat and corrugated, of which about 400 tons leave the works every week. Other specialties are black sheets for motor-body work, and special sheets for deep-stamping (used for milk cans, etc.), made from a low carbon or soft steel. The main market is N.S.W., but small quantities are also sent to Victoria, Queensland, and South Australia. A labor force of about 400 is employed, about one-third of whom are Englishmen, specially skilled in the manufac-

<sup>18</sup> Interview with Mr. M. Howarth, of the firm. <sup>18a</sup> Now known as Lysaght's Newcastle Works Ltd.

ture, whom the firm brought out when the works began. The raw material for the works are bars bought from the B.H.P. They are first cut into suitable lengths, heated blood-red in a furnace, and then passed several times through a pair of rolls—a process involving exceedingly exacting manual labor. Then follow the stages of annealing, “pickling,” and galvanising, with corrugation by a machine capable of dealing with 450 tons a week. The sheets are then packed in bundles or cases until called for by purchasers.<sup>19</sup>

#### STEEL TYRES AND AXLES.

The intricate and delicate processes by which the tyres on the wheels of a railway carriage are made are seldom, of ever, pictured by the incurious railway passenger. Were he compelled to trace step by step their manufacture at the works of the Commonwealth Steel Products Coy., at Waratah, he would be left marvelling that any man could remain blasé in the presence of the products of our complex modern culture. At the Waratah works may be seen a modern electric melting and steel refining equipment. This specialised plant exists to convert almost any kind of good-grade scrap and pig iron into steel of the high quality required for the manufacture of tyres. The company, as before stated, also purchases high-grade acid steel from the B.H.P. The scrap for conversion into the required steel is brought to the works in trucks, sheared into convenient lengths, loaded into boxes, and stacked. Parcels of about 6½ tons are then charged by manual labor, aided by an overhead electric crane, into the electric furnace, whose current supply is thereafter automatically controlled. A skilled melter removes impurities by raking off a basic slag, which he has created by the addition of lime, iron ore, and other materials. After testing, the necessary addition of carbon is made, the resultant steel then de-oxidised and de-sulphurised with more slag, and then tapped and ladled into ingots. The ingots are sliced into “cheeses,” the slicing machine cutting from 36 to 40 tons every 24 hours. These are heated in a furnace of 1,100 degrees C., placed under a 2,000-ton press for flattening and punching, taken to successive hammering machines, re-heated, hoisted by mono-rail to the external, internal and side rollers of the tyre mill—preciseness of temperature being of the utmost importance in preventing varying degrees

19. Details checked by Manager, Mr. W. S. Whitmore.

of shrinkage, coarseness of grain, low tensility, etc. — again subjected to furnace heating, tested, painted, and despatched. Such is the complex birth-history of the innocently simple circle of steel on a railway wheel!<sup>20</sup>

The company's customers are chiefly the Commonwealth and State Railways. Upwards of 580 men are normally employed for the work. During 1924 the company's powers were extended by the issue of 50,000 shares to the English firm, Messrs. Vickers Ltd., which brought to the industry extra capital to the extent of £50,000, thus making possible the installation of new machinery, and the appointment of special engineering experts. The company is now known as Vickers-Commonwealth Steel Products Ltd.

#### SHIP-BUILDING AND ENGINEERING.

Just opposite the B.H.P. Steel Works, at the confluence of northern and southern arms of the Hunter, lies Walsh Island, once a mud bank, built up by dredging silt, now the site of the N.S.W. Government's Ship-building and Dock Yards. This enterprise, founded in 1913 as a result of the Commonwealth's resumption of the State-owned Cockatoo Island, Sydney, has experienced a mixed career of triumphs and reverses. Here we wish briefly to describe its work as a specialised extension of iron and steel enterprise. The plant was originally set up in the belief that it would share in the Commonwealth naval programme construction; hence its extensiveness and general excellence. The hope of getting cruiser construction has not yet been realised, and other types of activity have failed to give the plant adequate employment. Much important ship-building, however, including the six Commonwealth standard ships of from 5,500 to 6,000 tons constructed during the war (when 2,500 men were employed), and ferries,<sup>21</sup> tenders, launches, tugs, dredgers and barges, lies to the Island's credit. The Yard is equipped with building berths and cantilever and over-running cranes to enable the building of ships up to 750 feet long and of 15,000 tons' burden. In the absence of orders for this bigger work, repairing of all sorts of craft has become a major activity. In the engineering shops, complete sets of ships' machinery are constructed, as well as pumping plant, land and marine steam boilers, steam road tractors, winches, and other sorts of mechan-

20. Details checked by Manager, Mr. W. E. Clegg.

21. One vehicular and two passenger ferries for the Sydney Ferries Limited.

ism. The construction of rolling stock is also becoming a feature of the Dockyard activities. Tramcars, bogies, loco. tenders, and all-steel carriages for railway and tramway use have been made, and are expected to be part of the regular output of the Island. Structural steel fabrication includes the making of foot, road and railway<sup>22</sup> bridges, cranes, roof trusses, steel frame buildings, etc. The Island, which receives large quantities of raw material from the B.H.P., has reciprocated with structural work, including a blast furnace and open hearth extension, on the Steel Works' plant. Finally, the Island has devoted itself successfully to the construction of steel pipe lines and cast-iron pipes. The pipes, which are now made with the aid of an electric welding machine, invented by members of the staff, are sold largely to water and sewerage bodies in the various States; the Island was, for instance, entrusted by the Hunter River District Water and Sewerage Board with the manufacture of 40 miles of pipes required for its Chichester water supply scheme.<sup>23</sup>

The war-time glory of Walsh Island as a big ship-building yard has suffered a decline. In 1918 the Island rang with the busy work of 2,500 men; to-day the labor force is about 1,300. It is at present to be regarded as the first engineering-construction shop of the district. The next largest structural engineering works are those of Messrs. A. Goninan and Coy., at Wickham and Broadmeadow, where between 300 and 350 men are normally employed in the manufacture of boilers, trucks and skips for collieries, as well as general engineering work. Another important firm is Messrs. Morison and Bearby, of Carrington.

#### SULPHUR, SUPERPHOSPHATES, CEMENT.

Closely related—by its past rather than its present activities—to the iron and steel group is the Sulphide Corporation Ltd., of Cockle Creek, a public joint-stock company operated from England, with a capital of £1,050,000. Here we find an excellent illustration of the adaptiveness of enterprise, and the adaptability of equip-

<sup>22</sup> Most of those, e.g., on the North Coast Railway Line. The Katherine River Bridge, Northern Territory, was recently completed for the Commonwealth Government Railways, both cylinders and superstructure having been made at Walsh Island. <sup>23</sup> The work for the Chichester scheme has been followed by large contracts for other steel pipe lines, e.g., Sydney Water Board's third section of the 79in. main, the 66in. main for the Water Conservation and Irrigation Commission, 3 miles of a 12in. main for the Metropolitan Board of Works, the 84in. main for the Barrenjack Hydro-electric Scheme, and many smaller lines of various sizes.—Interview with Mr. T. H. Tennant, Secretary.



ment to successive variations in the sorts and quantities of raw materials, leading eventually to a type of product utterly different from that for which the business was originally begun.

Twenty-seven years ago the plant was set up for the electrolytic treatment of zinc ores from mines at Broken Hill. Not proving commercially successful, the process was discontinued in favour solely of the smelting of lead ores brought not only from the Corporation's own Central Mine at Broken Hill, but also from other parts of N.S.W. and other States. This type of smelting was maintained until 1923. Then, finding it no longer profitable to ship and smelt the low tonnages coming from the Central Mine, as a result of a large reduction of working hours ordered by the State Industrial Arbitration Court, and unable to make up the required amount of 1,500 tons weekly from the declining output of other N.S.W. and Tasmanian mines, the Corporation closed down its Cockle Creek smelteries. An effort was made to work on smaller tonnages by re-modelling several furnaces, but without success. An arrangement was made for a Port Pirie company (one of the Associated Smelters) to handle the Corporation's Broken Hill ores—and no more came to Cockle Creek. The Corporation had been treating upwards of 200,000 tons of various materials annually, getting from this tonnage about 30,000 oz. of gold, 2,500,000 oz. of silver, and 28,000 tons of lead, and 320 tons of antimonial lead. From the roasting of the ores, about 19,000 tons of sulphuric acid (chamber acid) were recovered (some of this being used upon nitrate of soda to produce an intermediary agent—nitric acid), to be converted, in conjunction with phosphoric rock imported from the Pacific Islands, into from 25,000 to 30,000 tons of superphosphates. The superphosphates and another 800 tons of sulphate of ammonia (mostly exported) were sold for agricultural purposes. From the Corporation's distillation plant (for Mond gas-producer tar), as much as 50,000 gallons of heavy oils were produced for use in the refinery.

Following on the closing of the smelteries, arrangements were made with the Electrolytic Zinc Coy. of Australia to have their zinc concentrates sent from Tasmania, roasted at Cockle Creek, and then shipped back to Tasmania for electrolytic treatment; the Corporation paying the company for the sulphur extracted from the roaster gas. In 1924-1925, 22,500 tons of concentrates were thus treated, giving 4,500 tons of sulphur for the making, with the help

of imported quantities, 29,000 tons of superphosphates, and 16,000 tons of 100 per cent. sulphuric acid. Portion of the acid is used in the "pickling" and sulphate of ammonia plants of the iron and steel group.<sup>24</sup>

These activities by no means adequately employ the large plant. Big scale manufacturing enterprises almost invariably involve the localising in a single centre of a varied equipment, which can be made serviceable for different types of production. Thus it is at Cockle Creek. The lay-out of the plant—grounds, rail tracks, locomotives, sidings, water supply, workshops—and the presence of a trained staff have suggested adaptation to other uses, such as alkali and cement making. During 1924 the works were therefore modified for the latter manufacture. With substituted machinery, the equipment has lent itself admirably to this end. External conditions are also favourable to the success of the new manufacture; the right kind of clay is quarryable on the Corporation's own property; limestone can be brought profitably some 200 miles from Attunga; a colliery, with suitable coal, lies but a few hundred yards from the works; and there is the advantage over rival companies of the proximity of the whole northern markets of N.S.W. The Corporation's first instalment was a 600 tons-per-week unit, capable of an output of 30,000 tons annually, and which, between April and December, 1925, actually produced about 10,000 tons. The instalment of another similar unit in 1926 should double this output.

#### OTHER MANUFACTURES.

We shall conclude the more purely descriptive section of our analysis of manufactural industry by brief reference to some enterprises entirely outside the iron and steel group. Silica firebrick works at Waratah and Thornton may be counted among the latter's nearer relations. Clay bricks do not stream into the iron and steel manufactories as raw materials in the sense in which that is true of constantly renewed furnace bricks. At Young Wallsend building bricks are made by the plastic sand-stock method. Clay bricks, tiles and pipes are baked at a number of centres throughout the Valley—at Mayfield, Wallsend, Merewether, Cockle Creek, Fassifern, Thornton, East Maitland<sup>25</sup>—mostly on the sites of the clay

24. Interview with Manager, Mr. H. A. Evans.

25. The normal annual output of Dean's Ltd. (Mayfield) is 4,500,000 building bricks, as well as quantities of clay pipes; of Hughes' Works (Merewether), about 196,000 pipes of various sizes and sorts. Turton's Ltd. (East Maitland) supply the district with roofing tiles

pits. The large plant at Thornton, working valuable deposits of fire clay, produces both silica firebricks and clay building bricks, with modern machinery and kilns capable of turning out 150,000 a week.<sup>26</sup>

Another of the industries on the border-line between the extractive and the manufactural is that of gravel quarrying. At Teralba and Fassifern, about 12 miles from Newcastle, on the Sydney line, three companies are quarrying beds of conglomerate unhardened by pressure, which serves as a gravel much sought by municipalities and private purchasers. Yet another industry of the same class is blue-metal quarrying at Martin's Creek, on the North Coast line, one of the enterprises being conducted up till 1924 by the State Government, but now acquired by the Municipalities of Newcastle, Hamilton, Merewether, Adamstown, Wickham and Carrington. These six local governing bodies have united thus to draw their road-surface requirements economically from a local source. The quarries between 1920 and 1923 produced an average annual supply of 51,000 tons of metal well suited by its setting and wearing qualities for heavy traffic.

Mention has already been made of commercial coke production. Shipment quality is made by the Purified Coal and Coke Coy. to the amount of 18,000 tons yearly, and household quality by the Newcastle Gas and Coke Coy. (13,879 tons in 1923-1924), and by several private and municipal works in the smaller towns of the Valley. The Cotton Ginnery at Waratah, as also already mentioned, is an expensive equipment as yet receiving an altogether inadequate use, with cotton-growing in the State in merely an experimental stage. The ginning process is not complex—being the method of cleaning the cotton of its seeds by means of rolling hook-toothed discs and an air blast.

Apart from the presses for the daily newspapers in Newcastle and West Maitland, and for the bi-weeklies and weeklies of the smaller centres, there are scattered throughout the Valley some twenty large and small printing and book-binding plants—half of them in Newcastle and its suburbs. Other than the district abattoirs, to which we shall have occasion to refer elsewhere, and the

<sup>26</sup> The output of bricks of the Thornton Fire and Building Brick Co. Ltd. for 1925 exceeded 3,300,000, principally (75 per cent.) fire-bricks supplied to industry. The company also makes between 20 and 30 different classes and sizes of high-grade fire materials—bakers' fire-retorts, etc. An average of 300 tons of ore clay is sent in bulk form each month to the B.H.P.

dairy factories, to which we have referred in an earlier chapter, the remaining manufactural enterprises are of the miscellaneous type<sup>26a</sup> usually found in most large centres of mixed population — flour-mills, soap-works, clothing, food and furniture factories, etc.—and, although we may justly minimise neither their technical interest nor their economic significance, we may conveniently conclude this section with their bare mention.

### THE PROBLEMS OF MANUFACTURAL INDUSTRY.

What are the broad problems of manufactural industry in the Hunter Valley? It must be clear that each type of manufacture, as well as each separate undertaking, has its own peculiar technical and business difficulties—from the steel-tyre maker, with his problems of critical temperature, to the dairy factory manager, facing the disturbing alternations in the prices of butter and cheese. We are here concerned, however, rather with the problems which beset the manufactural industry of the Valley as a whole.

Uncertainty of assured supplies of raw material—the Damoclean sword which overshadows some industrial regions<sup>27</sup>—is never likely to become a serious menace to the district. It is true that reduced supplies have been responsible for the cessation of smelting at Cockle Creek; but that occurred not because ores had permanently diminished at their source, but because business wisdom dictated a more economic arrangement for the smelting in South Australia of the shortened output and the turning of the Cockle Creek equipment to more profitable uses. The largest consumer of raw materials — the B.H.P.—does not fear any lack of supplies, but, in order to be independent in the control of its coal supplies, has recently formed a subsidiary company—the B.H.P. Collieries Propy. Ltd.—for the acquisition and working of coal-lands on the Newcastle and Maitland fields. This is a move in the direction of expected cheaper costs of power. And it may be noted that industrial consumers who buy electric power complain of its costliness as a hindrance to its more extended use.<sup>28</sup>

26a. E.g., C. S. McIntyre Ltd. (flour mills), Kitchen and Sons Ltd. (soap and candle works), Wm. Arnott (biscuit factory), etc.

27. E.g., Lancashire, in its dependence upon overseas raw cotton supplies. 28. "The greatest drawback to the successful operation of the electric furnace in Australia is the present high cost of electric current."—Mr. W. E. Clegg, Manager of the Vickers-Commonwealth Steel Products Ltd., in his paper read before the Bureau of Steel Manufacturers of Australia, 10.4.24.

The big problems of manufactural industry are of a different order. They are (1) the problem of industrial fluctuation, (2) the problem of competition, and (3) the problem of labor.

#### A.—THE PROBLEM OF INDUSTRIAL FLUCTUATION.

Industrial fluctuation has been defined as "the alleged alternate occurrence of periods of industrial expansion and of industrial depression."<sup>29</sup> Precise estimates of the return of the cycle are still beyond the powers of the most observant economist or business man, but the *fact* of inevitable recurrence of fat and lean years is too well attested by experience to be called in question. The characterising feature of industrial cycles is, of course, the wide ambit of their effects. Not one industry, but all industries together, not usually one country but the round world, experience within a measurable period either general prosperity or general depression. And economists and the more analytically-minded men of business recognise that of the two—the peak of busiest activity and the point of utmost stagnation — booming prosperity, because illusory, is symptomatic of the more serious condition of social ill-health.

The specific phenomena by which business men measure depression are declensions in the aggregate net receipts to all in a trade or industry, in the margins or profits<sup>30</sup> per unit of the product, in the aggregate profits, and in the ratio of profits to invested capital—all of which are embraced in the phenomenon of falling prices.<sup>31</sup> The lowering of prices is only a device for inducing the absorption of the surplus stocks built up with ill-judgment during the upward tide of prosperity—and, if the fall goes far enough, inevitably means that labor is faced with the gloomy alternative of lowered wages or widespread unemployment. Thus business difficulties become social problems. To the student of economics it has become a commonplace that the "curves" of business health are reflected by a series of corresponding "social curves"—that with the rise and fall of prices, the rate of interest, export and import trade, and regis-

<sup>29</sup> D. H. Robertson, "A Study of Industrial Fluctuation," p. 2.

<sup>30</sup> In margins by Selling Price of product at date of sale being less than S.P. of raw materials at date of sale of products; in profits by S.P. of product at date of sale being less than S.P. of raw materials at date of manufacture. (Robertson, *ibid*). <sup>31</sup> This generalisation is a guarded one; a lowering of price not always meaning depression, nor a rise indicating that trade is active.

tration of new enterprises, there are similar movements in employment, the rates of marriages and births, consumption of luxuries, criminal convictions, etc. Because of its special mid-position as a socio-economic phenomenon, we may agree with Sir Wm. Beveridge<sup>32</sup> and other economists in regarding the extent of unemployment, relative to a norm, as the most useful criterion of industrial fluctuation.

To what extent has manufacturing industry on the Hunter been subject to movements of the general industrial level of recent years? When measured by changes in representative unemployment figures, there is revealed the interesting fact (known in all practical business circles) that the "time lag" between the more noticeable changes in the levels in Great Britain and the United States and their effects in Australia ranges from a few weeks to about one year. Thus, in both Britain and America the break in the soaring war and after-war prices turned to precipitate descent in the last months of 1919 and the first months of 1920, reaching its lowest level during 1921 and 1922. After this, there was a tendency in the U.S.A. to rapid, and in the U.K. to much slower recovery, checked, before it reached the intensity of a boom, by the deliberate contraction of credit by the Federal Reserve Board in 1923, and the Bank of England in 1924. This really is in accord with the tendency for the period cycle, which before 1900 normally extended over a period of about ten years, to show a remarkable shortening of its oscillations. American experience of price changes of commodities and money supports the conclusion that for 25 years before the War business depressions occurred at intervals of from three to four years. The special contribution of the central banks of America and Britain has been to help prevent crises by anticipatory flattening of the threatening peak of boom.

In Australia the after-war tumbling of prices of most commodities began in September of 1920—four months later than in the U.K. and U.S.A. Unemployment became marked in the first quarter of 1921, and developed

32. "Unemployment," p. 51. See also J. R. Bellerby's report on "Control of Credit," pp. 72, 73, 89, 90, and article on Bank "Credit and Unemployment," in *International Labour Review*, Jan., 1924. Bellerby shows that the employment index is the most reliable guide in determining when bank credit should be restricted, viz., at the point when, with a very high proportion of the working force of industry already occupied, bank credit is sought by somebody "to take work or orders away from somebody else." W. A. Beveridge makes a similar claim for the employment index in his "Cycles of Unemployment in the United States, 1903-1922," pp. 4 and 5.

with increasing intensity, especially in the engineering and metal works trades, to the last half of 1922, and with fluctuating but diminishing intensity since. Since our chief interest in manufacture is the iron and steel industry, it is appropriate to illustrate this movement from the unemployment figures of the largest union in the iron trades—the Amalgamated Engineering Union. The total membership for the Commonwealth gradually increased from 14,858 in January, 1919, to 19,747 in February, 1922—a measure of the growth of engineering industry. The average number of members unemployed each month during 1919 was 295, the figures being reduced, although total membership was growing, during the boom months of 1920, but speedily increased during the growing depression of 1921 and 1922. During 1922, the average reached 980, over 1,000 being unemployed in each of the first six months. Thereafter, gradual improvement set in until the old 1919 level was reached during 1924.<sup>33</sup>

#### UNEMPLOYMENT IN NEWCASTLE INDUSTRIES.

The fluctuations in the same trade in the Hunter River District show a similar curve. The mean number of members of the District Branch of the A.E.U., and the monthly total of unemployed from July, 1917, to October, 1926, were as follows,<sup>34</sup> showing that the industrial depression was at its intensest during 1922:—

##### *Mean Number of Members in Newcastle District.*

	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Jan.		748	785	921	921	961	1113	1025	1008	—	1162
Feb.		757	793	908	908	964	1127	929	1100	1085	1166
Mar.		759	799	948	948	977	1134	910	1100	1089	1171
Apr.		768	792	932	932	981	1112	1014	1053	1100	1192
May		771	799	934	934	967	1104	990	1026	1112	1186
June		691	776	827	939	978	1093	987	1042	1115	1182
July	696	777	820	954	954	1005	1086	989	1040	1119	1180
Aug.	702	782	840	958	958	1059	1088	990	1040	1126	1181
Sept.	762	793	871	974	974	1075	1077	981	1048	1127	1180
Oct.	758	793	903	983	983	1082	1044	982	1060	1123	1187
Nov.	762	782	903	937	1067	1092	1058	1009	1073	1122	
Dec.	765	790	924	953	953	1109	1053	1012	1065	—	

<sup>33</sup>. From figures supplied by Mr. A. S. Evernden, President, Commonwealth Council, A.E.U. <sup>34</sup>. Specially compiled for the writer by Mr. T. B. Ward, Organising Secretary, and his assistant, Miss E. Bell, from monthly returns in the Branch Office, Newcastle.

## LIVELIHOOD FROM MANUFACTURE 105

### *Monthly Total of Unemployed Members in District.*

	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Jan.		16	0	3	3	3	201	105	29	18	9
Feb.		4	0	2	2	10	196	42	18	19	16
Mar.		4	0	5	5	24	183	37	14	21	5
Apr.		6	0	2	0	27	142	39	24	19	4
May		3	1	1	1	27	113	19	13	20	228
June		5	3	0	2	31	138	30	8	12	185
July	4	1	0	1	1	7	158	11	21	10	127
Aug.	6	no report	1	4	4	9	172	22	16	12	109
Sept.	340	0	1	7	7	14	190	18	15	8	91
Oct.	326	1	1	1	1	10	230	25	3	1	85
Nov.	56	3	2	0	0	25	200	17	6	0	
Dec.	33	0	1	3	3	23	200	16	28	5	

It will be seen that from July, 1916, to January, 1921—the period of rising “prosperity”—there was, except for a few months’ disturbance on account of a dispute in September, 1916, no appreciable difference in the actual average number of men signing the out-of-work register at the Union office. Yet during those 4½ years total membership had grown from 696 to over 1,000—an increase of about 50%. The wash of the cyclic unemployment wave began to affect Newcastle engineers in February, 1921, but the wave itself did not become overwhelming until January, 1922. Then came the inevitable descent from the peak of the artificially prolonged boom in the steel industry, and during the whole of 1922 never less than a hundred engineers, and, for nine months, more nearly twice that number, registered themselves daily as unemployed. The total membership had continued to swell to a total of 1,134 by March, 1922, thereafter, as man after man disappointedly left the district, slowly dwindling, until industry once more began to show normality about November, 1923. The next disturbance of normal conditions—in May and June, 1926—was due to the Union’s dispute with the B.H.P. over the interpretation of the clause in the Federal award dealing with hours of duty before operation of over-time rates, in industries in which the recognised hours for the general body of employees is 44; but the inflation of unemployed figures on this account has no relation to the earlier swollen numbers, due to the general industrial cycle.

A still more valuable index of industrial fluctuation in the district will be found in the variations of the aggregate labor force of six of the largest employing concerns



(exclusive of collieries) in Newcastle, namely, the Steel Works, Walsh Island, Rylands Bros., A. Goninan and Coy., Commonwealth Steel Products Coy., and the Sulphide Corporation. These alternations are shown in the lower of the two accompanying graphs, the upper of the two representing the published unemployed percentages of British Trade Union membership from January, 1920, to the end of April, 1926. The lower graph is based upon records in the N.S.W. Dept. of Labor and Industry over a slightly longer period.

Comparison of the two curves at once reveals the fact of a twelve months' "time lag" between the precipitate break in British boom conditions at the end of 1920 and the corresponding plunge downwards in Newcastle at the end of 1921.<sup>35</sup> Under the stimulus of an unsatisfied general demand, combined with the sudden cutting off of huge governmental war orders, British industrial production swiftly overtook the shortage which raised prices to their pinnacle by the middle of 1920. The first half of 1920, in England, was a period of intense manufacturing and business activity, with unemployment much under normal. It will be remembered that the same feverish activity continued in Australia right through 1921. The hungry demands for iron and steel goods created by the swelling army of enterprisers on the Australian market made 1921 a culminating year of high prices, high wages, and plenty of work for Newcastle workers at the very time when, on the markets of the world, prices, wages and work were already leap-frogging downwards.

As the cheapening European (and American) iron and steel began to invade the Australian market, and to menace the supremacy of the local products, it was inevitable sooner or later that our metallurgical companies should resort to measures of defence. Thus the B.H.P., in the absence of sufficient elasticity in the tariff and award wage levels, led the way first by some shortening of its labor force (the *casus agendi* being an award to the Engineers by Judge Higgins), then by attempts to get relief from the unaltered high price of coal, and finally by the closing down of the steel works, with the dismissal of all

<sup>35</sup> The "time lag" applies not only to prices of locally made iron and steel goods, but to imported general merchandise, as seen in the following retail index prices (base year 1913 = 100) of a large Newcastle retail drapery store:—

1918	1919	1920	1921	1922	1923	1924	1925	1926
168	194	259	295	254	232	233	233	234

The percentage of unemployment in British trade unions increased from 3.7 to 6.1 from Nov. to Dec., 1920, i.e., from below to above normal.

but a cadre staff; wholesale dismissals soon followed in other branches of the iron and steel group, and the Newcastle district fell swiftly into a period of acute depression.

What actually happened in the case of the B.H.P. may be illustrated from the fortunes of the Engineers. By a State Court determination, no person receiving £4 a week was allowed to benefit by any cost-of-living-increase awards made by the Court. This was of advantage to workers on the basic wage, but worked adversely against the Engineers who, since 1907, had been allowed a margin of 3/- a day (10/- as against 7/-) for skill. On 14th June, 1921, the Engineers secured from Judge Higgins a Federal award granting them an increase, proportionate to the 1907 margin, of 10/- a day. The delivery of the award was followed immediately by the dismissal of men by the B.H.P. and other enterprises, followed by their application, first to the State Court and later to the Federal, for relief from what they claimed to be oppressive conditions; despite the acknowledged losses in real wages which the Engineers had suffered since the beginning of the war.

In the hearing before Judge Rolin, of the State Court, the B.H.P. Coy. stated<sup>36</sup> that with the existing conditions (basic wage at £3/18/- per week of 48 hours, with differential rates for shift work), the comparative prices of Newcastle and imported steel, including freights, etc., landed in Melbourne, were as follows:—

	Newcastle.	Imported.
Foundry Pig Iron .. . . .	£8 3 4	£7 7 4 per ton
Heavy Rails .. . . .	14 15 2	10 19 9 "
Merchant Bars .. . . .	18 5 7	13 12 6 "

It was suggested that if the working week and basic wage were retained at the same level, with no margin for shift work, a reduced margin made for skilled labor, and a reduction granted in the price of coal, etc., the comparative prices in Melbourne could then be made as follows:—

	Newcastle.	Imported.
Foundry Pig Iron .. . . .	£7 7 3	£7 7 4 per ton
Heavy Rails .. . . .	13 12 9	10 19 9 "
Merchant Bars .. . . .	16 15 10	13 12 6 "

This would still leave imported rails and merchant bars, despite the Customs duty included in their prices, victors in the open market. The B.H.P. could only continue to

36. "Newcastle Morning Herald," 16.9.22.

produce for a time with guaranteed orders from sympathetic Governments willing to forego the advantage of cheap purchase.

In November, 1922, the Judge gave a measure of relief (which provided in effect that the Company could, in a number of cases, pay less than the State living wage),<sup>37</sup> but a month later, on the appeal to the Full State Arbitration Court by the main union involved (the Australian Workers' Union, Industrial Union of Employees), it was annulled.<sup>38</sup> The Company by this time had had its works closed down about a year. In January, 1923, a new order, the result of an agreement entered into between the Company and the A.W.U., a Conciliation Committee having been formed, with the consent of the Ironworkers', Moulders', Painters' and Plumbers' Unions, was made by Judge Curlewis. This retained the wage rates of Judge Rolin's rejected decision *as a whole*, but provided that the Company should make up from its first profits six months later the wages of any employee whose wage rate had suffered reduction from that fixed by the award originally prevailing. The works were immediately reopened, and, the new arrangements promising to make operations continuous and subsequently profitable, the Company paid up the required differences in the following July. In that month a new agreement, of improved rates all round, was turned into an award by Judge Edmunds, and has since been operative.<sup>39</sup> These conditions could not be made to apply to crafts working under Commonwealth Court awards. The Engineers, for instance, fared rather badly at the hands of Judge Powers of that Court, who reduced their weekly wage by 25/-, a position from which their latest appeal (1924) has not been able to rescue them.

The employment for the six representative firms of our illustration has, since January, 1923, been showing a steady incline upwards; but the still precarious position of local industry in competition with that of overseas was shown by the sudden dismissal, in November, 1924, of several hundreds of men, mostly employees of Rylands' wire-netting and nail-works.

37. N.S.W. Industrial Gazette, Nov., 1922. 38. Ind. Gaz., Dec., 1922. 39. Ind. Gaz., July, 1923. To be in force for two years. Four sectional variations were made later. Upon the expiry of the award in July, 1925, A.W.U. members and the Ironworkers' Union combined for the purpose of filing joint claims before the Court, thus actually repudiating the existing machinery of the Conciliation Committee. The Court in Dec., 1926, made a new improved award binding for another three years.

## COUNTERING CYCLICAL FLUCTUATION.

It is quite obvious to the student of world economic conditions that the deflation of wages was sooner or later inevitable, and that the B.H.P., by closing down when it did, followed the course most clearly dictated by the interest of its shareholders. The conviction is still strong among the industrial workers generally, however, that the assets which had been built up during the feverishly busy years of the war might well have been in large part spread over the depression period as wages, and that the wholesale dismissal of the working force was but part of a conspiracy to force the hands of the Courts to order unjust wage reductions. Newcastle certainly staggered beneath the loss of a weekly wages payment of round about £30,000, and, amongst workers' families handicapped by improvidence or unmerited misfortune, distress in many cases was exceedingly acute.<sup>40</sup>

The prevention of these disastrous alternations of agreeable activity and distressing stagnation is quite evidently beyond a local achievement. The peristaltic motion of the wave started in England will sooner or later be felt by people in the Hunter Valley. What can be done to enable the wave to find its level, or, at least, to prevent its growth to menacing proportions? The most hopeful promise seems to lie in increasing the power of dispassionately-administered central banks in all countries, including the Commonwealth, *to check trade prosperity when on the up-grade*. This might be done effectively by the deliberate and early raising of the cost of money—within the capability of central banking institutions, such as the Bank of England—thus contracting all forms of credit.<sup>41</sup> "It would need," of course, "great confidence on the part of the business world and of work-people to entrust anybody with so unpopular a task."<sup>42</sup>

40. Union, municipal and private relief organisations were busy in city and suburbs throughout 1922.

41. The problem is one of regulating the rate of expansion of industry, the rate at which the surplus of purchasing power normally saved from present consumption needs shall be applied to extend existing businesses or to launch new ones. "The ideal to be aimed at as regards credit," says Prof. Pigou, "is the contraction of credit as soon as the stocks of finished articles unmarketed show signs of increasing, and to begin to expand it as soon as they show signs of diminishing." ("Unemployment," World of To-day Series). In U.S.A., U.K., Sweden, Norway, Denmark and Belgium the fall of prices in 1921 and 1922 was only checked after credit had been eased by the lowering of the bank rate. Just as in those countries, and in Japan, France and Italy the brake was applied to the boom prices of late 1919 and early 1920 by an abnormal rise in the bank rate (I.L.O. Report No. 8, series C, pp. 149-150). 42. Statement of nine English economists in their analysis of the current unemployment problem, published under the title, "Is Unemployment Inevitable?" 1924.

To the patient with rising temperature febrifuge medicine is often disagreeable, and seemingly unnecessary.

Yet it would probably be requiring too much of the human nature of business men to expect managements voluntarily to restrict their own activities when business is more than usually brisk, and to undertake extensions when depression is already heavily upon trade. It would be much more reasonable to look for their co-operation in resisting the movements of the cycle by counting on their self-interest. If some Australian central institution (comparable to the Federal Reserve System in the U.S.A., or to the Bank of England) were able to announce when business is at a certain point on the up-grade that *no boom would take place*, because credit was to be restricted sufficiently early; or that at a certain point on the down-grade *no depression would come*, because credit was to be expanded, large Government purchases for future needs begun, and public works immediately undertaken; if such signs were hung upon the heavens of the business world, as is already being done with increasing success in America, private enterprise would in large measure *automatically* co-operate to prevent these fluctuations.<sup>43</sup>

It must, however, be obvious that an Australian central banking institution's influence could only be effective to the degree that its credit policy and its decisions synchronised with those of Britain and America. The extreme variations in the volume of our primary production are, it is true, an outstanding factor accentuating cyclical prosperity or depression, but they are not, even in Australia, the prime cause of the business cycle; a fact suggested by the relative stability of the volume of our secondary production.<sup>44</sup>

Meanwhile, until experience teach how best to control, over wide areas, the existing "octopoidal" industrial order in the social interest, there can only be, within the narrower limits of the individual enterprise, intelligent fore-thinking and adaptation. It will not serve the general interest or increase the volume of employment, for instance, in times of depression if the pushing of sales by one business merely results in capturing from a rival part of the already restricted market. Any stimulus to the consumers to greater *total* spending, whether by ad-

43. J. R. Bellerby, in his lately published "Stabilisation of Employment in the United States" (1926), suggests practical ways in which this might be achieved. 44. See Sutcliffe: "The National Dividend of Australia" (1926), p. 18, and graph p. 19.

vertising or other form of solicitation, on the other hand, is clearly of social value. In times of busy turn-over and abundant gains, it is equally clearly not in the general interest that more than a certain part of the increased returns should be translated into buildings, machinery, stock and other forms of fixed and circulating capital. Employers during this time might wisely ear-mark reserves to be deliberately forfeited in part maintenance of their labor force in the period of slump,<sup>45</sup> the employees' organisations, on their part, accepting some deflation of nominal wages as inevitable and desirable.<sup>45a</sup> There could thus be achieved a more equitable sharing of the general adversity, as already there had been, with high profits and high wages, of the general prosperity. If there is to be produced such foresight, adaptation and defiance of the cry of "sauve qui peut," a new *morale* will need sedulously to be engendered in the conservative strongholds, both of opinion and practice, of employer and employee.

### THE PROBLEM OF COMPETITION.

Our discussion of the effects of industrial fluctuation has inevitably opened with the question of local manufacture in competition with that of overseas. The problem of the cycle is indeed, as far as it affects the Hunter River manufacturers, only their normal problem of competition accentuated.

For an all-round manufacturing industry, the Hunter River Valley possesses most of the raw material requisites of production, besides adequate labor and a growing population to serve, and, filial dependence upon the older world for patented machinery notwithstanding, refuses

45. An idea as old, at least, as Sismondi (1773-1842), the first critic of the "laissez faire" economists. National insurance is a recognition of this part-responsibility of employers to prepare for the inevitable unemployment period. "Your Commissioners," says the second Progress Report of the Royal Commission on National Insurance (1926), "recommend that a system of insurance against unemployment be instituted to meet those risks which are found to be unavoidable, and where assistance to necessitous cases is warranted." (p. 23). 45a. What is suggested is a controlled "plasticity"—with the twofold social aim of—(a) preventing wage changes as violent as commodity price variations; and (b) averting the unemployment which arises from rigid insistence on no downward wage changes. Organised labor should be intelligently adaptable to the (as yet) inescapable cyclical rhythm of industry. The suggested "plasticity" is thus to be identified with variations neither in the cost of living nor in productivity per head of population—which open up a current though different question. It is to be regarded rather as an immediately responsive, though temporary, relaxing of nominal rates with the object of ultimately maintaining real wages at Arbitration Court standards without the discounting due to widespread unemployment.

to play the part solely of primary producer in the Free Trade theorist's "territorial division of labor." We may then assume that the fostering of manufactures in the Valley is justifiable and desirable.

But if this be so, it is clear that some degree of protection should be given in the difficult first stages of local enterprise, to offset the various advantages secured to long-established manufactures overseas. British and American manufacturers have, for instance, two markets—home and export—each serving to cancel out the variations of the other, and together thus maintaining momentum and regularity of production. They depend for this continuity of operation largely upon the export markets, where surpluses can be "dumped," without endangering the home enterprise, at prices below cost. Australian producers, because of geographical position, relatively higher labor costs, and the Federal Government's attitude that manufacturers in Australia must not sell abroad at lower prices than those obtaining in their own country, cannot enjoy the advantages of a double market.

In common with other manufacturers of the State, however, Hunter River producers work under a measure of protection in three forms—(1) through Federal tariffs, (2) through Federal bounties, (3) through concession freight rates on the State railways.

#### PROTECTIVE DUTIES AND BOUNTIES.

While acknowledging that successive Governments have acted sympathetically towards them, some local manufacturers aver that the protection they receive is still too little. The inability of Walsh Island, for instance, to secure orders for the building of big ships lies largely in the fact that while there are considerable duties on imported ship-building materials, all ships of over 500 tons gross built abroad are admitted free.

The sentiment of a preferential 10 % tariff reduction in favour of British as against foreign goods finds ready enough support, but vigorous were the protests prior to 1925 against the provision that this preference could be applicable to commodities only 25 % of whose value need have been added in Britain. It worked out that British manufacturers used cheaply-made materials from the Continent or elsewhere, applied to them a certain amount of British labor, and then exported them to Australia. This obvious abuse of the preference provision resulted

in the Federal authorities raising the British-made requirement to 75 %—operative from March, 1925.<sup>46</sup>

Moreover, the Tariff Board recently discovered that English exporters were selling in Australia wire-netting about 30 % cheaper than the English market price. The home consumption price of English standard heavy wire-netting, for instance, was about the middle of 1924 £75 per mile, and the landed price in Australia (c.i.f.e.) £46, while the price of Rylands' product was £53. After careful investigation, the Tariff Board was able to confirm the complaint by Rylands Ltd., that wire-netting was being sold cheaper in England for export than for home consumption.<sup>47</sup> English manufacturers operate, as far as the English domestic trade is concerned, under a strict price agreement, with heavy penalties for any breach, as "The Wire Netting Manufacturers' Association." "The price charged by the Australian makers of netting," reported the Board, "is a reasonable price. Bounty is only paid on that condition, and the percentage of profit is limited by the Bounties Act not to exceed 15 % on the capital invested. The departmental officers check the manufacturers' books before bounty is paid."

In view of all the circumstances, the Board, in exercise of its function under the Industries Preservation Act, reported (a) that wire-netting of British origin was being "dumped" into Australia, and (b) that detriment was thereby resulting to an Australian industry. It therefore recommended that the amount of dumping duty in each case should be the difference between the f.o.b. price charged for export and the fair market value of the netting for home consumption at the port of shipment, even when invoiced to Australia on a c.i.f. basis. No dumping duty was to be charged, however, when the landed cost of the netting was *not less* than the selling price in Australia of Australian netting, even though the price for export were less than the fair market value in England.<sup>48</sup>

Prior to the introduction of the bounty system there was a duty on English netting of £3/8/- per ton. This was removed, and a bounty paid on Australian netting actually sold of £3/8/- per ton, as a result of the objec-

46. New Zealand adopted similar regulations in Nov., 1925, to come into force April 1st, 1926. They require, however, only 50 per cent. of British material or labour to be embodied in articles receiving preferential treatment. 47. Ordinarily the English manufacturers would allow a 70 per cent. discount on listed prices to the overseas buyer as against 65 per cent. to the English buyer. 48. Tariff Board Annual Report ("C"), June, 1924.



tions to the tariff from the Country Party. The effect of this has been, of course, to transfer the cost of the protection given from the farmer to the public in general, leaving the local manufacturer of wire-netting unaffected.

On top of the bounty to the local maker, there is the advantage which accrues to him by the dumping duty paid on the imported article. As the Customs Department accepts the ruling price of the Australian commodity as reasonable, and arranges that such a duty shall be paid by the imported article that it must sell in the Commonwealth at the same price as the Australian, it means that both imported and locally-manufactured stand on exactly the same level, and that the Australian product must live by its merits.

We here have an interesting instance of the incidence of a protective duty. In economic theory it can be shown that when commodities continue to be imported for a considerable period after the imposition of a duty, the price in the duty-levying country will rise by the full amount of the duty. This is true when conditions in the country of origin are competitive. When, however, any effective degree of monopoly is achieved among manufacturers in the country of origin they will tend to have two prices for the same goods—a higher for their own market and a lower in external markets, including countries like Australia, which impose a duty. Obviously, the duty is imposed on only part of the output of such a monopolistic organisation as the British Wire Netting Manufacturers' Association. The landed price in Australia, for instance, of £46 per mile for English netting probably represented cost, insurance, freight, exchange (c.i.f.e.), plus something *less* than the full amount of the duty, in view of the certainty of making up the difference, under sufficiently strong monopoly conditions, on the English market. Until the Australian Tariff Board's adoption of its anti-dumping device, the Australian consumer of wire-netting was actually gaining at the expense of the English consumer—one of the rare instances in which the "outsider" or "foreigner" is really made to relieve the Australian consumer of the incidence of protective duties.<sup>49</sup>

A second effect of the anti-dumping arrangements is that fluctuations in general industrial conditions in Europe and America do not become reflected in similar

<sup>49</sup> As, e.g., in Taussig, "Some Aspects of the Tariff Question," Chapters I. to III.

movements in wire-netting prices in Australia. Thus there has been no downward tendency in such prices in 1925 in sympathy—allowing for the 12-months' "time lag"—with the second after-war industrial decline, beginning in Britain from the middle of 1924 (see graph above). The main factor causing fluctuations in the sale of Rylands' products is the variation in the seasons; when droughts occur there inevitably follows a shortening in demand; when the farmers' cheques are good, the orders for wire and similar equipment increase.

The disability, however, which the Australian manufacturer still suffers in the face of declining prices abroad—mainly of labor—however strongly he may be at one with the Australian worker in desiring to maintain a high standard of life in the Commonwealth, is notably illustrated in galvanised iron-making. When Messrs. John Lysaght started making their product at Newcastle in 1921, they were getting boom prices. But in that year, as we have seen, the "bottom fell out of the market" here, as it had already been doing twelve months earlier in Britain. To-day, the selling price is 30 % lower than when the work began. An English skilled fitter at that time was getting about £5/10/- a week, but his wages (and therefore English cost of producing galvanised iron) have since fallen to £3/10/-—a drop of 36 %. To-day, the Australian fitter gets about £5/10/-. In many cases the firm is called on to pay wages up to 100 % more than the British level. This serves to illustrate the problem of differential costs.<sup>50</sup>

Considerable insecurity is felt by Newcastle manufacturers, also, on account of the repeated interference with tariff duties. A certain tariff percentage will be fixed, and local manufacturers' plans be made to meet an increased demand—with the importation of new machinery, etc.—only to their confusion and loss following on an unexpected reduction favourable to the imported article.<sup>51</sup> This disadvantage, however, would seem to be the unavoidable price of a desirable elasticity of the tariff in a community, like the Commonwealth, of growing mixed interests.

The duty on British galvanised iron is £1 per ton,

50. Interviews with Manager, Mr. W. S. Whitmore. These facts were given as sworn evidence before the Royal Commission upon the Railways, 1924, and before the Tariff Board, 1925. 51. Mr. R. M. MacDougall, President of Newcastle Centre, N.S.W., Chamber of Manufacturers, in a speech reported in "Newcastle Herald," 1.9.24.

that on foreign £3.<sup>52</sup> Even with the added assistance to the Newcastle industry of a Federal bounty of £2/12/- per ton (which is approximately 11 % of the selling price), a reduction of about 30 % upon the rate charged for rail carriage of the imported article, another 20 % upon its own freight cost if exported beyond the State, and several other differential advantages upon the use of full trucks, the English products find Australia a good market. The Federal Government authorises bounty assistance to industries about Newcastle to the amount of £130,000 annually—the whole of which has not yet in any year been claimed.

#### RAILWAY FREIGHT-RATE CONCESSIONS.

It has been the practice of the Railway Commissioners of N.S.W. to give preferential freight rates in favour of local as against imported products for the past 35 years. The charge for iron and steel, for instance, for 100 miles, is £1/15/5 per ton for local and £2/9/7 for imported—an advantage to the former by about 30 % reduction upon the charge to the latter. It has thus been State policy to give encouragement to N.S.W. industries by what is equivalent either to a bounty or an addition to the Federal tariff.

The attacks made upon this system of preference by representatives of primary producers and British manufacturers before the 1924 Royal Commission on the Railways illuminate the conflict of interests involved. The President of the Stock Owners' Association of N.S.W.<sup>52</sup> described the rates as "an outrage against the primary producer . . . a piece of piracy by the Railway Commissioners, for which no excuse can be found." He pointed out how the man on the land is always in need of galvanised iron for woolsheds, cowsheds, and other buildings, but is penalised by what is really an unwarranted building up by the State of the Federal tariff wall. He found no less than 128 articles — horse shoes, piping, axles, tubes, tubs, buckets, nails, springs, tyres, etc. — to which these differential rates applied. Upon the 20/- per ton duty against British iron and £3 (then 30/-) per ton against foreign, the Commissioners, "constituting them-

<sup>52</sup> Raised from £1/10/- on the recommendation of the Tariff Board in its report of July, 1925. <sup>53</sup> Mr. C. Binnie. See his evidence on page 116 of the Royal Commissioners' Report. Objection was raised also by the Apple and Pear Growers' Association. Messrs. Jno. Lysaght Ltd. submitted a memorandum in reply, stating that it was only on the assumption that the preference would be continued that their works could have been established. In three years' working, £26,000 had already been lost.

selves a super-Government," impose a further penalty of upwards of 40% on the imported article. The "concession" to the local manufacturer becomes thus a "*load*" put on the primary producer"—how naively the word reveals an "unfavoured son" psychology, inevitable in a paternalism which permits differential treatment of those otherwise equal before the law!

And the viewpoint of the British manufacturer and of the indenter of his goods, of course, necessarily coincides with that of the man on the land. They claim, in the words of the President of the Sydney Section of the Australian Association of British Manufacturers and their Representatives,<sup>54</sup> that "the Railway Commissioners are not only going beyond what is necessary, but they are placing a hardship upon a man who is a very useful citizen, inasmuch as he is bringing forward the primary product which put the country on its feet primarily," especially as local manufacturing cannot meet the needs of the State.<sup>55</sup>

As against these claims the Newcastle manufacturer points to his disability in shipping freight rates. It costs Lysaght's Newcastle Works, for instance, a disproportionately big amount to deliver their product in, say, Fremantle, Adelaide, and Melbourne, in comparison to the cost to British firms. By boat the freight for galvanised iron from Newcastle to Fremantle is £2/2/6 per ton, to Adelaide £1/5/3, and to Melbourne £1/1/9, as against the £3/3/- per ton from England to all Australian ports, an exceedingly disproportionate advantage in favour of the British maker. In effect, it means that for iron sold in Fremantle the tariff protection is discounted by £2/2/6 per ton.

The Vickers-Commonwealth Steel Products Ltd. is even more heavily handicapped. The company must pay £2/7/6 per ton for the carriage of its products from Newcastle to Fremantle, whereas similar goods have been carried thither from Liverpool for £1/15/-. Regular and prompt shipment of English goods to Fremantle, combined with Western Australian prejudice against the Eastern States (chiefly on account of the operation of the

54. Mr. J. B. Rumford. See his evidence on page 133 of the Report.  
55. "There is," he stated, "so far as we can learn, a much greater proportion of galvanised iron imported than is locally manufactured. I do not think that at the present, and for perhaps a very long time to come, local manufacturers could meet the whole of the demand for the N.S.W. market." The actual figures for 1923-24 were:—Imported, 92,569 tons; locally-made, 15,550 tons, on which £40,499 was paid in bounty. See Tariff Board's Report on Galvanised Iron, Sept., 1925.

tariff), tend to make Western Australia a difficult market for Newcastle products.

In this connection it is instructive to observe how remote factors affect our industries. An economic force uncontrollable from Australia makes English outward rates relatively low. In the working out of competitive shipping rates on a route over which goods are carried both ways, a higher rate is charged against the direction for which the demand for shipping is greater. "This is, of course," says the English economist, Prof. Pigou, "the reason why outward freights from England are generally low, relatively to inward freights for commodities of similar value. Our imports being largely food and raw materials, and our exports, apart from coal, mainly finished manufactures, the former naturally make a greater demand for shipping accommodation. If it were not for our coal exports, the disparity would be much greater than it is."<sup>56</sup>

All things considered, probably a system of temporary bounties is the most equitable form which protection of industries like those of Newcastle should take.<sup>56a</sup> Tariff duties and preferential railway rates throw too much of the incidence of the cost of protection upon the farming section of the community—a section upon whose successful activities the whole Commonwealth is so specially dependant, and which must needs use very extensively commodities like galvanised iron and wiring, the latter so largely in the war against the common enemy—the rabbit. Subsidising by bounties in lieu of preferential railway rates and of extensions of the tariff as the price of fostering home industries need not necessarily mean a permanently greater cost to the people. And it certainly would have an added twofold advantage. It would be a bonus upon *actual* production. And it would be a safeguard against entrenched monopoly. Protection would no longer be a device entangled in the revenue-producing machinery of the tariff, nor become em-

56. "Economics of Welfare," p. 266.

56a. The total bounties paid for the financial year 1925-26 under the existing Iron and Steel Products Bounty Act were as follows:—

(i.) Wire Netting, tons 27,979 . . . . .	205,127
(ii.) Fencing Wire, tons 37,456 . . . . .	97,387
(iii.) Galvanised Sheets, tons 18,931 . . . . .	49,291
(iv.) Traction Engines, Number 3 . . . . .	270

2242,005

The amounts for wire netting and fencing wire were divided between Lysaght Bros. and Co. Ltd., Parramatta River, Sydney, and Rylands Bros. (Aust.) Ltd., Newcastle, and the whole of that for galvanised sheets went to Lysaght's Newcastle Works Ltd.

bedded in a conservatively maintained and fixed institution for which every Federal Government develops too great an affection as a money-raiser to let go easily.

### C.—THE PROBLEM OF LABOR.

There remains the problem of labor, the resurgent malaise which makes contemporary industrial life a long "fitful fever," never long quiescent, always a symptom of the troubled conscience of a society pre-occupied with unsatisfying values. Viewed thus, the problem is insoluble until men submit themselves to the transformative force of that mystical religious experience which "sublimates" self-seeking desires into a passion for serviceableness to others. Motives in industry have no common polarity, but stubbornly urge thought and action to a myriad individual ends. The tragedy of the industrial conflict lies not in the fact of the contrariety of the "economic pulls"<sup>57</sup> but in the perpetual self-justification, complacent or vociferous, of the several classes in the struggle — employers, investors, professionals, wage-takers, or whatever the groups into which men find themselves alike through a common economic interest.

Our task, however, is not to frame wide generalisations, but to consider some of the practical difficulties of correlation of the two main human factors in industry—Management (representing not only enterprise and investment, but the "personality," as the accountant understands the term, of the business itself)—and the Labor Force. The "problem of labor" within industry must thus be approached from two viewpoints—that of the administrator and that of the operative.

Management is essentially the task of assembling all the necessary factors of enterprise, maintaining their happy co-operation in the processes of producing, and disposing of the product sufficiently profitably to meet at least the minimum expectations of all concerned. Thus in its purely technical function, it must secure the factor "labor" adequate for the work in hand in quantity, variety and quality. To management, therefore, there is a problem of adequacy in relation to labor. But, for their part, the men who will make up the labor force, the bread-winners and home-builders of the mass of the people, have their problem of adequacy—of opportunities for livelihood-making, of wage-payment, of respite from excessive or monotonous toil, of interest in the task

<sup>57</sup> J. A. Hobson's phrase.

itself, of all, in short, that makes for satisfying self-expression. Such ends pursued by management and men are justified, for the attainment of the aims of each is the very condition of the well-being of the other.

#### THE MANAGEMENT'S VIEWPOINT.

In order to secure a working staff which can be depended upon to operate a plant with the maximum of efficiency, the management, especially in a growing concern, normally finds itself to be perpetually experimenting. For nearly all tasks in a work-shop new employees require a certain amount of "breaking in." During and after such preliminary training, that is, before they reach a fully productive stage, some men prove themselves unfitted for the requirements of the enterprise, and must be dismissed; others, disliking the work and hoping for better luck elsewhere, leave voluntarily. Thus, in the course of a year in a big works many more men will have been engaged than are permanently retained. Such a system of trial and error is patently expensive, wasteful, and provocative of disappointment and bad feeling. It has been called the problem of "labor turnover."

"When you have said labor turnover," an American employment manager wrote in 1918, "you have enunciated the greatest problem facing us to-day in the world of industry, one that embraces practically all others."<sup>58</sup> In a general sense, that is true—for it is but another expression of the major problem of unemployment. Looked at merely as a problem of material waste, an extensive turnover is serious. The experience of Henry Ford, both in excessive labor turnover and its almost entire elimination, has become classical. In 1913 he found that he had to engage and train 52,400 workers in order to maintain a labor force of 13,000—a loss of about £600,000 in a normal business year. By 1920, as a result of the establishment of his "sociological department," this turnover had been reduced to within a small fraction of the 1913 volume.<sup>59</sup>

#### LABOR TURNOVER IN NEWCASTLE INDUSTRIES.

What is the experience of Hunter River manufactories in labor turnover? Although the numbers in the various working staffs are not to be compared to that of giant enterprises, like Ford's, it is instructive to observe how comparable are the problems in America and Aus-

<sup>58</sup> Bulletin No. 15, on "Welfare Work," published by the Commonwealth Advisory Council of Science and Industry. <sup>59</sup> Bulletin, *ibid*, p. 17. See also Hy. Ford's autobiography.

tralia. When, for instance, Messrs. Rylands Bros. began their works in 1920 their labor turnover was about 300%—the 1913 percentage for the Ford works—but during the last year they have recorded a decided improvement. Even now, some 2,500 to 3,000 have to be engaged annually—or between 50 and 60 weekly—to maintain a running staff of about 1,000. Many of the men who come and go are unskilled laborers. It costs about £50 to train a skilled wire-worker. Most of the men who complete this training stay on.<sup>60</sup> The unfortunate necessity of laying off large batches of men through inability to compete with overseas makers is only indirectly related to the specific problem of engaging and dismissing in order to maintain a normal staff. At Lysaght's Newcastle Works the problem is also present. With a smaller labor force of about 300 to keep going, at least 400 men were engaged annually. Many stay at the works only a few weeks, then, finding the work very strenuous and hot, refuse to continue. This represents at least several hundreds of pounds' loss annually to the enterprise.<sup>61</sup>

Manufactures which require considerable supplies of casual labor necessarily show a large number of hirings and dismissals throughout a year, but insofar as casual employment is regarded by the management as technically necessary and desirable—which is not to condone its unhappy social consequences—its coming and going is no part of the labor turnover problem. Thus, the B.H.P. maintains an annual average of 4,500 men employed. In the skilled departments, the management claims, there is very little turnover.<sup>62</sup> Australian workmen adapt them-

60. Interview, Mr. M. Howarth. 61. Interview, Manager, Mr. W. S. Whitmore. The works at present employ about 400 men as the normal employed force. 62. The labor turnover of the Bethlehem Steel Works, U.S.A., was exceedingly high—18,300 in 1919 required annually to maintain a force of 6,800—meaning, according to the compilers of the remarkably outspoken "Report on the Steel Strike of 1919" (by the Interchurch World Movement's Commission of Enquiry), that thousands of American steelworkers as an ineffective protest against an average week of 68.7 hours—of seven days for 25 per cent. of those employed in the steel industry—and wages below subsistence for over one-third in the industry, had been "going on 'individual strikes' for several years." The Bethlehem Steel Corporation has increased enormously since 1919, with a corresponding increase in volume of labor turnover. Up till 1923 the main cause was the seasonal buying by the railroads, which necessitated a fluctuation in employment from a peak of 80,000 men to a minimum of 30,000 in an average dull season. "Instead of considering the effect on general prosperity of throwing 50,000 men out of work, we congratulated ourselves on being able to keep 30,000 in the mills." (E. G. Grace, in "Saturday Evening Post," 4.8.26). Mainly through a change in the railroads' and other steel consumers' buying policy to one of hand-to-mouth, the Corporation has been enabled to reduce its labor fluctuation—in 1925 to a peak of 66,500 and a minimum of 59,000, involving a lay-off of only 7,000, as against 50,000 under the old system. The 12-hour day meanwhile has been abolished, and wage rates considerably increased—to an hourly average of 62.2 cents.



selves very quickly and efficiently to the skill of steel making. But a fair amount of casual labor is required and can be obtained with no great difficulty—the men at the company's gates, usually between 10 and 100, generally of a migratory type, providing the source of supply.

It is mostly in the big concerns that labor turnover is a striking phenomenon, although this is not a safe generalisation.<sup>62a</sup> A large enterprise like the Sulphide Corporation manages to reduce it to negligible proportions,<sup>63</sup> while it is a notably acute problem in the relatively small-staffed printing firms of the district.<sup>64</sup> In large part the problem has its roots in the roving qualities of the Australian, and in part, more especially in the case of men with skill, to independence from pressing economic need, and perhaps (to cite the printers) to consciousness of possession of scarcity-monopoly in the skill. With the basic wage at £4/4/-, but the actual average earning nearer £5/10/-, it is not surprising that young, unmarried fellows in, say, wire-making works, will allow themselves the luxury of a month's holidaying when it suits them—undeterred by fears of inability to regain the job, and certainly untroubled by thoughts of managerial difficulties involved in their action. Further, many find it difficult to stomach shift work, and the loss of Saturday afternoons.

#### THE OPERATIVES' VIEWPOINT.

From the standpoint of the operatives the question of adequacy in the labor problem is, first of all, one of enough work for all. In assessing the influences affecting employment in 1924, a leading Union official<sup>65</sup> pointed to three important factors circumscribing the opportunities of employment in the district — (1) the relatively slow development of the B.H.P. by being confined to the Australian market; (2) the limitations upon the growth of industry through the absence of a cheap and efficient electric power service; (3) the inadequacy of the protection given. While these three limitations continue the growth of opportunities for employment in the district will be slow. The question of protection we have already discussed. It has been suggested that if the Railway Commissioners had another £100,000 to expend on their

62a. American experience shows a trend downwards in labor mobility as the size of the business grows, due possibly to steadier work, relatively higher earnings, and better conditions in large businesses. 63. Interview, Manager, Mr. H. A. Evans. 64. Mr. R. C. Pogonoski, Master Printer. 65. Mr. W. F. Read, Secretary of the Boilermakers, in interview, 24.7.24

existing electricity-generating plant in Newcastle cheaper power could be made available for the district. The restriction of B.H.P. and other steel products to the Australian market is likely to continue until international action has succeeded in raising and maintaining the standard of life in most countries somewhat near the Australian level.

In discussing the conditions of local industry which still remain unsatisfactory from the operatives' standpoint, we must not fail to recognise that Parliamentary legislation, the awards of the industrial judiciary, and the collective power of the Unions have combined, since the early nineties, to give the workers very substantial gains in both status and material comforts. These gains, it is true, are from time to time threatened and often actually discounted (especially by the chasing of wage-increases and prices around the vicious circle), and the machinery for their safe-guarding is often slow in its work.<sup>66</sup> And these same gains (it may be said parenthetically and with some justice), viewed from the standpoint of many fair-minded employers, have largely produced among employees an independence manifested in truculence and irresponsibility rather than in dignified co-operation with management in the common problems of production and distribution. Socially considered, the "gains" of the workers have both a debit and a credit side. The point is, however, that of the still outstanding dissatisfactions from the operatives' standpoint, many are not the expression of unsatisfied primary needs, like those with which labor's earlier struggles were concerned, but of expanding wants well within the scope of being questioned on the grounds of social expediency.

#### THE 44-HOUR WEEK.

Numerous interviews and replies to a questionnaire sent to officials of Unions in the district during 1924 lead to several interesting conclusions.<sup>67</sup> One is that most of the dissatisfactions were grouped around the demand which industry makes upon the workers' time<sup>68</sup>—both in extent and manner. Their deprivation of the 44-hour week by the Nationalist Government in 1922 was a source of discontent among many, although with a great many more it did not become a serious question until election

<sup>66</sup> E.g., the adapting of wages to changes in the cost of living index.  
<sup>67</sup> Which, of course, are open to correction. <sup>68</sup> Of 24 Unions (including other than manufacturing trades), from which replies were received, only four specifically mention the 48-hour week as an "outstanding grievance."

time; the vast majority, however, before its restoration by the Labor Government in 1925, did covet the shorter week. Some trades in the interim still legally enjoyed the 44-hour five-days' week<sup>69</sup>; employers in others, although entitled to restore the 48 hours, voluntarily adhered to the 44.<sup>70</sup> The Printing Industry Employees were still on the 44-hours' maximum basis, but were fearful of a general reversion to the longer week, (the Court having decided that the 48 hours might be worked if certain conditions as to health were complied with); they were very determined, however, to resist it, largely on the grounds that "four years' experience has shown that industry can stand such innovation—as witness the expansion of business."<sup>71</sup> We have seen, however, that "expansion of business" is a questionable measure of the growth of general welfare. The latter depends upon actual expansion (or, what that involves, increase in the net product of industry), but equally upon an unhurried and steady rate of the growth, and in the steady growth in real wealth per head of the population. The 44-hour week can economically be justified only if (1) it results in no diminution of the net product for distribution, and (2) if it serve as a device for more widely distributing the product, i.e., as tantamount to a general increase in real wages.<sup>72</sup> The high wage economy (for this is an argument on its behalf) deserves the genuine trial of several years' experimenting. The Nationalist State Government exhibited an all too indecent hurry, when re-introducing the 48-hour week, to prevent such a trial. The danger to be feared from the present Labor administration is an indiscriminating reversion to the forty-four in the occupations in which it is employer.<sup>73</sup>

#### OVERTIME, ANNUAL HOLIDAYS, SHIFT-WORK.

Other sides to the working-time question are overtime, annual holidays, and shift-work. The attitude of most of the Unions in the manufacturing trades is distinctly averse to allowing any extension of the practice of over-time. Most of the arbitration awards covering work in manufactural industry neglect to fix a maximum

<sup>69</sup>. Including Painters, and Brick, Tile and Pottery Makers. <sup>70</sup>. All jobbing printing establishments, and at least three furniture-making shops in Newcastle. <sup>71</sup>. Reply to questionnaire by Union Secretary. <sup>72</sup>. Economic progress would require an actual increase in the product for distribution, as well as positive increase in the workers' leisure time. <sup>73</sup>. The first half of this paragraph is intended to represent the workers' viewpoints prior to the enforcement of the 44-hour week, in all industries other than coal-mining and shipping, by the Labor Government in 1925 (Forty-four Hours Week Act, 1925).

for over-time which shall be worked, but do provide for increasing differential rates of pay as a safeguard. Among the operatives concerned, at least the Engineers, Boilermakers, Engine-drivers and Firemen, Printers, and Timber-workers aver that experience has taught the necessity for a definite legal prescription of the amount of over-time which should be permitted. And the desire for day in lieu of night work is still the root question among the Operative Bakers. An annual holiday with full pay is a desideratum well to the fore in the demands of the Printers, and of the Engine-drivers and Firemen, more particularly, in the case of the latter, for their shift-workers.

"Shift work is abominated by everyone," "totally opposed to it," "absolutely opposed," "a curse"—these are some of the replies from Union officials evoked by an enquiry as to the attitude of operatives to shift work. Shift work is a feature of Newcastle industry, particularly in the iron and steel group, and on the railways and tramways, and in coal shipment—inevitable to "continuous process" industry. But it is none the less heartily detested by those who must do it, despite the differential rates paid.<sup>74</sup> Night shifts, when they are successive, are regarded as undesirable because sleep has to be taken under unnatural conditions, especially in the heat of summer. Moreover, its effects on the home life of the district are undeniably bad. A great strain is placed on the shift-worker's wife, who, in addition to doing her household duties during the day, must have meals prepared late at night for her husband. Children must be restrained during the day while father sleeps, while the wife is harassed by disturbing callers. The home life thus becomes unwholesomely broken. The effect on the shift-worker himself is equally bad. Work under the electric light causes defective eyesight and detriment to the health generally. The shift-worker tends to become shiftless, unable to "stick a job," and thence drifts into the ranks of the "casuals."

#### THE WAGE QUESTION.

The wage question is perpetually recurrent, and is always likely to be while ever the market mechanism relating supply to demand causes daily, seasonal, and

74. Time and a quarter for engineers, boilermakers, ship painters and dockers, butchers, etc.; 8 hours' pay for 7 hours' work, or similar concession, for railway and tramway construction workers, etc.; specially assessed rates for steel workers, wire workers, etc. Overtime, being exceptional, is paid at a higher rate than shift work.

cyclical<sup>75</sup> variations in the prices of commodities and services. Nothing short of a communistic rationing system—which will create its own huge problem of adequate supplies—will provide even a theoretical alternative. We need not, therefore, be surprised that dissatisfaction with prevailing rates exists in a number of the manufacturing trades of the Hunter. The wife of the unskilled worker with the “standard” family of three children is never convinced that the basic wage determined by the Board of Trade can be made to equate the cost of decent living. The loudest complaints at present, however, are from the men in the skilled trades. During recent years they have been seeing the margin paid for the difference between skill and non-skill steadily diminishing. “We claim,” says the Secretary of the Furnishing Trades Society, “that, according to the skill required, our industry is the worst paid of all the crafts.”<sup>76</sup> “We reckon,” echoes the Secretary of the Boilermakers and Iron Shipbuilders, “the industry is underpaid in all rates—has never been paid sufficient in view of the skill and heavy nature of the work involved. Unskilled labor is more highly paid in Australia than skilled.”<sup>77</sup> The Engineers have a similar complaint to make. This insistence upon the distinctions in status in the world of operatives provides an interesting insight into human valuations, as it is also the most powerful obstacle to the ambitions of the builders of the “one big union.”

Bound up with the question of the amount of wage is that of the method of payment, and here it will be of value to discuss the attitude of operatives towards piece-work systems. There are really two attitudes—that of the operative as an individual, and that of the operatives in association. It is to the desire of each individual worker to advance the interests of his family that employers make a tempting appeal by their systems of “payment by result.” This desire refuses to be entirely subordinated to the counter-appeal for “workers’ solidarity” made by the executives of the men’s own defensive organisations, but in general the associative attitude prevails. The urge within the individual to win an independence

<sup>75</sup>. Implying changes in the general price level spreading over a period of years.

<sup>76</sup>. Answer to questionnaire. The award rate of cabinetmakers, upholsterers, carvers, and piano-repairers is £5/2/-, and the actual average wage earned between £5/4/- and £5/7/6 per week; the basic wage (Dec., 1925), £4/4/- per week. <sup>77</sup>. Answer to questionnaire.

from the restrictions of the mass<sup>78</sup> really underlies the skilled worker's chagrin at the diminution of the margin paid for skill; although officially most of the skilled unions are opposed to piece-work on the ground, among others, that it tends to destroy the skilled trades.

Of eleven important Unions whose officials expressed themselves on the question of piece-work, *one*, the Printers', admitted it to be "if anything . . . an advantage" in newspaper work (though not so fitted for jobbery work),<sup>79</sup> *one* "would prefer weekly work,"<sup>80</sup> and *nine*, in the most decided terms, expressed their hostility.<sup>81</sup> Hostility, indeed, is the general attitude of the Trade Union world, and is by no means necessarily strongest amongst the "industrialist" or "red" doctrinaire sections.

The attitude of opposition of some Unions—such as the Engineers—is universal and traditional, the result, after testing the fair promises of employers, of cruel disillusionment. Engineers in Newcastle are paid by the hour under the State award, and by the week under the Federal. The State award makes provision for piece-work, but it has never been adopted; the Federal award does so as well, but does not give the employer the sole right to fix the rates—a provision which somewhat discounts its attractiveness in his eyes.

The only occasion on which piece-work was tried in Newcastle by Boilermakers and others was under the Commonwealth Shipbuilding Agreement, in deference to the Prime Minister's pressing desire to have ships built in the Commonwealth during the war. The arrangement was that work should be carried out under piece-prices mutually agreed upon, with the condition that award time rates must be paid irrespective of the actual amount earned by the employee. The six vessels built at Walsh Island were built under this arrangement, the Engineers, however, steadily refusing to enter into the piece-rate scheme. The Prime Minister gave the assurance that pre-war conditions would be reverted to if the Unions so desired at the end of the programme.

After an experience of two years the Unions decided against the continuance of the piece-rate system. "Our experience showed," says the Secretary of the Boiler-

78. An old Italian proverb says that every man who has an associate has also a master. 79. The Secretary, answer to questionnaire. 80. Meat industry employees. 81. As follows:—Engineers, "distinct opposition"; Boilermakers, "strongly opposed"; Blacksmiths, "opposed"; Plumbers, "against it"; Furnishing Trade, "against introduction"; Bakers, "opposed to it"; Coal and Coke Shippers, "do not agree with it"; Ship-painters and Dockers, "wholly opposed"; Brick, Tile and Pottery-makers, "piece-work unsatisfactory."

makers, "that when employees earned good money, there always followed an attempt to cut the rate. The few benefited as far as money went, while their brother members outside the scheme were constantly urged up to the piece-workers' output, and received only time rates."<sup>82</sup> This is precisely the argument that has built up the traditional hostility.

The Unions' antagonism is based also on other grounds. There is a distinct tendency in piece-work, say their spokesmen, to destroy unity among the members, and, by bringing into existence sectional interests, to destroy the organisation's collective bargaining power. Moreover, piece-workers in some trades complain that court awards do not move piece-work rates parallel with day-work rates, as when, for instance, day-workers received between 1911 and 1922 advances in respect of increased cost of living of 85% as against the piece-workers' 64¾%, and, upon the introduction of the 44-hour week, in the automatic increase of 11% in hourly pay, while nothing was added to the piece-rate.<sup>83</sup> Again, there is the opposition to the tendency in piece-work to split up a trade into a number of specialised operations. Any skilled trade may be broken up into a number of semi-skilled operations. Officials in skilled Unions will quote with approval the attitude of disapprobation of such a tendency shown by Judge Beeby in framing the Board of Trade's regulations governing apprenticeship.<sup>84</sup>

82. Interview, June, 1924. 83. See letter from "Gas Meter Maker" in "S.M.H." 17.11.24, in reply to Judge Powers. 84. The opposing attitudes to specialisation were revealed in the preliminary conference of representatives of the Boiler-making trade, with Judge Beeby as President. An extract from a verbatim report of the conference may here be quoted with advantage:—

Mr. MYHELL (Metal Trades Employees' Association): "Before the Board considers the proposals of the Union, I might say the custom of the trade is to employ a man as a template maker, and he does nothing else. If you employ him as a rivetter, he does nothing else. If he is put on a punching-machine, he is kept on that. We claim the only trades the Board need touch are those we have shown, and the other is all laboring work."

The DEPUTY-PRESIDENT: "But you cannot always separate them into 'knack' activities."

Mr. MYHELL: "If we attempt to put a boy on to a particular work and keep him at that—"

DEPUTY-PRESIDENT: "There you raise the biggest question of all. Is it fair to attempt to separate the various classes of work so as to make them a series of operations?"

Mr. MYHELL: "It would make production much cheaper, and I do not think anyone apprenticed would be kept to rivetting only."

Mr. KAVANAGH: "That has never been suggested. If a tradesman comes along, you can specialise him as much as you like, but we are dealing with an apprentice learning, so that he may be specialised afterwards."

Mr. MYHELL: "But we contend that the various machines should not be claimed as machines for apprentices."

The PRESIDENT: "I would ask you to consider what that means. Cost of production, of course, is an important matter, but from the

## APPRENTICESHIP AND OCCUPATIONAL TRAINING.

The whole question of apprenticeship and occupational training is far from having been solved satisfactorily. Some Unions seem to have no complaints to make. Others complain on several counts. Workers in the Furnishing Trade, Blacksmiths, and Boilermakers, for instance, consider that the spread of instruction of apprentices in some shops is defective. In most factories in the Furnishing Trade, says a Union official, no one is deputed to look after the lads, who must pick up their instruction from the journeymen. In the large firms employing Boilermakers (says their Secretary) "our experience has been that boys have been placed on one section of the trade, and lost sight of—due to a lack of personal touch. In smaller shops the product is a much better all-round tradesman. In the bigger shops there is a tendency to keep an apprentice on the less skilled jobs." He mentions cases of boys in a big Government shop being kept on air-drilling machines for 12 or 18 months—a thing never heard of in smaller plants.

It is difficult to induce boys to take on apprenticeship in some trades—notably in the Meat Industry and Boilermaking — as there are shorter cuts to big wages in less exacting occupations. The Unions generally encourage boys to follow technical courses, which are availed of in about 80% of cases. But technical courses, in the opinion of the Boilermakers' Secretary, enable employers to evade their obligation in the contract of indenture. They use the boys for eight hours, and then require them to attend the courses up to four nights a week. The jarring work of the "rattler," for instance, over a full day is no proper preliminary to the learning of mechanical drawing. The employer, he contends, should give the boy some of the firm's time. At present, if the boy attends a reasonable proportion of the classes over a period, his fees are paid by the employer; but the State is paying for something the major part of which the employer should bear.

community point of view, is it of value that we should break up a skilled trade in which all a boy learns is a number of operations as part of the general trade? Should we break that into half a dozen unskilled operations? We should have a nation of unskilled workers."

Mr. MYHELL: "At the present time everything is claimed to be skilled which has been brought about absolutely by pressure."

The PRESIDENT: "When a boy is entering a trade where the occupation is skilled, I think it would be disastrous to see that occupation cut up into half a dozen unskilled classes of work."



Finally, there are the numerous individual cases of alleged breach of awards by employers and the isolated cases of "victimisation." A large part of any Union Secretary's time is taken up with such cases. "To get what is really due from the award" is the chief complaint of some of them. And "victimisation"—the exceptional thing, it is admitted—can be very effectively applied in a district of limited avenues of employment. "A man has only to offend about three firms," says one level-headed secretary, "and his name is 'Walker.'" It is plain, however, to discriminating observers, that not all the "victimised" deserve the protection of the Union, nor, again, are some of the men who become Union officials of a character which creates the assurance that the enforcement of award conditions will always be done with discretion—or even disinterestedly.

Despite the latent inter-class hostility which prevents a really warm co-operation between employing managements and their employees, at least workable relations have on the whole prevailed between the two in the district of recent years. Some managements claim that their relations with their employed staff are exceedingly good; and the officials of several of the important Unions, without prejudice to their independence of aggression or to their social theories, will admit the same.

Welfare schemes for employees have not been taken up very seriously. The Australian Chilling and Freezing Coy., of Aberdeen, builds homes for its employees, who buy by an easy instalment plan. Lysaghts built about 80 cottages, each fitted with a septic tank, lavatories, etc., for the trained English workers brought out to start the industry in 1921. An attempt on the part of Rylands to finance a welfare store run by the men failed because of the hostility of the Unions. The attitude of the management of the Sulphide Corporation has been to produce "welfare on the job"—leaving the men entire independence. They have a store and canteen, towards which the Corporation contributes labor and a certain amount of food, change rooms, with hot and cold showers, a sick and accident fund, and, like all the big works of the district, adequate "safety first" and ambulance arrangements. With between 700 and 800 men working three shifts when the smelteries were open, about 200 during the transition leading to the commence-

ment of cement-making, and some 350 to-day (January, 1927), the Corporation has had no disputes with its employed force for 17 years. Amongst employees generally the Sulphide Corporation has probably a better reputation than any other employing concern in the district.

### SUMMARY.

Our lengthy chapter divides itself into two portions—one mainly descriptive, the other mainly analytical. In the descriptive part a brief account is given of the various sorts of manufactures in the Hunter district. Greatest attention is given to those in the iron and steel group, which provide an admirable example of the specialisation or division of labor represented in the most modern phase of the machine economy. The descriptions include reference to the markets which absorb the various products, and involve running comments.

The more analytical section of the chapter treats of certain of the problems of the manufactural industry of the district, which can be conveniently classified as (1) the problem of industrial fluctuation, (2) the problem of competition, and (3) the problem of labor. It was seen that the Hunter River district, in common with the rest of Australia, felt the world-wide depression in industry following on the war just about 12 months after it had begun in Europe and America, and representative statistics in local employment were used to show how the manufacturing industries were affected. In discussing ways of dealing with the industrial cycle, it was suggested first that the major control could only be exercised by socially-governed central banking institutions raising the price of money when trade prosperity is on the up-grade: and that local adaptation should take the form of employers either ear-marking reserves built up during the prosperous period, or contributing to a national unemployment insurance fund, for part sustenance of their employed staffs in the period of decline; the workers' organisations on their side accepting some necessary deflation in wages, in consonance with any unavoidable downward movement in the general business cycle until the major control is achieved.

The difficulties normally met with by the local manufacturers in competition with overseas rivals on the Australian market raised the vexed question of protection.

In view of the wide variety of raw materials easily available to the Hunter River communities, an adequate supply of labor, and a growing population to serve in the Commonwealth, it was assumed that the encouragement of local manufacture is justifiable and desirable. There followed an examination of the three forms in which protection is at present given—(1) tariff duties, (2) bounties, and (3) railway concession freight rates. Certain unsatisfactory aspects of the tariffs and their administration from the Australian manufacturer's standpoint were discussed, particularly the abuse to which the form of preference to British goods had lent itself. Newcastle manufacturers, it was shown, had benefited considerably from the Commonwealth Government's bounties, but had not in any year earned up to the full amount of the provision made. The concession given by the State Government in the cheap carriage of iron and steel goods made in the State was seen to be in reality a handsome extension of the tariff protection—a usurpation of Federal prerogative strongly challenged by primary producers and representatives of British manufacturers. Evidence was given, however, to show that these concessions had some warrant in view of the disadvantage which Newcastle manufacturers experience in the relatively much higher freight rates for interstate shipping than for shipment from the United Kingdom to Australia. All things considered, it was concluded that, as local manufacturing industry is still in a somewhat precarious stage, it is desirable temporarily to extend the protection given, but, because it is equally unwise to handicap further the already sufficiently discouraged primary producer, the protection should take a form, preferably in bounties, which will spread the cost more equitably upon the whole community, and at the same time be a better safeguard against ultimate manufacturers' monopoly than is given by a revenue-producing tariff system.

Attention to the labor problem was given from the two aspects involved—that of the management and that of the operative. Both were discussed in terms of adequacy. Following an introductory discussion of the problem of "labor turnover" generally, it was shown that local experience is comparable, on a small scale, with American. With important exceptions, it is mostly in big enterprises that the problem assumes challenging proportions, and is confined solely neither to unskilled nor

skilled labor. The causes lie partly in the disagreeable rigour of some of the work required, partly in the roving qualities of Australians, and partly in the relative freedom of the majority of workers, especially the young unmarried men, from pressing economic need.

From the operatives' standpoint, the adequacy of the employment offering was seen to have a number of aspects. Opinion was cited suggesting that the growth in the amount of work in local manufactural industry would be slow (1) while locally-made iron and steel is confined to the Australian market, (2) in the absence of a cheap and efficient electric power service, and (3) while protection is inadequate. These are the external circumscribing limitations upon labor. There followed a discussion of internal limitations, expressed in outstanding dissatisfaction amongst the Unions. Investigations led to the conclusion that most of the complaints centre around the question of the workers' time. The claim for a 44-hour working week was discussed and declared to be economically sound only if (1) it result in no decrease of the net product for distribution, and (2) at the same time serve as a device for more widely distributing the product. The questions of over-time, annual holidays, and shift-work were dealt with briefly, the general hostility to shift-work being shown to be largely justified by its ill effects upon home life and upon the worker himself. Then came a discussion of wages, and especially of the outcry of the skilled Unions against the progressive diminution of the margins paid for skill. Although the attitude of the individual worker does not necessarily coincide with his "associative" viewpoint, there was shown to be a sufficiently strongly entrenched hostility to piece-work forms of payment to ensure their exclusion generally. The grounds for the Unions' antagonism were advanced, and there followed a statement of Union opinion upon the apprenticeship question, the breach of awards by employers, and the practice of "victimisation."

The chapter concluded with a short treatment of the inter-relations of employing managements and their employees, which were said to be on the whole, if not a really warm co-operation, at least workable, and to the welfare schemes in which to some small extent the former have experimented.

## CHAPTER VII.

### LIVELIHOOD IN TRANSPORT AND COMMERCE.

#### CONNECTIVE INDUSTRY OF THE VALLEY.

Commerce, as we stated in our introduction, with its intricate mechanism of markets, finance and transport facilities existing to subserve the processes of production, is the great connective activity of the industrial system. To discuss the ramifications of the markets on which Hunter River commodities play their part in exchange, or of the organisation of capital and credit facilities, would obviously take us too far afield; for local industry to-day does not establish the limits either of marketing or of finance. Beyond stating baldly that because of Sydney's disproportionately great size, Newcastle as a market and distributing centre is forced to play the role of a Cinderella, and that the fluctuations of the banking world are one as far as the whole Commonwealth is concerned, we shall not treat of the wider questions of marketing and finance, but confine ourselves to the transport facilities at the service of industry in the Valley.

These facilities are, of course, the railways, roads, waterways, port accommodation, and shipping. What can be said of their contribution to the movement of commodities?

#### **RAILWAY FACILITIES.**

By far the greatest length of railway track in the district is, of course, State property, but it is noteworthy that at least a hundred miles are privately owned, the whole of the South Maitland coalfield between Millfield Greta and West Maitland being thus served. While it is questionable if the provision for passenger conveyance by the private railways is satisfactory, it can be said that the total mileage, both State and private, caters fairly adequately for the industrial needs of the district. Only one extension is at present seriously advocated—the connecting of Merriwa (the terminus of a branch line from Muswellbrook) with the western system.

This extension — a distance of, say, 30 miles — is strongly favoured by Newcastle commercial interests in advocacy of the policy of railway decentralisation. It is urged that the most obvious outlet for much of the pro-

duce of the central west is by a rail route across the Cassilis Geocol, linking, say, Tallawang<sup>1</sup> on the Mudgee line with Merriwa, via Cassilis. If Newcastle were made a terminal port, it is claimed, commodities for export from the west using this line would gain advantages of distance and easy gradients—working out in low freight charges. Decentralisation is very properly the policy which needs strong advocacy in N.S.W. to-day. The plea for this diversion of inland traffic to Newcastle is therefore sound in principle. We may well question, however, if the mere laying down of this line will induce a flow of wheat and wool to Newcastle. There must be certain corollaries in Newcastle itself—the presence of wool and wheat buyers, and the facilities for the storing and shipping of the wool and wheat. The Chief Commissioner for Railways, when questioned by the 1924 Royal Commission of Enquiry into the Railway Service, stated that even if the carrying of wool past Newcastle to Sydney were to cost £1 per ton, the wool would still probably go to Sydney. As to the export of wheat from Newcastle, an estimated price for terminal silos had been between £350,000 and £400,000. The interest on this sum alone, at 6 %, would be £20,000 a year. With the existing storage capacity for about 6,500,000 bushels at Sydney, it would be far cheaper to the wheat-producer to continue using the facilities of the metropolis.<sup>2</sup> Sydney has become the great, successful, commercial rendezvous, and, of course, nothing succeeds like success.

Moreover, it is questionable if the savings likely to be gained in distance (about 70 miles), and in strain upon rolling stock on this suggested extension will be so great as to affect freight rates. The steepest grade on the Tallawang-Mudgee-Sydney line is at present 1 in 75—between Eskbank and Mt. Victoria. This is less steep than the existing 1 in 40 grade between Nundah and Singleton on the proposed Tallawang-Merriwa-Newcastle route. Thus in the up journey the route to Sydney actually has the advantage, though, with the ruling gradient on the down route from Newcastle to Merriwa of 1 in 40, and from Sydney to Tallawang of 1 in 30, the northern route has the advantage.<sup>3</sup> The advantage is likely to be considerable, however, only with the duplication of the section of the Great Northern line between

1. Or Leadville. Another route suggested would link Denman with Gulgong.

2. Roy. Comm. Report, p. 185. 3. Mr. H. Kirkby, District Loco. Superintendent.

Branxton and Werris Creek (strongly urged by primary producers), when the steepest grade between Newcastle and Tallawang would be made 1 in 75.

While railway facilities in the Valley are fairly adequate, the growing needs of industry are always pressing upon the existing provision. In addition, for instance, to the duplication needed between Branxton and Werris Creek, quadruplication is really required on the main line between Newcastle and Fassifern. The marshalling yards at Port Waratah are congested, but relief is already under way. The railway repair shops are about equal to the work required of them, but they are situated on a site which cramps their development as much as it does that of Newcastle itself. Indeed, the present location of the railway lines, shops, goods sheds, and station within the city—along a narrow but valuable strip of waterfront—is most patently unsatisfactory. The whole of these facilities—passenger station, repair workshops, and goods marshalling yards—should be removed to a position a few miles inland—say, at Broadmeadow, whither the locomotive works were satisfactorily transferred in 1923-1924.

#### COAL TRANSPORT DIFFICULTIES.

The colliery lines are not under Departmental control. No great difficulties are experienced in their working. To facilitate the movement of coal trains the Commissioners have built two extra roads between West Maitland and the marshalling yards at Bullock Island—this saving congestion of the passenger and goods traffic on the main line.<sup>4</sup> The haulage of coal by private trains is confined to the private lines.<sup>5</sup> No privately-owned locomotives are permitted on the Government tracks. Coal is hauled from the pits in privately-owned trucks, either by Departmental engines, or by the private engines, up to a point convenient to the Government railway, where it is taken over by a Government engine and train crew for haulage to its destination. Practically all coal haulage is in privately-owned hoppers, of which there are upwards of 13,600 within the district. The Commissioners in 1924 owned 1,547 coal hoppers, but only about 18 of these were retained in the Hunter district, and were used only to haul coal for

4. It also provides against danger of breakaways of coal trucks not fitted with the automatic break. 5. The Redhead and Wallsend branch lines are owned by private companies, but equipped and staffed by the Department, which shares the earnings.

locomotives. The Department has not made a practice of supplying its own trucks for coal carriage. Trucks for other materials are generally sufficient, except in the wool and wheat seasons, or when live stock has to be moved in large numbers in times of drought. The temporary difficulty caused by a big wheat harvest, however, has been practically overcome by the erection of storage silos in the wheat-growing centres—a boon to the railway traffic management. The farmer cannot get a negotiable instrument for his wheat until it is delivered to the buying agent. The Commissioners have supplemented the silo system, and helped the farmer get his cheque early by supplying the wheat centres with thousands of old sleepers on which the agents can stack the wheat delivered.

The transport of coal is hindered by several factors. One is in the private ownership of trucks, leading to a dearth at some mines in which business is brisk, while in others many hoppers will be standing idle. It is a counterpart of the problem of labor arising out of the separate ownership of the collieries. The collieries do not all keep a sufficiency of reserve trucks for rush orders, one consequence of which for the Railway Department is unnecessarily complicated shunting and marshalling, which is both expensive and cumbersome, in order to get train loads of empties for the mines; leading, furthermore, to great demand for yard accommodation, to delays in the despatch of trains, and generally to slow movements. The question arises, who is to provide the extra reserve of rolling stock? Trucks involve expensive capital outlay; a reserve not in constant use represents non-earning capital. The Commissioners, with the severe restrictions upon the limits of their spending power, no doubt expect the extra cost to be borne by the colliery companies, who in turn are each probably unwilling to add overhead costs in the common interest. The successive increases imposed by the Commissioners for coal traction over the last few years, of which the Newcastle Chamber of Commerce complains, probably have their origin thus partly in the industry's neglect to maintain an adequate reserve of trucks.

Another hindering factor in the haulage of coal is the condition of many of the trucks in use. Private owners' wagons are of various types and makes not



suited for modern requirements, i.e., they are of a capacity of from 6 to 10 tons<sup>6</sup> instead of at least 15 tons. Indeed, if a change to larger hoppers were undertaken, it would be a question if 40-ton trucks should not be made.<sup>7</sup> Moreover, a big proportion of those in use are very old, structurally fatigued, and are not kept in a state of efficiency equal to that of the Commissioners' rolling-stock. It is true that they are under the supervision of the Railway Department, which offsets the structural defects, in the interests of safe working, by taking loads less than those of the Departmental engines' capacities. The private trucks have mostly a weak type of draw-gear, and are without Westinghouse brakes. For what is known as the superheated T and TF and K engine, the capacity drawing load between East Maitland and Port Waratah is 820 tons, for one of the T and TF class 745 tons. But the coal train loads do not actually exceed 620 tons, because the structure of the wagons is not strong enough to withstand the shocks of hauling with a greater tonnage. This means that over and above the Departmental shortage of locomotives, there is an enforced forfeiting of energy in the colliery engines already in use. At Bullock Island marshalling yards, where conditions involve the hauling of 60 vehicles of 15 tons gross each (i.e., 900 tons) by one engine, there results occasionally the dislocation of the structure of the wagon stock. The Department is urging the improvement of their trucks upon the coal companies. If this were done, and better stacking were the rule at the collieries, the industry would have one less serious hindrance to the quick movement of its product.<sup>8</sup>

6. The Government wagons are of a higher capacity (10-12-15 tons), and are better constructed and equipped, being steel fitted, and possessing spring draw-gear, spring buffers, and Westinghouse air brake. Only a few private wagons are so fitted. The Government wagons are used chiefly for drawing coal for Departmental use on long main line hauls. 7. Chief Commissioner Johnson summed up the advantages of the proposed 40-ton truck thus: "Fewer wagons required; less damage to coal in transit from colliery to ship; a higher percentage of payable load to gross load; economy as regards sidings for full and empty wagons; facility in loading; more rapid clearance of ships; less berthing accommodation." (Reply to conclusions of Roy. Commis. on the McMyler Hoist, Sept. 13, 1909.)

8. Amongst those to whom I am indebted for valuable information on railway problems are Mr. A. Crow, District Railway Superintendent, Newcastle; Mr. H. Kirkby, District Locomotive Superintendent, Newcastle; Mr. R. F. Wylie, of the staff of the Railway magazine, "The Staff"; Mr. C. E. Lock, Chief Clerk, Railway Repair Workshops, Honey-suckle Point, Newcastle. They are in no way responsible for the opinions or conclusions above, for which the writer alone is answerable.

**THE PROBLEM OF FREIGHT RATES.**

An aspect of railway transport which has agitated the merchants of the district is that of freights. Reference has already been made to the complaints of the Newcastle Chamber of Commerce concerning the charges of the Railway Department for coal traction. To this is added the grievance of charges for coal-loading by the Department's cranes—a matter to which we shall refer below. The chief complaints of the commercial men, however, are twofold; namely, in the Commissioners' discriminating freight rates in alleged favour of Sydney firms for certain kinds of goods sent from the metropolis, as against Newcastle houses, which despatch the same lines over similar distances; and in the system of tapering rates which causes the carriage of export goods past Newcastle to Sydney. The whole position was carefully placed before the Royal Commission of Enquiry during its sittings in 1924.<sup>9</sup>

**DISCRIMINATING RATES.**

It was pointed out that the Railway Commissioners charge higher rates from Sydney to places on the southern and western lines than for towns on the northern and north-western lines, and for equivalent distances the charges for despatch from Newcastle firms are the same as those from Sydney to the south and west. Thus, for instance, a Sydney firm sending first-class goods 200 miles south or west, or a Newcastle firm despatching the same sort of goods an equal distance north or north-west, pays in each case £5/8/5 per ton, but if the Sydney firm sends north or north-west the same distance it is charged only £4/1/3 per ton. This, claimed the spokesman of the Newcastle Chamber before the Royal Commission, is an unfair discrimination against Newcastle. The Chief Commissioner for Railways, in his evidence, answered this contention first by explaining that competition with shipping had forced a reduction in rates on the down journey (outwards from Sydney) of the northern line. The complaint of the Newcastle Chamber of Commerce was misleading; he claimed, in fact, that it did not allow for the fact that Newcastle is already 100 miles nearer any northern or north-western town than Sydney. The Sydney merchant is, therefore, handicapped to the extent of at least the minimum £1/0/9 per ton charge for this distance, as against the Newcastle merchant, who imports direct and lands his goods

<sup>9</sup> Report, pp. 149 to 152.

in Newcastle. It was further pointed out that the lower scale applied equally to goods sent from Newcastle south to Sydney, and intermediate stations, as it did from Sydney northwards.

The Royal Commissioners in their report<sup>9a</sup> found that the sum of the advantages gained by Sydney merchants would not affect Newcastle trade, but that if there were any instances calling for adjustment, which they had not discovered, it would be advisable to deal with them promptly. And in the absence of specific cases of unfair treatment, there seemed little else the Royal Commissioners could conclude.

The affiliated Chambers of Commerce of N.S.W. have been urging that "one member of the Board of Railway Commissioners should be a business man, nominated by the industrial and commercial interests which contribute so largely to the Department's revenue."<sup>10</sup> It may relevantly be asked what should the "business man" Commissioner's duty be when faced with the necessity of making a business-like decision adverse to the interests of Newcastle merchants. For, judged by the business principles adopted by other railway administrations which have to meet competition, the Department is only following a universal practice. In some countries even a relatively slight competition from alternative routes has forced the adoption of special rates for special lines. Thus, although only about 15 % of the cotton tonnage between St. Louis and New Orleans is carried by river steamers on the Mississippi, the effect upon rates is very marked, the steamers virtually determining the railway rates between the two cities.<sup>11</sup> As far as our own railways are concerned, a certain amount of revenue must be got annually by the Department to make the system pay its way. The Department's rate-makers, with a knowledge of the different classes of traffic and of its distribution among the different lines, are able periodically to adjust freight rates so as to get back, *as far as possible*, costs of maintenance and running of particular lines. It is probable that to apply the lower rate of the northern line to *all* lines would not give back this minimum requirement for the whole; to charge the northern line the higher rate of the southern and western would drive traffic to the ships. It seems perfectly justifiable, therefore, for the Railway Commissioners to strike

9a. Report, p. cvi.

10. Quoted in Roy. Comm. Report, p. 154. 11. McVey, "Modern Industrialism," p. 129.

a differential rate, which will ensure at least that the northern line will attract enough traffic to pay for its up-keep. And, if every fact is to be weighed in the scales of justice, it must be admitted that Newcastle's complaint against the Commissioners is discounted by the equality of Sydney and Newcastle in the matter of freight rates by sea from Melbourne and Adelaide, and from overseas.<sup>12</sup> Seventy-five per cent. of Newcastle's imports, however, at present come via Sydney.<sup>13</sup>

#### TAPERING RATES.

The Newcastle merchants' case against the system of tapering rates is better founded, though here again it is clear that the local mercantile and wider rural interests are not, as so insistently claimed, identical.

"The main fault we have to find with the present administration," said the spokesman<sup>14</sup> of the Newcastle Chamber of Commerce before the Royal Commission, "is that what we consider to be a mistake (the laying-out of railway tracks to converge on Sydney) in the past is perpetuated in the present Commissioners in their system of tapering rates, with the result that most of our manufacturing industries are forced from the country to Sydney. Flour mills, for instance, have struggled for years, and have eventually been closed down. Meat works in the country have complained of the preferential treatment given in the freights on live stock as compared with frozen meat, although it must be perfectly obvious that in the interests of all concerned it is better to slaughter in the country and send the frozen carcasses to the coast than to do the killing at the other end. . . . We contend that the existing system of tapering rates is on a wrong basis, in that produce is carried over the last 100 miles from Newcastle to Sydney for practically nothing, and that they are inequitable in that they should cease when exportable produce reaches a port at which it can be shipped. If goods are sent from a point 500 miles from Sydney, they should not be charged a high rate for the first 100 miles, and comparatively nothing for the last 100. There should be a more business-like basis for the total rate, so that the last 100 miles charged would bear some relation to the first 100 miles charged, and the grower would not have to pay any more in the aggregate than he does now. . . . The rate for

12. Brig.-General J. Paton, Report, p. 150.

13. Mr. M. Reid, President, Newcastle Chamber of Commerce, 1924.

14. Brig.-General Paton, p. 149.

grain, flour, etc., between Newcastle and Darling Harbour is 11/9 per ton. From Inverell to Sydney this class of freight is carried 510 miles for 19/1, and the charge from Inverell to Newcastle is 17/11. So that when it comes to carrying the grain past Newcastle the Commissioners do it for 1/2 per ton for 100 miles, as against 11/9 charged the consignor at Newcastle for sending the same freight to Darling Harbour."

The Chief Commissioner defended the system in his evidence before the Commission. "We have," he said, "a lot of country that lies roughly 700 or 800 miles from the sea-board, and we will never get that area occupied if we have very high rates in respect of it. I mean, you want to put the producer who is 500 miles from the sea-board as nearly as possible on the same basis, qua rates, as the man who may be 300 miles away, otherwise you are not going to occupy that area that is 500 miles away. That is why our taper may be a little steeper than that which applies in ordinary cases. There are some commodities on which the freight rate for 100 miles, as between 300 miles and 400 miles, may be only 1/-, but it does give an opportunity for the development of those areas which are 500 or 600 miles away."<sup>15</sup>

The point of the complaint was that the rate is made almost to vanish for the 100 miles between Newcastle and Sydney—a direct inducement to the man on the land to ignore Newcastle altogether as an exporting port. A more equitable distribution of the taper upon the sections of a long journey could be arranged, it is argued, without adding either to the aggregate cost to the farmer or to the disabilities of Newcastle. The Royal Commissioners in their findings ignored this plea, as they did Newcastle's distinctly peculiar geographical position. They did not regard the objection valid "inasmuch as the principle applies in all directions, and is very unlikely to affect adversely as a whole the trade of any town or district."<sup>16</sup> This is an obvious contradiction to the experience of Newcastle. The finding has therefore left dissatisfaction still rankling in the city's business circles. It is unfortunately clear, however, that even the adjustment of tapering rates will be of little avail until the Government is prepared to spend money in giving Newcastle the proper facilities of a terminal port.

Tapering rates, apart from the use they have in a policy of encouraging distant settlement, are only one

15. Report, p. 184. 16. Report, p. cvi.

expression of the "value of service" principle of railway economics.<sup>17</sup> This principle—charging "what the traffic will bear"—underlies all forms of railway tariffs, as well as the distribution of costs to sectional services. Thus the practice of the N.S.W. Railways is to fix freights on merchandise and live stock by "charging the lowest scale of freight on those commodities which have low value, and on those which are used to aid production."<sup>18</sup> Heavy articles, like ores and coal, are carried at the lowest rates.<sup>19</sup> Wheat, hay, straw, and chaff, etc., primary products of relatively low value, are lightly rated, while the higher charges are upon the more valuable articles of less bulk. As the distance increases, the rate increases, but not proportionately. Again, as long hauls get more mileage out of engines, trucks, train-crews, etc., than a number of short hauls, the equitable distribution of the saving leads to a tapering rate. In some countries rates from large commercial centres to other similar centres at a long distance are no more and sometimes even less than those to intermediate places. This principle applied<sup>20</sup> to our own railways sometimes works very adversely against local interests, as witnessed in the unhappy position in which the Aberdeen Chilling and Freezing Works finds itself in comparison with Sydney enterprises of the same kind.

#### PORT FACILITIES AT NEWCASTLE.

Our discussion of the railways leads to the question of loading and unloading facilities at the port—a stage intermediate to that of shipping. Newcastle ranks as the third most important port of the Commonwealth, its tonnage equalling about that of Brisbane and Adelaide together. Apart from its great shipment of coal, with increasing tonnages of coke, its general exports to places beyond the Commonwealth include big quantities of frozen meats (including rabbits and hares), butter and eggs, rough timber (including sleepers), steel rails, fish-plates, pig iron, bar iron, pitch and tar, fertilisers, and some wool. Up till 1916, Newcastle's wool export sometimes reached about 30,000 bales, but under the Wool Appraisement Scheme the trade, despite local protests, was diverted to Sydney, and since the abandonment of the

17. Pigou, "Economics of Welfare," Pt. II., Ch. XV. 18. Bulletin No. 7, issued by Bureau of Information, Railway Dept., N.S.W.

19. "The Commissioners have always said that there is nothing in the carriage of coal"—Mr. A. Crow, interview. 20. Applied in the sense that stock-raisers can send more cheaply to Sydney for their slaughtering and marketing than to an intermediate abattoir.

scheme the absence of necessary wharves and loading facilities has prevented a renewal beyond some 13,000 bales. Only after persistent efforts by those in the dairy produce trade did Newcastle secure the right to become a butter and egg exporting port. It is noteworthy that Newcastle's claims in this respect were gained recognition by the wholesale organisation of the farmers, who, prior to exporting from Newcastle, were called upon to pay up to 25/- per ton extra on freights to Sydney. Public authority contributed no facilities beyond the Minister for Customs' proclamation of the city as an exporting port. Practically all the necessary cold storage accommodation has been provided by one private enterprise.<sup>21</sup> The butter, which went overseas from Newcastle during the two years immediately after the proclamation, reached nearly 2½ million pounds' weight.

The imports for circulation in the hinterland include most of the general merchandise—soft goods, food-stuffs, hardware, etc.—required by all communities, but also considerable wood and metal manufactures, including galvanised iron in much greater quantities than are locally produced.

The facilities for handling all this in-going and out-going traffic<sup>22</sup> are managed by three Government Departments—the Railway Commissioners, Navigation Department, and Department of Public Works—a triple control which produces uncorrelated practices, especially in charges for services, leading to vexations much objected to by merchants and shippers. The Works Department, for instance, builds and repairs the wharves, the Railway Commissioners control all berths for coaling, and the Navigation Department manages the rest. The Railway Commissioners berth the coaling vessels, and handle the actual loading. Each coal berth is equipped with a crane. There are 23 of these cranes at Carrington, manned by 254 employees of the Commissioners. Six of the cranes are electrically-driven; the others are of an hydraulic type—seven movable of 12 tons capacity, and ten stationary of between 15 and 25 tons capacity. At Hexham, Messrs. J. and A. Brown employ their own men and equipment (a chute and electric crane) to load their

21. Dark's Ice and Cold Storage Ltd. This firm has spent between £15,000 and £20,000 in cold storage accommodation for export commodities since 1920, and can to-day store from 90,000 to 25,000 boxes of butter as well as large quantities of cheese and eggs. (Interview with Mr. H. J. Hicks, manager.) 22. The actual quantities are published by the Newcastle Chamber of Commerce in its annual reports.

vessels, mostly "sixty-milers." In 1909, the Commissioners imported materials for the erection at Carrington of four sets of coal-loading equipment, known as the McMyler hoist. This was done in opposition to the wishes of the coal-shipping interests, and contrary to their advice. One of the hoists was built, at a cost of £68,000, but its use has been abandoned since 1916. The coal shippers have refused to use it, on the grounds that it caused damage to coal wagons, and excessive breakage of coal.<sup>23</sup>

Up to September, 1921, the Commissioners charged an inclusive rate for haulage of coal from the various railway junctions, and loading of the vessels (f.o.b.) at Carrington, but since that date, without making any reduction in the haulage rate (which has been progressively raised five times since August, 1917), they have made a separate charge of 10d. per ton for placing the coal in the ships. This has been a cause of bitter complaint by the coal-shippers, who have not hesitated to attribute the increases to the wastage of money on the McMyler hoist—"a monument to the failure of the Railway Department to understand the needs and requirements of the coal-shipping trade of the port."<sup>24</sup> But in fairness to the Commissioners, we have already suggested that the coal companies themselves have probably contributed to the increased charges by the absence of any common action on their part in replenishing the rolling-stock of the industry with sufficient and up-to-date hopper wagons.

The irregular working of the collieries creates, of course, very serious difficulties in railing and loading. The shipments for any number of consecutive weeks can never be gauged ahead. During ten weeks in 1924, the tonnages were 112,000, 107,000, 133,000, 90,000, 96,000, 76,000, 105,000, 107,000, 114,000, and 101,000—variations which meant that the same sized working staff could not be kept engaged continuously. To keep on hand a reserve staff for rushes is costly to the Department, and

23. A Royal Commission of enquiry in 1909 reported adversely upon the McMyler Hoist, recommending its removal, and the immediate substitution of movable cranes. The Chief Commissioner for Railways in a spirited defence declared that the test applied to the apparatus had been unsatisfactory. There was no reason, he insisted, why any damage should occur, even to the most friable coal, whilst sliding over a smooth and polished surface, and that no damage took place under such conditions was clear from the fact that many thousands of tons of coal had slid annually over similarly inclined shoots at the A.A. Coy's wharf at Newcastle, at Mr. John Brown's shoots at Hexham, and at many jetties on the South Coast. 24. Gen. Paton, 1924. Roy. Comm. Report, p. 152.



likely to be demoralising to the men. The staff is therefore usually less than required for a normal output. This number will prove adequate for a month or so, and then suddenly the coal output will resume its normal level, and the railway management be compelled to resort to its depots throughout the whole State for extra trained men.<sup>25</sup> These irregularities finally work themselves out in increased costs of railway service.

#### THE LOADING OF COAL VESSELS.

The crane and loading appliances of the Commissioners are only slowly being increased, and improved. The six electric cranes on what is known as the Western Basin of the Carrington peninsula (Bullock Island), where shipping aggregating 100,000 tons, including 12,000-ton vessels, is commonly berthed, were erected in 1916 at a cost, together with the wharves, of £250,000. At the service of the berths is a net-work of rail-tracks, along which are brought the coal trains, made up of from 45 to 60 wagons, each ranging in weight from 12½ to 15 tons. The locomotives bring the train as near to the wharves as is required, and then each truck is drawn by either a horse or a tractor to the crane. There are 54 of these splendidly trained animals, and eleven tractors in use. Up to 1924, horses only were employed, but, excellent as their work was within limits, it was agreed that the use of horse-power in conjunction with the mechanical cranes was becoming obsolete. Coal-loading at the Basin is therefore in a transition stage of development. Of the eleven Blackstone caterpillar tractors in the Commissioners' possession, five are being constantly worked, one is used for instructional purposes, and the remainder are usually being overhauled in the workshops. A horse and a tractor are ordinarily worked in conjunction at each electric crane. The tractor, which is driven by kerosene power oil, has proved wonderfully adaptable to the demands made upon it—used, as it is, to draw six loaded trucks at a time, with its ability to move quickly at any angle across the rail lines, with its own electric lighting

25. "In the early part of June," said the District Superintendent ("Newcastle Herald," 13th Sept., 1924), "we had a little bit of a rush. We saw that we were getting into arrears in the haulage of coal—getting late—and we got busy supplementing our staff, bringing trained men from various depots—Narrabri, Sydney, Goulburn, Bathurst, and wherever they could be snared. Having done that, and prepared for a normal output, it slumped again. We found that we could not employ these men, a matter of twenty, and had to send them away. We had to reduce our locomotive staff by that number. When the coal traffic takes a spurt again, of which we cannot get any notice, history will repeat itself."

generating for use at night, and with its elimination of the necessity for yard shunting engines. With improvements in the type of crane and the adoption of tractors, a valuable contribution should be made to the speedier, and therefore cheaper, movement of the Valley's export coal.<sup>26</sup>

#### THE CARRINGTON COAL TRIMMERS.

With the placing of the coal aboard the ships the work of loading is not finished. There remains the task of the coal-trimmers. Berths are allotted to the various shipping agents by the berthing master—a Railway Department official. The arrangements for the actual packing in holds and bunkers are made by a representative of the Port Hunter Stevedores' Association—made up of six companies of various kinds.<sup>27</sup> The Association's representative, having decided upon the number of men required for the "trimming" of a certain ship, applies to the secretary of the Coal Trimmers' Union for the necessary labor. The work is allotted to the individual trimmers on a roster system. The arrangement between the Stevedores and the Trimmers' Union is one of the most successful attempts at "de-casualisation" yet tried in the Commonwealth—even though it has not resulted in eliminating all the demoralisation of casual and irregular earnings. A brief enquiry into the advantages which it has wrought will be apropos of the transport problem.

Coal-loading is obviously an occupation more than ordinarily subject to uncertainties—in the quantities and times of arrival of coal from one direction, and of shipping from another. The disturbing problems of all waterside work—of which the public are forced periodically to become acutely aware—arise from its casual nature. Casual work has been defined as the engagement at a number of different centres of "irregular hands" for short periods, the employees, in part at least, being taken on by chance as they present themselves. Unregulated casual work involves (a) an inevitable reserve of partially employed men; (b) an increase of men required for every additional barrier to fluidity between separate engagement centres; (c) an increase of men required for every additional measure of chance in their selection. In short, the

26. The "Newcastle Herald," of 20/2/24, contained a good description of the tractor experiments. 27. Nels. Stevedore, Tug & Lighterage Coy., Union S.S. Coy., Great Northern Wool Dumping Coy., Port Hunter Stevedores Ltd., Hudson, Livingstone & West Ltd., Geo. Sanderson & Son Ltd. The Patrick Steamships Ltd., up to the time of its defeat in the struggle with the Interstate shipping ring, engaged labor from the Trimmers' Union independently of the Stevedores' Association.

less the correlation of all the factors of management and operation in a unified control, the more the surplus of men required for the given work, and the less the earnings of each man employed. That sums up the essential facts in the economics of casual employment.

At Carrington correlation has been achieved in a high degree. The Union itself first controls the entry of new labor into the field—the employing Stevedores' Association making no attempt to engage men independently. Hence the pressure of outside casuals is regulated by the Union without restricting employment. The Union executive is on a status of co-operative equality with the employing Association's representative. The membership of the Union has varied between 483 and 505 in the last six years—an index of the careful regulation of the inward flow of outside labor. A membership of 500, of course, implies that during much of the time men are only partially employed, but the restriction to this number equally implies a reduction of the inevitable reserve to a minimum. Further, with the distribution of the available work on a roster system,<sup>28</sup> a multiplicity of independent "labor markets" is avoided, mobility of labor on the water-front reaches its maximum, and the element of chance employment almost entirely disappears.

Yet even with all this careful regulation of men to work, the shortage of coal or ship arrivals at times makes the earnings of the trimmers very poor. Each man stands by about the time he expects his turn for a job to arrive. Sometimes he stands by all day in order to get a 3-hours' job. He must get paid for at least three hours. During 1924 the trimmers averaged each about 27 or 28 hours' work per week, i.e., about three turns a week of about nine hours per turn, the average weekly earning—between £3/10/- and £4—being scarcely equal to the basic wage. Sometimes a man does only one turn a week, sometimes he can work the whole week through; that is, his wage may be 13/- one week and £10 the next—a not uncommon occurrence.<sup>29</sup> Such irregular earnings can seldom be used to the best advantage, and they inevitably encourage slack and wasteful habits. But until the major problem of the guerilla warfare on the

28. The men are engaged at two bureaux, one on the city water-front, the other (much the more important) at Carrington. 29. Interviews with Mr. J. Elffe, secretary of the Union (Carrington Coal Trimmers' Federal Union—a branch of the Waterside Workers' Federation of Australia).

coalfields is solved, a completely satisfactory organisation of employment at the shipping berths cannot be achieved.

#### SHIPPING IN THE PORT.

The shipping which comes into Port Hunter is of three classes—overseas, interstate, and coastal. Among the overseas vessels are large regular “liner” steamers, steam and occasional oil-driven tramps, and sailing vessels<sup>30</sup> of many types. Among the big companies whose ships frequent the port, mainly for bunkering, though many bring and take general cargoes, are the British India, Liverpool White Star, Aberdeen White Star, Hain, Federal Shire, Commonwealth and Dominion, Blue Funnel, Commonwealth Government, Holland Australian, Messageries Maritimes, Osaka Shosen Kaisha, German-Australian Steamship Coy., and the Nord-Deutsche-Lloyd. Unfortunately, much loss of trade has resulted to the port through the insufficiency of water at its entrance, preventing the coming of the large 18,000-ton liners for bunkering. For twelve years up till 1924, no alteration had been made in the depth at the bar, which is still regarded by the Navigation Department as no more than 23ft. 6in. deep at low tide. The Public Works Department has now, however, renewed the cutting away of the rock with the expectation of making first 27 feet, and eventually 32 feet, available at low water, over a channel 500 feet wide.

Companies in the interstate trade are Australian Steamships Ltd. (Howard Smith Coy., associated with Caledonian Collieries Ltd.), Adelaide Steamship Coy., Melbourne Steamship Coy., McIlwraith, McEachern Ltd., Huddart, Parker Ltd., Lamb and Coy., Allen Taylor and Coy., and the A.U.S.N. Coy. After several years' struggle, the Patrick Steamships Ltd., which dared to start a rate-cutting war with these companies by cutting the rates by at least 10 %, was in August, 1924, forced to reduce its service.

The North Coast Steam Navigation Coy. carries coal and other cargoes to the northern rivers, and also bunkers its vessels in the port, while there is a constant coming and going of “sixty-milers” and other small cargo craft, including Messrs. J. and A. Brown's colliers, which supply coal to the Sydney gas works. There is also a continuous stream of traffic to and from the B.H.P. Steel

30. Not 1 per cent. of the total tonnage to-day.

Works—vessels (including five of the Proprietary's own steamers, and others of Scott, Fell Ltd.), with ores and flux materials from South Australia and the Pacific Islands.

Representatives of the different interstate companies meet daily in conference to endeavour to arrange matters of common commercial defence. Most of the coal cargo boats for overseas are chartered by the exporting colliery companies, but now and again one of the purely shipping companies will send away a cargo of mixed coals. In despatching a cargo of coal from Newcastle to any consignee overseas, the first document drawn up is the "charter party"—the contract between the consignor and the ship-owner, whose vessel is to be chartered. A ship may, for instance, be chartered in London. A "charter party" is drawn up in London by the London representatives of the charterers, and is forwarded to Newcastle. Then, of course, comes the "bill of lading"—which simply shows what is on the boat—made out in Newcastle, with copies, which are sent by post, and by the ship to the consignees, with the "consignees' letter," enclosed with which are also the "pit certificate" (as to the amount of coal despatched from the colliery), and consular documents.

#### PROBLEMS OF SHIPPING MANAGEMENT.

The problems of the shipping management are by no means easy. The shipping manager must first get orders—which, to-day, no longer pour in from overseas. The date of the chartered ship's arrival is never certain, and when it does get to the port it must be found a berth at a crane as speedily as possible. At the berth at as nearly the same time as possible must be marshalled the specified coal ordered in the stipulated quantities. Finally, there must be no delay in getting back the empty trucks to the colliery.<sup>31</sup> Thus to manipulate all the factors in getting coal out of the port is a complex task. The coal shipping manager becomes, in effect, subject to the grace of the miners, the regulator of the daily stream from the colliery.

Reference has already been made<sup>32</sup> to disabilities from which Newcastle manufacturers suffer in the matter of shipping freight rates. Complaints in manufacturing circles against the interstate and coastal charges are

<sup>31</sup>. For particulars as to shipping management I am deeply indebted to the late Mr. A. J. Muncaster, late shipping manager of the Burwood Collieries Ltd. <sup>32</sup>. Chapter VI., p. 117.

general. It is not easy for Newcastle manufacturers to do business, for instance, in Western Australia when the freight rate from Newcastle to Fremantle for certain goods is 45/- per ton, and from Liverpool to Fremantle 30/- per ton—a difference in favour of the overseas shipper of 15/-, although he sends his goods five times as far. If a London shipper sends goods to Brisbane, a distance of 12,000 miles, it costs him 32/6; a Newcastle merchant or manufacturer sending his goods to the same place, only 454 miles away, is charged 22/6. It is small wonder Newcastle shippers of general merchandise complain!

The interstate shipping companies say that high wages, provided for under Federal awards, are the principal cause of their high rate,<sup>33</sup> and that port and other excessive charges also contribute. Yet one daring sea-captain challenged this assertion in October, 1923, and tried to prove that the rates could be lowered considerably and be profitable. The manufacturers and other shippers immediately took advantage of the Patrick Steamship Coy.'s courageous step, but, when the ring had been compelled to bring its rates down to the new level,<sup>34</sup> they gave the company altogether insufficient support to enable it to continue. If rates have since risen again to a monopoly level, it seems that the manufacturers and merchants of Newcastle and other Australian ports are themselves largely to blame.

#### RIVERWAYS AND ROADS.

As stated in our third chapter, there is very little river-way traffic in the Valley, because the topography of the region does not provide suitable streams. A freight steamer plies regularly between Newcastle and Port Stephens, and a launch service links Salt Ash with other villages on the shores of that beautiful harbor. And passenger and light freight launches run regularly between Speers' Point and Toronto, Wangi, Belmont, and Swansea, on Lake Macquarie. A heavier type of freight steamer links Newcastle and Raymond Terrace.

33. They are entirely due, in the opinion of Mr. M. Reid, of the Melbourne Shipping Coy., to the standard of living differences between Australia and other countries of the world. 34. Freights on general cargo, for instance, between Sydney and Adelaide were reduced from 25/- to 22/6, between Sydney and Melbourne, and between Sydney and Brisbane from 20/- to 18/- a ton. A striking drop was for the carriage of salt from Port Augusta to Sydney; prior to Oct. 1923, it was 26/6 per ton, but later contract rates fell to 20/- and 21/-. Opinion in shipping circles is that these rates were uneconomical, and that the Patrick Steamship Coy. was foolhardy rather than courageous. 275,000 was lost in 30 months.

The Valley is on the whole adequately served with roads which, with notable exceptions, would be described by travellers as "fair to good." A case of the obviously defective working of the local government machinery affecting roads until the passing of the Main Roads Bill of 1924 was the continual disrepair of that part of the main road between Newcastle and East Maitland, within the area of the Tarro Shire. It was entirely unjust that the scattered farming population of this shire should have to maintain in repair a main road used heavily by through traffic, which brought nothing to the shire; and it was inevitable that the road should be neglected.

The cry for railway extension has lost much of its force since the gradual spread of motor transport, with its great advantages of relative cheapness, quick despatch, and mobility. Freight as well as passenger services are now found in a net-work all over the Hunter. Thus motor lorries connect by regular runs Newcastle with Wallsend, West Wallsend, Cardiff, Toronto, Speers' Point, Salt Ash (goods going thence by launch to Port Stephens settlements), West Maitland, Kurri Kurri, Cessnock, and Singleton. From West Maitland, others run to Kurri, Cessnock, Singleton, and Paterson. Cessnock is similarly linked with Wollombi, Scone with Muswellbrook, Denman with Muswellbrook and Aberdeen, etc.<sup>35</sup> A tri-weekly fast motor passenger service has just been established between Newcastle and Tamworth.

The future lies very largely with the easily-handled motor vehicle.<sup>36</sup> The State Government would be well advised to seek to have the Railway Commissioners' powers so employed that they will be able effectively to adapt their services to road transport in the public interest, which embraces the exclusion both of competing private services on the margin of subsistence and the successful monopoly—both of which have been experienced as nuisances on the Hunter.

### SUMMARY.

The chapter proposed to confine the discussion of connective industry to the facilities of transport, and began with a discussion upon the railway services in the

35. Mr. E. L. Bodeen (Messrs. Young & Green's Motor Service).  
36. British railways have suffered considerably from the competition of road motor vehicles, especially on some of their branch lines. At the Sept., 1926, meetings of the British Association for the Advancement of Science it was pointed out that the receipts for the financial year for the British railways had fallen by £2,000,000.

Valley. These were shown to be generally adequate. In furtherance of the policy of decentralisation, the linking up of the northern and central western systems by a line across the Cassilis Geocol is advocated, but with it must go the provision of terminal shipment facilities at Newcastle. Certain factors hindering the freest movement of commodities were examined—congestion on main lines, and especially in Newcastle, and the insufficiencies of rolling-stock, particularly because of the private ownership and distribution of coal trucks, which are obsolescent and structurally defective. Attention was then turned to the question of freights and the complaints of the mining and commercial interests examined. The latter's grievance against a supposedly great advantage accruing to Sydney merchants because of relatively cheaper rates from Sydney north than from Sydney south and west were concluded to be not very strongly founded. The system of tapering rates, it was claimed, however, does unnecessarily handicap Newcastle by encouraging the carriage of exportable primary products past its door to Sydney, when, without adding to the burden of the distant farmer, the taper could be so adjusted as to enable Newcastle to share more equitably in the export trade.

Then followed a discussion of the transport arrangements intermediate to railways and shipping, namely, the shipment facilities of the port of Newcastle. Because controlled by three different Government Departments, their correlation, it is claimed by shippers, is unsatisfactory. Coal-shippers complain strongly of the Railway Department's charges for coal haulage and loading, but, it was suggested, the coal-owners themselves are probably in part responsible for successive increases. Some attention was then given to the difficulties of railway management on account of irregularity in the output from the mines. This was followed by a descriptive discussion of recent and contemplated improvements in the Commissioners' crane and other coal-loading appliances. The work of the stevedores and coal trimmers in the actual loading of the coal cargoes on the ships received special consideration because of the notably successful illustration of "de-casualisation" which their co-operation provides. This involved a cursory treatment of the economics of casual employment, and it was shown how far the Carrington scheme has been able to solve the difficult problem of surplus labor.



After describing the types of sea-going vessels—overseas, interstate, and coastal—which frequent Port Hunter, some aspects of shipping transport were considered. It was shown that most overseas coal cargo boats are chartered by the colliery companies, and a description was given of the coal shipping manager's problems. The complaints of Newcastle merchants and manufacturers against the high coastal and interstate freight rates had, it was said, strong justification.

Finally, short reference was made to the almost negligible waterway traffic and of the road and motor transport services in the Valley, with the suggestion that the Railway Commissioners might well be empowered, both legally and financially, in the public interest, to embrace motor transport within the monopoly service they render.

## CHAPTER VIII.

### ECONOMIC DEFENCE ASSOCIATIONS.

"An association," says the sociologist, R. M. Maciver, "is a body of social beings organised for the pursuit of some common interest or interests. It stands in contrast to community."<sup>1</sup> Associations arise within a community to foster or protect the interests which groups know they have in common, but for the furtherance of which they cannot confidently trust the community as a whole. Hence they must initiate their own programmes of activity, and, if need be, organise their own measures of defence. Different associative interests may be as little alike as a poultry breeders' association and an association for the advancement of psychology and philosophy, and never come to cross purposes; others, such as may pursue, say, particular educational ends, may run parallel and temporarily converge for some wider common attainment; still others with generally concordant aims may conflict on specific issues—as with unions of the skilled and unskilled trades; while others again, existing to resist one another's encroachments or attacks (as with most employers' and employees' associations), seldom make even partial common cause with the opposing interests. The very multiplicity of non-identical and restricted common interests to be found in a modern community suggests uncompleted social correlation. Yet in so far as associations do establish common interests they are really helping to establish society; the conflicts are the difficulties of mutual adjustment. Progress in social organisation takes the painful course of gradually transforming primary group interests into wider secondary common interests.

In no sphere is the pressure to experiment in association more persistent than the economic.<sup>2</sup> It is one of the ironies of modern industrial history that adoption of the teachings of "laissez faire"—that the maximum common good will arise from unfettered individual self-seeking—should have issued in group organisations much

1. "Community," p. 150. See also his recent, "The Modern State" (Oxford University Press, 1926), in which he develops the suggestive theory of the State as an association among other associations, a *primus inter pares*, but not an entity of a different order, and, therefore, in common with other associations commanding our limited allegiance as only one of the upholders of "community." 2. There are in the United States at least 25,000 such associations having economic objectives.

**ECONOMIC DEFENSIVE ASSOCIATIONS OF THE HUNTER RIVER VALLEY**

	<b>PRIMARY.</b>	<b>EXTRACTIVE.</b>	<b>MANUFACTURAL AND CONSTRUCTIONAL.</b>	<b>MERCANTILE, TRANSPORT AND GENERAL.</b>
<b>1931</b>	<b>PRIMARY PRODUCERS' UNION.</b>	<b>NEW CASTLE CHAMBER OF COMMERCE.</b>		
	<p>Farmers' &amp; Settlers' Association of N.S.W.                      Graziers' Ass'n. of N.S.W.                      Stock Owners' Association of N.S.W.                      Fruit Growers' Assoc'n. Agricultural Bureaux.</p> <p><b>PRODUCERS' CO-OPERATIVE SOCIETIES.</b>                      The Producers' Distributing Society Ltd. and Dairy Farmers' Co-op. Milk Coy. Ltd. (serving as wholesale organisations for individual societies). Individual societies at Muswellbrook, Singleton, Scone, Denman, Cessnock, Raymond Terrace (transferred to Hexham), Branxton, Denman, Morpeth.</p>	<p align="center">Northern  Collieries  Association.</p>	<p align="center"><b>CHAMBER OF MANUFACTURES.</b></p> <p align="center">(Metal Trades Association.)</p> <p align="center">Master Builders' Association.</p> <p align="center">Master Printers' Association.</p> <p align="center">&amp;c.</p>	<p align="center">Warehousemen's Association.</p> <p align="center">Newcastle and Northern District Retail Grocers' Association.</p> <p align="center">Newcastle Retailers' Association.</p> <p align="center">Merchants and Traders' Assoc'n.</p> <p align="center">Newcastle Timber Merchants' Association.</p> <p align="center">Port Hunter Stevedores' Assoc'n. Newcastle Timber Merchants' Association.</p> <p align="center">Interstate Shipping Coys. in association.</p> <p align="center">&amp;c.</p>
<b>ENTERPRISE ORGANISATION.</b>				

<p><b>OPERATIVE ORGANISATION.</b></p>	<p>Australian Workers' Union.</p>	<p>Workers' Industrial Union of Australia. (Mining Dept.). Colliery Employees' Mutual Protective Society. Deputies' &amp; Shot-firers' Protective Society.</p>	<p>Operative Stonemasons' Society. Amalgamated Engineering Union. Australian Society of Engineers. Boilermakers' Society. Metal and Moulders' Union. Plumbers' and Gasfitters' Union. Blacksmiths' Society. Federated Ironworkers. Engine Drivers' &amp; Fremen's Assn. Brick, Tile &amp; Pottery Industry Union. Shipwrights' Union. Printing Trade Employees' Union. Ship Painters' &amp; Dockers' Union. Operative Painters' Union. Assoc'n. of Operative Plasterers. Operative Bricklayers' Union. Builders' Laborers' Union. Australian Workers' Union. Carpenters' &amp; Joiners' Society. Gas Employees' Union. Timber Workers' Union. Furnishing Trade Society. Operative Bakers' Society. Clothing Trades Employees. Meat Industry Employees' Union. Amalgmd. Coachmakers' Union.</p>	<p>Union. Carrington Coal Trimmers' Union. Wharf Laborers' Union. Seamen's Union. Firemen &amp; Deckhands' Union. Dredge &amp; Navigation Employees' Union. Storemen's &amp; Packers' Union. Shop Assistants' Union. Tramway Employees' Union. Union of Loco. Enginemen. Club, Hotel, Restaurant &amp; Caterers' Employees' Union. Musicians' Union. Theatrical Employees' Union. Fire Brigades' Employees' Union. Municipal Employees' Union. Water &amp; Sewerage Board Employees' Association. Public School Teachers' Federation. Hunter River District Secondary Teachers' Association. Railway Officers' Association. Aust'n. Rlys. Union, Port Waratah Branch. Trolley, Draymen &amp; Carters' Union. United Laborers' Protective Society. Fed'd. Marine Stewards' &amp; Pantrymen's Association. Marine Cooks', Bakers' &amp; Butchers' Association.</p>
<p><b>N.S.W. CO-OPERATIVE WHOLESALE SOCIETY.</b></p>				
<p><b>CONSUMER ORGANISATION.</b></p>	<p>Singleton Co-op. Soc. Erskineville Co-op. Soc.  Greta Co-op. Society. Boolaroo Co-op. Society. Dora Creek Co-op. Society.</p>	<p>West Wallsend Co-op. Soc. Wallsend Co-op. Soc. Cessnock Co-op. Soc.  Kurri Kurri Co-op. Soc.</p>	<p>Newcastle and Suburban Co-operative Society.</p>	

more numerous, varied and powerful than could possibly have been imagined by Adam Smith and his doctrinal successors. The relative helplessness of the individual in the economy of to-day is making wider and wider the area over which the associative principle is called to preside.

Organisation for the protection of like industrial interests in Australia tends, because of our State and Federal arbitration systems, to become co-extensive first with the State and then with the Commonwealth itself. The Valley of the Hunter is but a small portion of the whole national field. But with its population variously engaged in pursuits on the land, in mining, in manufactures, in commerce, and in transport, it can be claimed to represent almost a microcosm of national industry. We find most of the Federal and State organisations represented in the Valley by District branches, and, in addition, several which are purely autonomous local bodies, unrelated organically with similar associations elsewhere.<sup>3</sup> The most important of these organisations, grouped vertically according to industry, and horizontally according to functional economic interest, are set forth on the accompanying table.

Of the several types of enterpriser organisation, some exist almost solely to advocate and preserve rights and claims; others are the more or less effective machinery of combine-monopoly control in daily business; others, again, are actual businesses themselves, engaged in associative production and marketing; all of them are forms of defence organisation. Some, moreover, are powerful and influential, while others have their effectiveness weakened by the fickle individualism of their members. Some, further, so discuss their problems, or make their decisions, or do their works, that all the community may hear and see; others, fearful of a critical public opinion or of conceding tactical advantage to rival business interests, are furtive and secretive.

The Newcastle Chamber of Commerce is an example of the advocate type of association. Its advocacy, however, goes beyond defence of purely commercial interests, for it has for many years been the mouthpiece of the claims of the city and district in the general public interest. Indeed, with its motley membership of 129 re-

<sup>3</sup> S. S. G., the Storemen's and Packers' Union, Deputies, and Shot-firers' Protective Association, and Water and Sewerage Board Employees' Union.

presenting merchant and banking businesses, 59 the professions and other callings, 31 the mine owners, 29 the manufacturers, 25 the shipping, stevedoring and transport firms, 5 the grazing interests, and even one a primary producers' co-operative marketing society, the name of the Chamber is somewhat of a misnomer. It is really an association of several types of enterpriser—an alert watch-dog to protect their several interests as well as those of the local community in general. This very diversity of serviceableness gives the Chamber of Commerce a social value (because it is helping to transform "primary group interests into wider secondary, common interests") even though the sectional interests may not always find it the most effective instrument for their purposes.

For such more effective instruments, unencumbered by a yoke which binds farmer with manufacturer, and manufacturer with coal-owner or shipping company, and all three with merchant, we turn to the four main types of industry represented by the vertical divisions of our chart.

It will be seen that the several sorts of men on the land — farmers, graziers, stock-raisers, orchardists (including vine-growers)<sup>4</sup>—have grouped themselves into exclusive organisations for defence and advocacy of their rights, but are also united in their wider interests in the "Primary Producers' Union." The Primary Producers' Union has shown itself capable of strongly combative action, particularly in opposition to the high tariffs so patriotically urged by manufacturers' organisations. Among dairy farmers the associative principle expresses itself in two other forms—the co-operative dairy company, and the agricultural bureau—the one to secure gains of production in common, the other of marketing in common.

In the mining industry the coal owners are banded together into the Northern Collieries Association. Unlike the owners' bodies on the southern and western coal fields, the Northern Association is not a marketing agency for its members, but is purely a weapon of offence and defence against the miners, the manufacturers, the State, or any other force which threatens or calls in question the privileges of coal ownership.

The manufacturers of the district have formed a

4. E.g., the Pokolbin Vine Growers' Association.

fairly vigorous branch of the N.S.W. Chamber of Manufactures, and have thereby been enabled to exercise a collective pressure upon the Federal Government in the direction of more favourable tariff conditions. Several sectional associations, either autonomous or branches of State or Federal-wide organisations, exercise an unequal influence. Thus, on the one hand, the Master Printers' Association is a non-compact grouping of competing enterprises, big and little, held together only with great difficulty; on the other hand, the Metal Trades Association, backed by huge financial enterprise, has proved itself a formidable power for the employees' organisations in the iron trades to try their strength upon.

The wholesale warehouses and the retail traders of the city have their defence associations, but competitive activity and dissidence severely limit their memberships and their effectiveness. The Newcastle and Northern District Retail Grocers' Association, however, is a vigorous organisation of over 100 members. Organic unity is still better exemplified in such a body as the Port Hunter Stevedores' Association. This association, like the interstate shipping companies, with which it is closely allied, is virtually a "ring," which was able effectively in 1917 to "squeeze out" a co-operative society formed by the Coal Trimmers' Union to undertake the loading of vessels.<sup>5</sup>

#### A.—PRODUCERS' CO-OPERATIVE MOVEMENT.

The primary producers' co-operative arrangements deserve some special attention. The co-operative butter factory began to appear only some 20 years ago, with the coming of the cream separator, when the dairy farmers around Singleton led the way by forming a society for co-operative production. Since that time the farmers in other centres have more or less successfully followed the same course. To-day some nine co-operative<sup>6</sup> dairy companies are found throughout the Valley — at Cessnock, Hexham, Morpeth, Dungog, Branxton, Singleton, Muswellbrook, Denman and Scone. The Dungog and

5. During the brief history of the society the Union secured between £1600 and £1700 p.a. in profits. (Mr. J. Eiffe, secretary, interview.)

6. I shall throughout this chapter apply the term "co-operative" to all nine companies referred to above, although some of them have chosen to be deprived of the name rather than incur the degree of Government control involved in registration under the Co-operation, Community Settlement, and Credit Act, 1923. No alteration whatever has been made in the pre-existing co-operative basis of the companies that have made this choice. There are only two private proprietary companies for butter-making in the Valley.

Raymond Terrace (Hexham) companies manufacture butter and cheese and despatch milk either to Sydney or Newcastle, or to both markets. Muswellbrook has both a butter and milk trade. Branxton and Singleton send milk only to Sydney. All the others manufacture butter only, or, perhaps, market eggs. The two societies which make cheese have a dual butter and cheese-making plant. The advantage of this arrangement is that invested capital can be used continuously for the making of the more payable of the two commodities, whatever their relative market values at a particular time. There are no societies or proprietaries for cheese-making only in the Valley.

The aim of the dairy co-operatives is, of course, to give the member-suppliers of the milk, cream and eggs the "utmost farthing for their produce, and not the accumulation of profits."<sup>7</sup> This is done by way of a bonus of so much per pound of butter or per gallon of milk supplied. Should, however, the sales of the factory products produce a surplus over and above costs, and a declared bonus for supplies, it is distributed as a dividend on share capital up to 10 % cent., or is re-absorbed in the business.

In addition to the local societies, there are the co-operative marketing concerns which correspond to wholesale organisations. Up to the beginning of 1925, three such marketing co-operative companies were operating in the Hunter district—the Coastal Farmers' Co-operative Society Ltd., the Berrima District Farm and Dairy Coy. Ltd., and the Dairy Farmers' Co-operative Milk Supply Ltd., but in the interests of more efficient and economical marketing, the first two of these enterprises have since amalgamated, under the name of the Producers' Distributing Society Ltd., with a joint turnover of over £5,000,000.<sup>8</sup> There is no theoretical limit to the number of shareholders in this large concern, but only bona fide primary producers, or producers' co-operative societies, are permitted to take up shares. Unlike the Co-operative Wholesale Society of the consumers' co-operative movement, the P.D.S. is thus not made up of member-societies, and so is not subject to their collective control; all the buying and selling of shares being determined by a board of directors elected by individual shareholders

7. The manager, Dungog Co-operative Butter Factory (Questionnaire).

8. The P.D.S. began to function, 1st Oct., 1925. The Dairy Farmers' Co-op. Milk Supply Ltd. is confined to distribution of milk mainly from the Raymond Terrace Society.



and shareholding societies, with voting powers according to the amount of shares held.

This large producers' co-operative marketing society acts as an agent for individual farmers, for the co-operative factories, and for the newly-established agricultural bureaux. The products which it handles include not only butter and cheese, but also bacon, eggs, honey, lard, beeswax, poultry, chaff, hay, maize, oats, wheat, potatoes, onions, canned fruit, dried fruits, etc., considerable quantities of which it assembles at Newcastle from centres well beyond the confines of the Valley, and thence re-circulates. At the end of each financial year the whole of the profits, after the payment of interest on share capital, are returned to consignors in the form of a bonus, according to the amount of selling commission paid by them to the society. In this way, the Coastal Farmers' Society had, since its inception in 1900, up to the date of its amalgamation, returned to consignors over £280,000.<sup>9</sup>

Protagonists of consumers' co-operation are accustomed to deny a real co-operative basis to the large marketing enterprises of the primary producers, on the ground that they tend to become in effect the investing preserve of block-share holders, and are thus virtually proprietaries, the consumers' co-operative societies avoiding this declension from the true co-operative ideal by limiting shares and equalising voting power. But despite this objection, these large selling concerns do prove of great assistance to the small as well as the big farmer by efficiently organising the sale of his products. There is, for instance, the ever strong probability of a glut in good seasons. A few years ago such an over-production of lucerne hay occurred, and farmers were selling outright to proprietary agents at 37/6 per ton. One of the large co-operative marketing concerns was able to step in and give the farmers *in advance* 2/6 per ton more, stored their lucerne at Morpeth, sold it later as the glut wore off, and returned the net profit gained through waiting to the farmers themselves. The same kind of service has been given in the storage and sale of many commodities, the large marketing co-operative acting virtually as a co-operative credit bank. Such an organisation, by conserving perishable goods, can serve as a valuable regulator of seasonal production. Thus, the C.F.S. during

9. Interview with Mr. P. C. Boxsell, manager of the P.D.S., Newcastle.

the 1923-1924 summer season made advances to N.S.W. farmers to the extent of £120,000 upon butter, cheese and eggs, which it stored for the winter. The conserving of butter starts about February. If this were not done, the consumers would at times not get butter at all, for the production during the two months in the depth of winter, when export entirely ceases, is only about 40 % of the requirements of the State.

Difficulties have frequently arisen because farmers have sought to negotiate the private sale of their products simultaneously with the offer for sale of the same goods by the co-operative organisation. The result has been that the latter has been unable frequently to complete its sales with delivery of the commodities already privately sold. This incomplete co-operation between farmer and selling agency has lately been improved upon by the establishment of what are known as Agricultural Bureaux. The Bureau movement has spread rapidly throughout the State, some 7,000 or 8,000 farmers being now linked up in the new type of co-operative. The aim of the movement is to make the farming centres "little co-operative worlds in themselves — organising social, technical, commercial, farming, and buying and selling activities."<sup>10</sup> Each bureau is autonomous, and by its pool buying and selling seems to stand mid-way between the producer and consumer types of co-operative. Three have been formed in the Hunter district—at Bolwarra, Louth Park, and Oakhampton. The Bolwarra Bureau—the strongest of the three—has appointed the P.D.S. as its selling agent. Thus a commodity for sale is placed in the latter's hands for a definite period, say, for 14 days, during which time the Bureau makes no effort to sell itself; after that, if a sale has not been effected by the P.D.S., the Bureau tries to dispose of the goods.

Satisfactory marketing is still an unsolved problem for the farmer. He is never entirely satisfied that his products have been disposed of on the best terms possible, whether by the co-operative organisation or by the private commission agent. Against the cupidity of the latter he has no guaranteed security. Engrossing, regrating and forestalling—the sharp marketing practices of certain Chinese and white men in Sydney—are not the distinguishing evil of middle-man service on the

10. Mr. C. C. Crane, B.A., on behalf of the Agricultural Bureaux, at the First N.S.W. Co-operative Congress, reported in the "Co-operative News," May 1st, 1924.

Hunter, but equally despicable practices, e.g., agents charging the farmer a commission on goods which they themselves buy at a low price and re-sell at a profit<sup>11</sup>—are by no means unknown. Co-operative enterprise, with its book-keeping accountable to the farmers themselves, is the best guarantee against such exploitation.

Finally, an interesting aspect of the marketing problem is seen in the inter-district competition of co-operatives. A movement was initiated early in 1925 by the Denman branch in the Hunter District Council of the Primary Producers' Union to bring about the amalgamation of the butter factories of the Valley. The prime object of the proposal was so to lessen costs, to prevent overlapping,<sup>12</sup> and to give publicity to Hunter River butter, that a bigger demand would be created for it on external markets, and that the underselling in Newcastle, Cessnock and other towns of the Valley by North Coast butter would no longer be a reproach to local dairymen nor a penalty upon them because of their poor business efficiency. Thus, again, the associative principle is being called to the rescue. Parochialism, however, is proving too great an obstacle in the way of actual organisation on the principle.

## B.—CONSUMERS' CO-OPERATIVE MOVEMENT.

Before examining the defensive organisations of employees, it will be convenient at this point to discuss the consumers' co-operative movement in the district. The wage-earners' co-operative store is an older institution in the Valley than the farmers' co-operative factory, the first having been established at Wallsend in 1887. At present some ten societies of the "Rochdale" type are to be found—at Newcastle, Wallsend, West Wallsend, Boolaroo, Greta, Dora Creek, Singleton, Cessnock, Kurri Kurri, and Maitland—one or two of them still struggling in troubled waters, but most of them very flourishing businesses indeed.

It is significant that the oldest of these societies should have been given birth in a mining town. The co-operative store as an instrument of defence forged by the wage-earner consumers over a long period of trial and error since the successful initial experiment at Rochdale

11. An illegal practice under statutory law. 12. E.g., overlapping in the collection of cream. The vans of the Aberdeen, Muswellbrook, Scone and Denman companies run into each other's districts.

in 1844 has become a representative institution of the British working man and woman. The Rochdale movement in Australia, it may safely be claimed, is as strong as the proportion of British-born members within it; it certainly has not yet become thoroughly "Australian-made." This reflection is supported, at any rate, by experience in the Hunter River Valley, where, among the coal mining towns, the stores have been built up and sustained by large drafts of co-operators from overseas. Most of these folk were born into the movement, so to speak, and "the store" has all through life been as familiar to them as the post office, the railway station, or any other public utility. Many immigrants have paid their passage from savings in the Old Country co-operatives. "Dividends paid our passage" is a common remark of newcomers, whose first enquiry on reaching their new home town in the new country is: "Where is the store?"

An excellent example of the cohesion which the infusion of immigrant elements has given to the Australian movement (whose history is marked with many failures and dissolutions of wage-earners' co-operative enterprise) is the West Wallsend Co-operative Society. More than 75 % of the consumers' demands in this mining town are supplied by the store—in groceries, drapery, ironmongery, boots, boot repairs, tailoring, green-grocery, refreshments, bakery, dairy, butchery, saddlery, coach-building, blacksmithing, furnishing, insurance, newspaper supply, and even dental and optical services. West Wallsend is a town of only about 5,000 souls, and has suffered many vicissitudes through industrial disputes, slackened demand for the local coal, and even extended periods over which the mines have been closed down indefinitely. Yet in the course of 25 years' operations the co-operative society has returned £390,000 as surpluses to its members. And most of the members own their own homes, which are free of debt.

It is amongst fundamental Rochdale principles that all goods shall be bought at current retail prices, that an approximation to the current rate of interest shall be paid on share capital, and that the surpluses known as profits in private enterprise shall be returned to members at the end of quarterly, half-yearly, or yearly periods at so much in the pound upon commodities purchased. Among Hunter River societies, the rate of interest on

share capital varies between 5 % and 6 %, and the rate of dividend on purchases between 1/6 and 2/10 in the pound. While the rule of cash payments is strictly adhered to for normal transactions, some of the societies grant special credit to deserving cases in times of distress. The Kurri Kurri Society actually extended credits totalling £20,000 during the four months' coal strike in 1923, the management committee adopting a resolution that no shareholder be denied the necessities of life during the struggle so long as the store could hold out.<sup>13</sup>

#### THE PRICE PROBLEM.

The commonest criticism of the co-operative store is in the matter of its prices in comparison with those of private enterprises. It is frequently complained by members and non-members alike that in general the "store's" prices are above those prevailing elsewhere, and in some lines are unconscionably higher. The managements of the stores contend, in reply, that the differences on the whole are relatively slight, and that co-operators should be loyal enough to their own enterprises to enable avoidance of demoralising "cutting" to risky price levels. If, for instance, certain lines were bought on a high market, and a slump followed, the body of co-operators could ease their own management's difficulty by spreading, at no great expense to any individual, a loss which might prove very serious to the society as a business.<sup>14</sup> Moreover, the managements claim, the differences are more than compensated for by a knowledge that the stores never take risks with the quality of the goods they sell, that their services are thorough, that they employ no cheap or inferior labor, and that the periodical dividend will bring back to the shareholder *all* the savings which his or her loyalty eventually makes possible.

During the past two or three years the problem of prices to co-operative managements has been accentuated by the springing up throughout city, suburb, and town of what are known as the "cash and carry" store. In

13. "Our Union won out on the co-operative support!"—Mr. Teece, of the W.I.U.A., Mining Dept. (Miners' Fed'n.), at the Co-operative Congress, Newcastle, April, 1924.

14. "It would be bad business procedure to admit to such a practice if it were followed—but the practice is not usual"—Mr. R. J. Grierson, manager, C.W.S. The peculiar business difficulty caused to co-operative societies by cyclical price fluctuations is that whereas the societies try to maintain low prices during boom periods they suffer equally with private enterprises during depressions.

these stores the customers serve themselves, pay cash, and carry home the goods; very few shop assistants and clerical staff are employed; and no collectors and carters are required. Hence the ability of the "cash and carry" enterprise to sell at prices lower than those of the ordinary shop, and lower still than those of the co-operative society. Recently (1924) the Newcastle and Suburban Co-operative Society issued a leaflet, which set out in a comparative table its own prices, and those of a typical "cash and carry" shop for a representative selection of goods. It was shown that, although in almost every individual item, the prices of the latter are lower, in the total, after the Society's payment of the half-yearly dividend of 2/- in the pound, the prices to the consumer are just the same. The actual net gain to the co-operator is the convenience of having travellers call for orders and account payments, in the daily deliveries, and in the general saving of shopping worries and expenses.

The co-operative managements regard the inroads of the "cash and carry" businesses as attempts of certain merchants or combinations to prevent the success of the co-operative movement. They point out that the basic wage is not based on "cash and carry" prices, and that "industrial advocates of huge industries, such as we have in Newcastle and surrounding districts, are watching and waiting; it is scarcely probable they will miss such an opportunity to lower the basic wage." It is more probable, however, that there is no special conspiracy against the co-operative, but that "cash and carry" has commended itself to enterprising business men as simply a reasonable device for cutting costs. From the standpoint of many consumers, it represents the cutting out of the cost of *unrequired* services of delivery, etc. In the housewife's daily balancing of marginal utilities this offers very persuasive argument, which the co-operative stores should recognise as valid. It is not sound economic argument to insist that unnecessary services should be maintained simply to provide employment. If wage-earners' wives continue to support the "cash and carry" shops, it will perhaps indicate that they can with advantage forego unnecessary services from the ordinary private and the co-operative stores, and the latter might be well advised to experiment in elimination of such services. The probability is, however, that housewives in the long run will come to

realise that the savings which the "cash and carry" vogue gives them in money are actually paid for in their own energy expenditure—and then the neglect of the "legitimate" business will eventually cure itself.

#### STRENGTH AND WEAKNESS OF CONSUMERS' CO-OPERATION ON THE HUNTER.

The importance of the Hunter River district on the map of the consumers' co-operative movement is shown in the fact that the Co-operative Wholesale Society of N.S.W., the only consumers' co-operative wholesale organisation in the Commonwealth, has its headquarters at Newcastle. The C.W.S. was launched late in 1912, with the tiny capital of £403, and a membership of four retail societies. The venture was ill-timed, and, at first, badly managed. Despite these handicaps and subsequent trading losses and lawsuits, the few societies which initiated the experiment eventually, in 1922, had practically all retail co-operative stores in the State (some twenty-five) affiliated. At the end of June, 1926, the capital of the C.W.S. had grown to £46,807, its yearly sales to £518,756, and its reserves to £13,698, and it could claim to be at the service of 35,306 co-operators in 15 retail societies. The Society has a wholesale distributing organisation both at Newcastle and Sydney. Almost every day shipments of foreign goods are landed. The Society packs numerous proprietary lines, and, following the example of the English and Scottish Wholesales, has launched into manufacture.<sup>15</sup>

Unlike the large primary producers' marketing co-operative societies, the C.W.S. has no individual shareholders, its capital and government being contributed by the retail societies. It has already many times proved itself to be a formidable weapon for the defence of its constituent members against the combined offensive of private enterprisers. To take an example or two. An association of bakers influenced a miller to refuse supplies of flour to a retail society because it would not bring the selling price of bread to the level they wished. The C.W.S. countered by a decision to organise a boycott of the firm by all the affiliated societies; flour supplies immediately became available. Another co-operative society, in a town with a strong association of well-established storekeepers, found itself refused supplies (at the instigation of the association) by a large drapery

15. E.g., about 20,000 brooms are manufactured annually.

warehouse. All the societies in the C.W.S. immediately elected to cease relations with this firm. Within a week the firm changed its mind about the supplies. The association of storekeepers was informed by the C.W.S. that "the displeasure of the whole town of them counted for little against the combined weight of the N.S.W. Co-operative Movement."<sup>16</sup>

Despite the large infusion of overseas people in the memberships and the really devoted and enthusiastic service of individuals and groups, it has to be said that the movement in the district, as elsewhere in the Commonwealth, has little of the buoyant idealism which has characterised the growth of the parent movement in the Old Country. The majority of co-operative shareholders are shareholders first and co-operators second: they are virtually little more than dividend-hunters. Idealism in many spheres of thought and action is at a discount to-day, no less so in co-operative enterprise than elsewhere. The committees of management tend very definitely to reflect the outlook of the members, and give relatively much less attention to the broader and deeper social significance of their movement than to its purely business interests. Hence very little of any of the societies' surpluses are devoted to educational and propaganda work. The prosy indifference of the membership generally, and of even some of the most careful and conscientious of the executive officials to the importance of spreading a virile faith in the co-operative ideal is sorely disappointing to the few who are the real prophets in the Australian movement. It is probably the absence of economic hardship comparable with what produced the original movement that accounts, in great part, for this inappreciation of the ideal.

### C.—ORGANISATION OF OPERATIVES.

In earlier chapters<sup>17</sup> we have already discussed certain of the problems faced by organised labor; in this section we are concerned rather to describe the structure and functions of the unions and to discuss briefly some of the difficulties connected therewith.

In the first place, about three-quarters of the unions are district branches or sub-branches of Federal bodies, four of them affiliated with organisations of the same craft overseas, and about 34 with federal machinery

16. The manager. 17. Chapters V. and VI.



covering the Commonwealth. Some eight others are branches of State bodies only, and another five purely self-contained local bodies. Those with a Federal or State structure, nevertheless, enjoy a large measure of autonomy—a fact associated especially with the numerous industrial court awards and registered agreements relating either to the County of Northumberland or to particular industries in the Hunter Valley.

How difficulties of administration and leadership grow with the size of a defensive association is seen in the continual experimenting with the structure of the miners' organisation. The 13,000 miners in the north (extending as far as Gunnedah), constitute the Northern District Branch of the Mining Department of the projected one great industrial organisation already named the Workers' Industrial Union of Australia. The Mining Department is comprised of district branches—the Northern, Southern, Western and Broken Hill in N.S.W., and those of Queensland, Victoria, and Tasmania. Representatives are appointed from each district to a Council, which is convened from time to time by a Central Executive to discuss matters raised by the several district branches. The Central Executive is the general headquarters which directs the organisation, and controls finance for some 22,000 miners throughout the four States. The northern district of N.S.W. has by far the largest branch, the next in importance being that of the southern district.

The Northern Branch is comprised of some 65 "lodges," a lodge in most cases itself being composed of all the workers (excepting the relatively few in other craft organisations) connected with a colliery. A lodge may have a membership as small as 30 (Rhondda), or as big as 703 (Aberdare Central). Each lodge deals with questions arising in connection with its own mine. By a recent innovation of organisation, the lodges have been split up into groups, a group comprising from 4 to 7 lodges. The grouping is dictated by geographical convenience rather than by a desire for equality in numbers. Thus the Aberdare group is made up of four lodges and a total membership of 2,000; Greta group, also comprising four lodges, has no more than 800 members. Each lodge has two representatives in the local group committee, which in its turn corporately appoints one man to a

"board," which meets periodically in Newcastle or elsewhere, to serve as a kind of district counterpart to the Miners' Council, the District Executive corresponding in much of its administrative work to the Central Executive.

The new board came into existence about June, 1924. Prior to that there existed a numerically much bigger governing body made up of delegates — one from each lodge. It was always a costly body to convene,<sup>18</sup> and cumbersome in its machinery, for discussion and decision. In the one-day meetings each delegate had scarcely ten minutes for his contribution to the discussion, with the result that the man with really useful ideas had insufficient time for their exposition, while most of the time would be wastefully absorbed by loquacious talkers bent on repeating matter already advanced.

Unfortunately, for its ready acceptance,<sup>19</sup> the new scheme had necessarily to eliminate a number of ambitious delegates of the old board. Human nature being what it is, it seems that a result has been the sedulous fostering by the disgruntled of a feeling against the new arrangements. This serves to suggest one of the fundamental difficulties of democratic organisation.

#### FUNCTIONS OF THE UNIONS.

The variety of functions of the unions or protective organisations is determined by the nature of the callings and by the numerical and financial strength of the membership. The prime purpose of all of them is, of course, defence. Indeed, this is almost the sole function of some — not merely of the associations of the "salaried," such as Teachers, Railway Officers, etc., or of supervisors, such as Mine Deputies, but also of those in a variety of wage-earners' callings, including Shop Assistants, Storemen and Packers, Timber-workers, Water and Sewerage Board Employees, etc. Most of the organisations, however, have a "friendly benefit" function as well. It is noteworthy that non-unionism is greatest where friendly benefits are least. For instance, 20% of Timber-workers, 25% of Shop Assistants, 30% of Storemen and Packers are non-unionists—and it is in the organisations of these callings that no friendly benefit provision is

18. Upwards of £40 for every meeting. 19. "It is being sabotaged," says Mr. T. Hoare, president of the Branch. He complains bitterly of the "game of ins and outs" which some of the men seeking representation from the lodges are playing, indicating that they regard any proposal for the better administration of the organisation from the standpoint of their own personal interests.

made. In others, in which non-membership is relatively high, e.g., amongst the Meat Industry Employees, 10%, and amongst Engine-drivers and Firemen, 20%, the benefits are very small. Undue emphasis, however, must not be placed on this connection between the ratio of the unionists to the total of employees in a calling and what membership, as a form of insurance, means to the unionist. Many of the most completely organised crafts—such as the Coal and Coke Shippers—have no more to offer than the burial of deceased members.

Friendly benefits in most of the unions begin with funeral allowances and, in the measure of the organisation's freedom from costly disputes and its increasing stability, pass to provision against accident, sickness, distress (including shipwreck with the Seamen), unemployment, total disablement, and old age. Thus the Blacksmiths are limited to a £20 funeral gratuity only, the Plumbers and Gasfitters to £10 at death and £1 per week for 12 weeks for accidents, the Brick, Tile and Pottery Industry Employees to a weekly accident payment of 10/- up to a total of £5, the Seamen to £20 for funeral and £15 for shipwreck, but to no sustenance allowance against accident, sickness, or unemployment.

#### ALLEVIATION OF UNEMPLOYMENT.

It has been found impracticable for all unions, except those which are the oldest, largest, and least seldom mulcted of funds in industrial fights, to maintain regular payments to unemployed members. This, however, is done to the extent of 10/- per week by the Amalgamated Engineering Union, the richest friendly benefit craft organisation in the world. The Miners, when funds permitted, also paid out unemployed sustenance—maintained largely by regular levies upon those in work—but the strain was too great to warrant its continuance. The main purpose for which the Federation aims to conserve its funds is for sustenance during disputes, i.e., it assumes a primarily defensive function for its money resources. Such portion of these resources as has to be used to maintain the industry's reserve of unemployed labor it regards as "victimised pay," the organisation no less than the individual miner being the victim of an inequitable industrial system. "For the few months of this year," said the Miners' President in November, 1924, "that the W.I.U. of A. was making unemployment payment to its members, the Northern District received approximately

£12,000—due to the closing of West Wallsend and Duckenfield, and to one pay to Aberdare Extended during a break-down. The levy was discontinued owing to the increasing number of men coming on to it due to the closing of collieries on account of lack of trade. From the consummation of the W.I.U. of A. in 1915, the Northern District has received over £250,000, given out as 'victimised pay.'<sup>20</sup>

The friendly benefit arrangements of some skilled unions like those of the Boilermakers and Engineers have been elaborated into complex schemes of mutual insurance safeguarded by actuarial guarantees. Wage-earners' mutual insurance in friendly benefits is a part of the defence-works which they have thrown up against the harshness of the impersonal industrial system. For the effective working of the insurance principle of mutuality large numbers must be exposed to the risk against which the insurance is to be guaranteed, and the degree of the risk must be capable of measurement with some certainty. The probabilities of death, sickness, accident and unemployment move in order from relatively easy to relatively difficult calculability. The risks associated with the modern unemployment which comes to vast numbers in the irregular revolution of the industrial cycle are specially difficult to assess. It is not surprising that only the most powerful of the skilled unions of the world have succeeded with schemes of unemployment insurance. Yet it is the unskilled workers who are generally least well organised and most subject to the inroads of unemployment. It is noteworthy that European trade unions are far in advance of Australian in experimenting in schemes exclusively for real unemployment, i.e., for giving temporary sustenance to those willing to work, but for whom there is no work in their own occupation. In countries where public authority has taken any responsibility for unemployment insurance — as first by the cantons of Switzerland, later by the municipalities of Belgium, Holland, France, Germany, Denmark, Norway, and Italy, and still later by the central Governments of Great Britain, Soviet Russia, Austria, Italy, Holland, and Queensland, the practices of the unions have frequently been endorsed or used as an index of actuarial safety.<sup>21</sup>

20. Interview, November, 1924. 21. "Only where unions are strong, as in Denmark and Belgium, Great Britain and Germany, have they welcomed State subsidisation of unemployment insurance. Where they have been weak, as in France and Norway, they have been disposed to look at it with suspicion, and even with hostility"—Cohen, "Insurance Against Unemployment," Chap. VIII., p. 115.

The Amalgamated Engineers, of all the unions in the district, provide the biggest variety of benefits. The most outstanding of these are 10/- a week for sickness and/or accident, unemployment 10/- a week, dispute pay £1 a week, funeral benefit £12, benevolent grant £5 maximum at one time, and total incapacitation £100. The union has also a superannuation scheme, and even the establishing of a fund for loans to members is provided for in the Rules.<sup>22</sup>

A typically elaborate system of benefits is that of the Boilermakers and Iron Ship Builders. Provided a member has maintained a continuous membership, clearing himself at least once in twelve months, his widow or next-of-kin is entitled to £10 after one year's membership, £15 after five years, £20 after ten, £25 after fifteen, and £30 after twenty. On attaining the age of sixty after thirty years' continuous membership, he may draw half his mortality benefit. At the same age, he may, by resolution of the Branch, be classed as a "good member," and retired as honorary, with benefits preserved. An excursion into general life insurance is seen in the provision enabling a member to register his wife or widowed mother (who must not be over 45) for a mortality benefit, payable on her death. Out of a relief fund maintained by periodical levies, the Branch has given benefits in times of distress to financial members at the rate of £1 a week for married and 10/- for single men. The right to levy is the only provision in the Rules for out-of-work pay, except in the case of strikes, sustenance payment for which is made from the general funds of the Branch. For every 10/- paid in as subscriptions, 3/- only goes to the central executive of the Federation, and out of this amount all benefits are paid, as well as administrative and Federal Arbitration Court costs; the remaining 7/- is used for Branch administration, and the costs of State arbitration.

In the absence of regular contributory schemes for the alleviating of unemployed members, most of the unions follow the practice of special levies for cases of distress. Such a practice relieves the funds of a regular drain. We have already seen what difficulty even a powerful organisation like that of the Miners finds in maintaining regular out-of-work sustenance. It is true that even in a fluctuating industry the great majority of

22. A.E.U. Rules (Part I.), 1923, Rule 43, Clause 4.

men escape unemployment altogether, but a greater proportion suffers than is revealed by the mere percentage out of work at any one time. During the first six months of 1924, the average Commonwealth membership of the Amalgamated Engineering Union was 18,923, and the average number of unemployed at any one time 313, or 1.65%.<sup>23</sup> In the same period in the Hunter River district the Union's average membership was 1,051, the average number unemployed at a time 18, or 1.71%. But actually nearly 15% of the district members were without work *for some time or other* during those six months, as shown by the following analysis<sup>24</sup>—

Number unemployed for—

Less than three days . . . . .	24
3 days and less than 24 . . . . .	61
24 days and less than 48 . . . . .	36
48 days and less than 72 . . . . .	13
72 days and over . . . . .	18

That is, 152 out of an average membership of 1,051, or 14.49%, during the six months from January 1st, to July 1st, 1924, were out of work.

The analysis shows that of the 14.49% a little more than half are without work for anything up to 24 working days in the half-year—a sufficiently serious inroad upon earnings—and nearly another quarter are in still worse plight without pay for between 24 and 48 days.<sup>25</sup> The remainder approach the condition almost of “chronically unemployed,” especially the last 18, with 72 days, or over, without work. It is by no means, then, the majority of unemployed reserve in this trade who are chronically idle. An assembling of the known facts about the few who are so shows (1) that under a quarter have been unlucky owing to slackening demand for their special form of skill, (2) another quarter are disqualified by temperament, ill-health or intemperance, and (3) over a half

23. Approximately the pre-war (1913) percentage for the Union. Figures from Mr. A. S. Evernden, Pres., Commonwealth Council A.E.U.

24. Specially compiled for the author by Mr. T. B. Ward, State Organiser, Newcastle, and his assistant, Miss E. Bell.

25. Unemployment returns supplied to the Statisticians by trade unions in general relate to those members who have been out of work for three days or more during a specified week in each quarter. These returns do not indicate the average duration of unemployment in particular industries throughout a year. From the census of 4th April, 1921, however, it was ascertained that for the 137,675 males and 21,405 females unemployed throughout the Commonwealth at the time the average period of unemployment in each case was 28 days. (Second Progress Report of the Royal Commission on National Insurance, 1926, p. 6).

are either bad tradesmen, or casuals, or unreliable, or "workshy."

The statistical material used for this analysis is certainly confined to unemployment experience of a relatively small branch-membership over a brief six months' period, and any generalisations drawn therefrom may be regarded as presumptuous. Yet the experience of the selected six months may safely be regarded as typical of conditions neither of boom nor depression, and, therefore, more "normal" (an equivocal term) than otherwise. It strikingly bears out, however, what analysis of similar organisations in the United Kingdom proved to Sir William Beveridge, namely, "that the minority of irregular workmen is far too great to be dismissed as a residuum of inefficient." "The principal factor in maintaining the irreducible minimum of unemployment," he concludes, "is not the chronic idleness of a few but the incessant loss of time now by some, now by others of a comparatively large body of men, most of whom are more often in employment than out of it."<sup>26</sup>

#### PROBLEMS OF UNION ORGANISATION.

It is to be observed that each union or association has its own peculiar difficulties of organisation. With some, as we have seen, it is the problem of preventing the growth in numbers of non-union craftsmen—a potential danger to the union's bargaining power. This is a special difficulty when the workers are largely women, as with the Shop Assistants and the Hotel, Club, Restaurant, Caterers,<sup>27</sup> and Boarding House Employees,<sup>27</sup> or mobile or scattered in country centres, as with the Meat Industry Employees and Timber-workers. Other crafts, as with the iron trades, are split into rival organisations; there are, for instance, two unions of Engineers in rivalry to the A.E.U. With others again inter-union rivalry takes the form of difficulties over demarcation. Thus the members of the Ship-painters and Dockers' Union, which is recruited not by apprentices but by men over 21 years of age, drifting in from other unions, find themselves perpetually at a disadvantage because employers give their work to members of the United Laborers' or the Iron-workers, or, occasionally, the Shipwrights' Union. The employers buy in the cheapest market, for the award rate

26. "Unemployment," p. 72. 27. Two-thirds of the Hotel, Club, etc., Union (300 members) are women. They are easiest to organise in mining centres, where the sense of unionism is strong. (Interview with the late secretary, Mrs. G. Duncan.)

for the United Laborers is less by £1/13/- a week, and for the Ironworkers by £1/11/- a week, than that of the Ship-painters and Dockers; and, of course, for the Shipwrights' apprentices, (who are put to work covered by the Ship-painters' and Dockers' award), the price is ever so much cheaper. It is the case of a body of craftsmen striving to maintain the status of a distinctive skilled union without the distinctive skill, the weakness of their position arising out of the absence of apprenticeship in the craft.

Finally, the executives of all employees' defence organisations to-day complain of the great difficulty in getting the members to take a continuous, intelligent interest in their own corporate affairs. Union and association meetings in all callings are extremely poorly attended.<sup>28</sup> The same absence of interest in organised activity afflicts all sorts of bodies in the district. A typical illustration is that of a benefit lodge<sup>29</sup> of 400 members whose normal meeting attendance is seven; at quarterly meetings perhaps thirteen will be in attendance—the rest pay up their fines without a murmur. With the unions full meetings can be counted on only whenever something directly affecting the interest of the individual is transpiring (a cut in wages, etc.), or whenever some exciting battle between factional interests is expected.

The general neglect of organised life in its normal expression arises, probably, partly in the Australian's dislike of any kind of regimentation, partly in the excessive after-war reaction from serious to relaxing interests, and, most of all, in the absence in the labor movement to-day of anything but a shallow idealism, exhausted alike of thought-content and spiritual quality, which is content to work itself out in the pursuit of the grossly material or the trivial.

### SUMMARY.

This chapter opened with a discussion of the nature of associations in general and of those for economic defence in particular as a preliminary to an examination of the defence organisations on the Hunter. Attention was first given to those grouping together the various sorts of enterpriser, some of them being seen to be confined rather to the advocacy of rights and claims, others

28. Trade union facts used in this chapter have been gathered from personal observation, interviews with union officials (to whom I am indebted) and replies to a questionnaire. 29. At Adamstown.



to the practical business of more or less corporate production and exchange. Representative examples of such enterpriser association were instanced in primary industry, mining, manufacture, and commerce.

A special section of the chapter was devoted to the co-operative movement amongst the primary producers. The distribution throughout the district of the co-operative dairy societies and their methods, as well as those of the larger wholesale co-operative, marketing organisations, were described. The functions of the latter as agents for the individual farmer, the society, and the newly-formed agricultural bureau, were analysed, and their value as an instrument for organising marketing for the farmer and for saving him from exploitation emphasised. Some attention was also given to the new Agricultural Bureau movement which purposes to fill an awkward lacuna between the co-operating producers' butter factory and the co-operating consumers' retail store.

Attention was then turned to co-operation among consumers. It was shown that the Hunter River Valley is an important part of the field over which the movement is at work, largely because of the presence of mining centres built up largely by overseas people who have brought with them from Britain a strong traditional sense of the value of co-operation. Examples of the successful working of the co-operative "store" were given. Then followed a discussion of certain of the practices of the societies, including the problem of prices. How this problem has been accentuated by the recent rise of the "cash and carry" business was explained, and the question was raised as to whether this type of business was not pointing to the need of eliminating unrequired services, which add to prices. Then followed a description of the work of the Co-operative Wholesale Society and of the difference of its structure from that of the primary producers' wholesale marketing organisations. Illustrations were given to show its effective power as a weapon of defence for the retail societies against the combined attacks of enterpriser associations in proprietary business. The section concluded with a brief discussion of the relative weakness of the Australian movement — attributed to the weakening of the idealism of the movement and to the general absence of the kind of economic

hardship out of which consumers' co-operation originally arose.

The final section of the chapter examined the structure and function of the defence organisations of operatives in the Valley. After referring to the relation of the local bodies to wider organisation, which may or may not embrace them, the structure of the largest—the Miners' Union—was described in some detail, and some of its problems emphasised. Then came a discussion of the variety of functions exercised by employees' organisations generally—from union merely to fend against attack to association for elaborate schemes of mutual insurance. What a union can do, it was shown, depends upon its age, size, freedom from exactions of industrial disputes—in short, upon its numerical and financial stability. The greatest difficulty, it was seen, lies in making adequate and regular provision for help to members against unemployment—the experiences of the Miners being cited for illustration. Typical elaborate friendly benefit schemes were described, and the principle of mutuality in relation thereto discussed. This led to an examination of the problem of the unemployed reserve—discussed in relation to the district branch of the Amalgamated Engineering Union. Analysis showed that inefficiency on the part of the individuals entered very little as a factor making for the unemployment with which the Union has to contend. The chapter concluded with a treatment of particular difficulties of inter-union rivalry and of the universal difficulty of the apathy of the rank and file to union affairs—the latter condition being due partly to psychological causes and partly to the absence of an inspiring idealism in the labor movement of to-day.

## CHAPTER IX.

### THE PEOPLE AND THEIR OCCUPATIONS.

The foregoing chapters have in the main described and analysed the processes by which the people as a whole are adapting the material resources of the Hunter River Valley to the needs of livelihood. We shall reserve our final chapter to an attempt to trace more specific ways in which they are being affected and influenced by their industries.

We shall be content to trace the relationship in population distribution, in hazards to health, and in the general habits and outlook of the people.

#### A.—INFLUENCE OF OCCUPATION ON POPULATION DISTRIBUTION.

Approximately 225,000 people dwell within the limits of the Valley as defined by the appended maps. Over 118,000 of these live within municipalities and the remainder within shire areas, but as some of the shires include large towns without municipal government — Cessnock Shire, for instance, embraces upwards of 36,000 people living in the mining towns of the South Maitland coal field—it can safely be assumed that about three-quarters of the people of the Valley are town-dwellers. That in itself is an important fact in enabling us to distinguish a Hunter River type of “provincial” unlike the product of other country districts of Australia.

By far the biggest number of the town-dwellers are, of course, to be found about Newcastle and its ten suburban municipalities. Here there are aggregated over 98,000 people, of whom some 38,000 are bread-winners. How are the bread-winners distributed among occupations? It is illuminating to observe that at least 18,700 of them are engaged in manufacturing, construction of buildings and roads, etc., another 5,500 in transport and communication, about the same number in commercial pursuits, 3,500 are employed in mining, 3,100 in domestic work, and 2,650 are professionals.<sup>1</sup> In 1875,

1. Worked out from figures supplied by the Commonwealth Statistician (on basis of 1921 census) and State Statistician (1925 returns). With an increase in the aggregate population of Newcastle and suburbs has gone an increase in intensity, as shown in the following census figures:—

Population.				Persons Per Acre.			
1891.	1901.	1911.	1921.	1891.	1901.	1911.	1921.
50,662	54,991	55,350	86,256	2.63	2.83	2.92	4.46

we have previously had occasion to state, Newcastle was a busy little port, with a population of 7,580, engaged mainly in mining and shipping. The efflux of miners to the South Maitland field from the beginning of the century and the influx of a large mobile artisan and general laboring class since 1915 have entirely re-distributed the occupation-proportions of the population, and altered its character. Newcastle to-day, in spite of its coal shipping importance (4,688,356 tons, worth £5,051,687, were shipped in 1924), is essentially a manufacturing centre.

Newcastle is the third shipping port of Australasia. During 1925 a net tonnage of 4,893,033 in 5,080 vessels passed in and out of its harbour. The growth of export and import trade, apart from coal, is steady, the imports of general goods in 1925 being worth £1,572,557, and of exports £982,224. The city's general economic increase during the last eleven years may be measured in the growth in land values. Unimproved values in 1915 were £1,619,559, and at the end of 1926 £3,882,175; improved values in 1915 were £3,695,822, and at the end of 1926 £7,415,090. For 1926 the unimproved capital value of Newcastle City and its ten suburbs was assessed at £8,382,815, and improved capital value at £23,077,438.<sup>2</sup>

Outside of Newcastle and its environs the next largest aggregations of population are, of course, among the towns of the South Maitland area. How the swift growth of some 40,000 people along this tract came about we have already described. In Cessnock alone buildings during the past two years have been completed at the rate of one a day continuously, and homes are fast springing up among all its dependent villages. The population of the Cessnock congeries reaches over 21,000, and is overwhelmingly made up of miners' families. The two Maitlands, as we have seen, form a more definitely distributing centre for the primary producers, their combined population of 12,720 (West 8,860, East 8,860) being made up largely of local and Newcastle business people, retired farmers, professionals, miners, artisans, etc. Of the remaining rural centres, the more important (Single-

2. From Mr. J. Glassop, Town Clerk. The general rate for Newcastle is less than 3d. in the pound, the possession of large unimproved and improved city properties by the Council (bringing in an income of about £25,000, equal to half of that from the rates) relieving the ratepayers considerably.

ton 3,270, Muswellbrook 2,340, Greta 1,580, Murrurundi 1,530, Dungog 1,880, Scone 1,820)<sup>3</sup> are railway towns.

During 1925, throughout what the State Statistician describes as the Hunter (which embraces Newcastle and suburbs, with eight outside municipalities and eight shires—the most important areas), the estimated mean population of 215,660 included a natural increase of 4,290; the year's natural increase of Newcastle and suburbs alone was 1,873 upon a population of 96,400, and upon Cessnock Shire's 35,410, it was 822. It is not by its excess of births over deaths that the population of the Valley is growing fastest, but by migration from other parts of the Commonwealth, and from overseas. The figures cited can give no measure of the large "floating" population which passes annually in and out of the district.

#### B.—POPULATION AND LOCAL GOVERNMENT.

One important result of the changing distribution of the population in the Valley has been to make local government machinery ill-adapted to changing needs. The embracing, for instance, within a single shire the concentrated mining populations of Cessnock, Kurri Kurri, and other growing coal field towns, with the surrounding scattered farming population, is re-acting very unfairly on the latter, whose interests (e.g., good roads) are completely subordinated to those of the miners.

On the other hand, the population of Newcastle, with its eleven municipalities and at least two shires, has inherited an absurd multiplicity of self-government for a community which to-day is really one civic unit. The shortcomings in the working effectiveness of all this machinery have led to a now long-drawn-out agitation for some more unified form of administration. The more important defects of the existing arrangements are found in (1) the overlapping of administration of public authorities in (a) public health,<sup>4</sup> (b) control of traffic,<sup>5</sup> and

3. Figures for end of 1925. 4. One notorious instance being the menace to public health of a drain in which five different administrations (the Newcastle City Health Dept., the Local Government Health Officer, the Health Dept., H.Q. in Sydney, the Hunter District Water & Sewerage Board, and the Public Works Dept.), and one citizens' body (the Junction Progress Association) were concerned—mainly by way of repudiation of financial responsibility for its repair. 5. Each Municipal Council controls the issue of licenses to buses in its area, including general licenses to travel in any part of the State, leading to disunity and inter-Council quarrelling over motor-bus time-table control. Moreover, the City Council controls

(c) maintenance of arterial roads;<sup>6</sup> (2) the absence of any comprehensive control of town planning; (3) no district policy of adequate housing and transit; and (4) unnecessary multiplicity of working personnel, with insufficient or inefficient equipment..

These insufficiencies were emphasised by the Royal Commission of Enquiry into the question of a constitution of a Greater Newcastle in 1919. The sittings of the Commission were spread over nearly a year, and a report was issued recommending the setting up of a single local governing unit. The territory to be so governed was to be divided into two parts—(1) an "essential area," comprising the municipalities of Newcastle, Adamstown, Carrington, Hamilton, Lambton, New Lambton, Merewether, Stockton, Wallsend, Waratah, and Wickham, and parts of the Shires of Lake Macquarie, Tarro and Port Stephens, i.e., the more thickly populated areas of the business, factory, shipping, and residential city and suburban community, and (2) an "outer area," of thinly-populated fruit-growing and farming land or vacant spaces within the three shires, into which the population of the inner "essential" area must eventually overflow.

The actual government, it was further recommended, should be carried on by a Council of 20 members, functioning chiefly in departmental committees, elected by five electoral divisions in the "essential area," with six additional co-opted members to serve on the departmental committees, and a mayor to be elected by the people for two years, the Council itself sitting for four years, with half the members retiring at the end of every two years. Preferential voting was suggested, but no recommendation was made as to what should be the basis of the franchise—one of the serious contentious questions which have since held up the consummation of the scheme. The actual administration was to be carried on by a "general manager." The powers of the new Council were to be, as far as the "essential area" was concerned, all those set out in the Local Government Act of 1919, with certain others in addition, and, as far as the "outer area" was concerned power over land subdivision and the expenditure of money on various utilities and devices. The

taxi-cabs and the Police Department all private vehicles; the Council has to spend about £1200 a year for traffic constables of its own, the Police Dept. being required to do this for Sydney, but for no other towns. 6. Newcastle Council has spent £30,000 in concreting the part of Hunter Street within its control, but Wickham and Hamilton have been unable financially to do the same on their portions of the same street.

powers to transfer, resume or establish utilities, services and undertakings recommended to be vested in the Council were, in some respects, wider than any hitherto granted in N.S.W. to local governing bodies, and covered electricity, abattoirs, fire brigades, water and sewerage services, tramways, gas, ferries, municipal hospitals, convalescent homes, baby clinics, and communal kitchens. The total assets and liabilities of the existing Councils were to be pooled.

The recommendations of the Commission have not received the unanimous acceptance of the Councils concerned. While there has been a deplorably apathetic interest in the whole matter manifested by the people generally, the aldermen in the various Councils have been splitting and re-splitting into fiercely contending groups. One of the main bones of contention has been the proposed inclusion of the water and sewerage services, not only of the district within the Greater Newcastle area, but of the Maitland coal field. Objectors to their inclusion apparently fear less efficient administration should the existing *ad hoc* body<sup>7</sup> (on which the local municipal and shire bodies have group representation) be merged in machinery in which it will exercise less independence. Advocates of its inclusion, on the other hand, point to the borrowing restrictions at present placed on the Board, which is dependent for its means upon the policy of the Government of the day, despite the fact that all its surpluses are absorbed in the consolidated revenue of the State.

Were these and other public utilities, not even excluding the tram and bus services, under a common district control, it is probable that loan moneys could, on the basis of local assets, be obtained more freely for their extension than through the State Treasurer. Moreover, there seems little reason to suppose that the inclusion of the machinery of the existing *ad hoc* bodies would mean substantial alteration of their present routine, save only that better correlation would be achieved. What can be done efficiently by the extension of municipal administration to include similar services in other countries ought to be possible in an Australian community.<sup>8</sup> Unfortunately, stubborn parochialism, vested interests in existing arrangements, and a general fear on the part of ratepayers

7. The Hunter District Board of Water Supply and Sewerage.

8. Municipal Councils control two-thirds of the water supply of the Boroughs of England.

that, if adult franchise be adopted, the control of the Greater Newcastle Council will be the sport of the more irresponsible, if active, elements of the democracy, are combining to prevent any forward move. Several alternative schemes<sup>9</sup> have been, and are being, advocated, but the numerous inter-municipal and other conferences in which the issues have been fought out have not revealed enough unanimity to enable Parliament to know how to legislate.<sup>10</sup>

Public utility services are being efficiently rendered by the existing Newcastle City Council, especially in its electric supply department, which has been in operation many years as a witness to the capacity of public authority to run a business enterprise successfully. The Council draws its main supply of current from the Railway Commissioners' power-house, and reticulates it over the "inner area" of the Greater Newcastle scheme. Power for private lighting is sold at from 3d. to 4d. per unit, and for industrial purposes at from less than  $\frac{3}{4}$ d. to 2d. These rates are amongst the lowest in Australia. The Railway Commissioners supply power also to most of the railway towns of the Valley as far as Muswellbrook. At Greta and Branxton the Commissioners' power is distributed through the Newcastle Coal Coy., while other collieries supply Belmont, Cardiff, Wallsend, and West Wallsend. Towns on the private railways are in each case lighted by the nearest power mine.

### C.—INFLUENCE OF OCCUPATION ON HEALTH HAZARDS.

We may now turn from the changing distribution of the population and the corresponding changing demands being made upon local government services to the more direct relationship between the people's occupations and themselves. Is it possible, for instance, to measure any effects of occupation upon physical well-being?

Unfortunately, little has yet been done by public health and other authorities to take actual measurement

9. E.g., amalgamation and County Council schemes, the former for the coalescing of certain of the municipalities, the latter for the formation of a Federal Council for certain functions, mainly centering in town-planning control, with the retention of the existing Councils with most of their present powers; both schemes rejecting the inclusion of abattoirs, water and sewerage and other services contemplated by the Royal Commission's Greater Newcastle scheme. 10. At the end of 1924 the Minister for Local Government in disgust at the contrariety of opinion dropped the Bill proposing to take a plebiscite.



of health hazards in Hunter River industry. The Commonwealth Department of Health has certainly issued several interesting pamphlets on the subject generally, one of them containing an elaborate list of hazards, their symptoms, and the occupations affected; but so far as the writer is able to discover, the great majority of the diseases or disabilities mentioned therein are scarcely in evidence at all amongst Hunter River workers in occupations in which liability to such is supposed to be present.

The commonest hazard, apart from injury directly caused by accidents, seems to be septic infection, and this is peculiar to no particular occupation, but occurs wherever men are careless about abrasions. Abnormalities of temperature, excessive light, and fumes, according to a Newcastle medical doctor accustomed to handling industrial patients, cause far less physical disabilities than is commonly supposed. The writer, however, has heard complaints to the contrary, and has actually witnessed the injurious effects of acid fumes upon workers' teeth.<sup>11</sup> Coal dust, which is carbonaceous, unlike the dust in metalliferous mines (as at Broken Hill), is not harmful to the lungs, and does not cause chronic phthisis or tubercular complaints among coal miners. Some of the raw material used in the iron and steel industry, e.g., ferro-manganese alloy, which, in the presence of water, gives off phosphine gas, makes its handling by the men who unload it from the ships an unhealthy occupation.<sup>12</sup>

The Hunter River Valley is regarded by public health authorities as the most goitrous district in N.S.W. There appears to be no relationship, however, between occupation and goitre. Diet, it seems, may be a contributory cause, but grave suspicion is attached to water supply.<sup>13</sup>

11. In the "pickling" department of a galvanising works, where iron sheets are bathed in a 5 per cent. solution of sulphuric acid. The bath gives off dense white fumes. In conversation with a representative of the management and a workman on the job, I was assured that these fumes, though pungent to a visitor's nostrils are harmless. The workman, however, showed his teeth, which were jet black along the biting surface and acid-eaten along the face. All the men in this department, he told me, become thus affected.

12. "Phosphine when inhaled is said to cause giddiness, debility, loss of appetite, pain in the chest, and thirst."—Dr. Badham, Medical Officer of Industrial Hygiene, in his report upon samples submitted. 13. Dr. Harvey Sutton, Health Officer of the Dept. of Education, in a communication to the writer, pointed out that the complaint is much less frequent, even in goitrous areas, where water supplies are safeguarded, especially if the water is sandfiltered. There is, I understand, no sand filtering of the Chichester water supply of the Hunter District, though the water passes the Health Dept.'s tests.

## ACCIDENT HAZARDS IN THE INDUSTRIES.

The chief hazards in industry, however, are not diseases but accidents. Record by public authority of accidents occurring in Hunter River industries does not cover fully all such happenings, and, being in the hands of at least three Government Departments—the Department of Labor and Industry (administering the Factories and Shops Act, 1912-1915, and the Workmen's Compensation Act, 1916), the Mines Department (the Coal Mines Regulation and other Acts), and the Railway Department—is not summarised usefully for comparative purposes.

A "factory" within the meaning of the N.S.W. Factories and Shops Act is any building in which four or more persons are engaged upon any handicraft, with or without the aid of mechanical power. Coal mines do not come under this category, and such places as shearing sheds and buildings for the manufacture of dairy produce are specifically excluded. In the Newcastle district at the end of September, 1925, there were 1,228 such factories registered, employing 13,103 people, of whom 91 % were men and boys, and 9 % women and girls. At the same date, the registrations for the whole State were 11,559 (employing a total of 134,716), so that Newcastle and district provided one-tenth of the manufactures of the industry of the State, and a little more than one-third of the factories (3,480) outside of Sydney.<sup>14</sup> If we consider that upwards of 12,000 persons are constantly employed with tools and machines of all kinds, the reported number of accidents for four successive years in Hunter River factories—87 in 1921, 126 in 1922, 208 in 1923, and 342 in 1924, with only nine fatal during all that period—is surprisingly slight. But that these records by no means include *all* accidents which cost disability and money in manufactural industry (many not being notifiable under the particular section of the Factories Act) is shown in the returns of one big works—the B.H.P.—alone in connection with workmen's compensation. In 1923 the company paid out in compensation £8,868—for one fatal and 520 disablement cases.<sup>15</sup> Analysis of the cases reported under the Factories and Shops Act, however, is valuable in showing that most of the injuries each year are to hands,

14. 1924 Report of Dept. of Labor and Industry on the working of the Factories and Shops Act.

15. N.S.W. Industrial Gazette, 31/8/24, p. 140.

arms and feet, lacerations and burns being by far the commonest hazards. Injuries to the eye are also frequent.

#### HAZARDS IN COAL MINING.

In coal mining during the decade 1913-1923 on the northern field, according to notifications made to the Mines Department, 143 men working about the mines lost their lives, and 755 non-fatal accidents occurred. But again it is instructive to deduce from the official returns of compensation payments in the Department of Labor and Industry that the number of accidents was really much greater. Excluding altogether compensation in connection with the Bellbird disaster (when 21 miners lost their lives), in 1923, for instance, payments of £3,311 were made by 33 coal mine proprietors for seven fatal and £26,598 for 3,311 disablement cases.<sup>16</sup> During the ten years, 1913-1923, the number of men working in and about the mines increased from 13,469 to 16,104. The death-rate from accident per thousand of underground workers, according to the Mines Department's records, varied between .6 for 1922 and 2.4 for 1923, the average for the decade being about 1.2.<sup>17</sup> This compares very favourably with mining in America and the United Kingdom. The U.S. Bureau of Mines reported a death-rate in its coal mines in 1914 of 3.19 per thousand, or between 4 and 5 men killed for every million tons of coal raised. In the northern district of N.S.W. for that year 646,736 tons were raised for every life lost (i.e., less than 2 men killed per million tons mined)—a figure approximating the average for the 1913-1923 decade. The proportion for the southern and western districts is still more favourable. For the whole State a life was lost in 1923 for every 741 men employed, and the death-rate per million tons raised was 2.96—an abnormally high figure, due to the explosion disaster at Bellbird. The corresponding figures for Great Britain for 1922 were one life lost for every 950 employed, or 4.4 killed for every million tons raised; so that the normal death hazard in American and British mining is ever so much higher than in an abnormal year in this country. By far the greatest number of accidents at local mines occur underground, and most of these are due to falls of coal.

16. Industrial Gazette, *Ibid.*, p. 141.

17. For the decade 1916-1925 the average was approximately the same, *viz.*, 1.12 per cent.

## THE ELIMINATION OF HAZARDS.

In the Hunter River district, as in other industrial regions where the unbreakable recurrence of accidents at employment is a disturbing factor in life, considerable attention has been given to the possibility of their elimination or reduction. The instalment of safety devices represents a reversal of the old policy in industry of making men adapt themselves to machines; now the tendency is to adapt machines to fit the psychic life of men, i.e., their tendency to fatigue, their weaknesses, their habits, etc. To what extent has the new policy been embraced in and around Newcastle? It is instructive to read in the reports of the factory inspectors of the district such statements as these:—

(1) "With the exception of butchers, practically every employer has provided guards for all machinery and mill-gearing, although I have found in many mills that the essential riving knife had 'just been tied up to put a new saw in,' or similar excuse."<sup>18</sup>

(2) "It is my experience that without constant visitation many employers get lax in providing fencing for machinery. The standard of guarding is improving."<sup>19</sup>

(3) "Although the conditions generally tend to improve, yet in many cases a far from satisfactory standard still obtains.<sup>20</sup> In my experience, less than 25 % of the accidents met with are due to lack of localised guarding, and it seems to me to be very necessary to find a more efficient method of eliminating those due to other causes. Within my experience, accidents may be broadly grouped as follows (in what I consider their order of importance):—

- (1) Those due to lack of experience, changing operations, etc.
- (2) Those due to lack of co-ordination or understanding between fellow employees.
- (3) Those due to what is usually termed 'carelessness' or 'lack of caution.'
- (4) Those due to localised guarding.
- (5) Those due to unexpected causes, or conditions beyond the control of the injured person, such as explosions, etc.

<sup>18</sup> Mr. Inspector Armstrong. <sup>19</sup> Mr. Inspector Clark. <sup>20</sup> Mr. Inspector Middlemiss. All three quotations are from the 1923 Report by the Dept. of Labor and Industry on the working of the Factories and Shops Act.

- (6) Those due to abnormal physical conditions of the injured person.

I am strongly of opinion that the most effective means to lessen factory accidents is through educational publicity methods, directed to both employer and employee."

#### MAKING THE STEEL WORKS "FOOL PROOF."

The largest employing concern in the district has shown a commendable example in the thoroughness of its application of the latest safety devices, and compares very favourably with similar American enterprises. The number of accidents occurring at the Steel Works every year is still large (compensation was paid, it will be remembered, for 521 cases in 1923), but it can safely be inferred that without its vigorous policy and practice of "safety first," the number would be far greater. It has been the experience of the United States Steel Corporation, which inaugurated its accident-prevention campaign in 1906, to secure a reduction of accidents by 43 % (or, say, a total of 11,074 cases) in seven years.

It will be further instructive to describe some of the provisions which the B.H.P. has made.<sup>21</sup> In its yards, which are criss-crossed by 29 miles of wide and narrow rail tracks, danger-warning signs are found wherever foot or vehicle tracks intersect the lines. One recent device for safety against switchmen being pulled on to the track, or falling across it, is the switch lever, parallel to instead of at right angles to the line. Both kinds are in use at the Steel Works, some, in addition, being hand-railed. The Company has not yet, however, inserted the American device of wood and steel blocks in the "frogs," i.e., in the acute angles formed by rails crossing one another. Hand-rails are placed around pits and yard winches, and are painted white for detection at night. There is the further provision of railed bridge runways, covers for the wheels of gantry and engine cranes, and automatic couplings on molten metal trucks, cinder ladles, and mould trucks for the avoidance by men of unnecessary proximity to the intensely hot metal. In the most up-to-date American plants a reinforced concrete wall encloses the "skull-cracker"—the yard where the "skulls" of cooled

21. The facts were gathered by personal observation, the management replying to my questionnaire that "in the absence of the necessary data, it is not possible to supply you with the information sought."

metal formed within the ladles are broken up by the falling of a heavy iron ball. Fragments of the metal are liable to fly in all directions. No such wall has yet been placed around the "skull-crackers" at Port Waratah, although pieces of flying "scrap" have been known to pierce adjoining galvanised iron buildings.

A modern blast furnace is made up of three primary divisions—(1) the blowing engines, (2) the stoves, and (3) the furnace proper, or stack. Carefully proportioned quantities of coke fuel, chemical flux, and ore are poured into the stack by a mechanical filler. In older types of furnace the feeding had to be done by manual labor, and was exceedingly dangerous should a "hang" of the caking material and consequent ejaculation by exploding gases take place. The furnace plant at the B.H.P. is of the latest type, which embodies in its design the elimination of unnecessary risks to life and limb. Likewise in the "cast house," where the molten iron is tapped from the furnace, the substitution of the "iron notch" (the tap for the molten metal), which bores by means of compressed air instead of muscle, and of the automatic "mud-gun" for claying up the "iron notch," has saved men from serious burns by splashing iron. The same sort of safety provision is found in all departments of the works, and a special staff is employed to maintain them in adequacy, and to secure the co-operation of the employed force.<sup>22</sup>

Other large works throughout the district have adopted a similar policy of "safety first"—a slogan most insistently heard (perhaps too insistently for the perpetual freshness of its appeal) in the works of the Railway Department.

#### MAKING COAL MINING SAFE.

The dangers of mining are perhaps even more unavoidably recurrent than those of manufacture. This will be realised when it is seen that during the years of the decade 1913-1923, despite the relatively safer conditions for mining in the Hunter River Valley than in American and British mines, the number of accidents each year was, in order, 103, 116, 98, 14, 83, 74, 81, 77,

<sup>22</sup>. During the six months ending Oct., 1925, the B.H.P. spent £11,000 on safety devices, and established a record in accident reduction, only 45 accidents, or 2 per cent. per annum, on a basis of 1500 employees, having occurred during that period—evidence of the undoubted value of rendering industry as "fool-proof" as possible.

60 and 108, and the number proving fatal 14, 11, 17, 8, 14, 7, 11, 13, 12, 7 and 29; that is, not one year passed without at least seven fatalities!

In his report on the Bellbird disaster, the Chief Inspector of Mines gave it as his opinion that, in the total absence of evidence to the contrary, the fire was probably caused by a naked light in some way. At the enquiry the question of lighting was brought up, and much evidence given that naked lights should be prohibited on the South Maitland field. Much also was said about rescue work and rescue apparatus. The jury's recommendation that a central rescue station, with a trained staff, be forthwith established, equipped with the most modern appliances known, was largely responsible for the introduction, late in 1925, of a Bill requiring owners to organise and maintain in every mine competent rescue brigades. The jury further expressed the opinion that the Coal Mines Regulation Act of 1901 was obsolete, in that the Act did not enforce sufficient precautionary measures for the protection of underground employees. Following on agitation among the miners for a Royal Commission of Enquiry into the safe-working of mines, the Nationalist Government, while declining to appoint such a Commission, introduced their Bill in 1924 requiring of owners the provision, *inter alia*, of relief stations throughout the mines. Upon the advent of the Labor Government this became law in September, 1925, as the Mines Rescue Act. In addition to bearing the cost of equipping, maintaining and controlling rescue stations and rescue corps, including the training of men in the use of rescue apparatus, the proprietors are required to contribute to Mines Rescue Funds. At the same date the Coal Mines Regulation Act was amended with respect to persons without experience working at the face of the coal in a mine. But this legislation did not satisfy the agitation for safe working in the mines. The Government, therefore, installed a Royal Commission of enquiry. After lengthy and exhaustive taking of much conflicting evidence, especially upon the vexed question of the value of safety lamps, the Commission's report was placed before Parliament in September, 1926, and in the following month a Bill—the Coal Mines Regulation (Amendment) Bill, 1926—was introduced by the Minister for Labor and Industry.<sup>23</sup>

The Bill provides for what is at once both a stricter

and more elastic administration of mines inspection, and for new rules for ventilation, the use and examination of safety lamps, the prohibition of internal combustion engines underground, regulation of shot-firing, and the size deputies' and shot-firers' districts, the prevention of coal dust (by cleaning of floors, roof and sides of underground roads), and the provision of sanitary conveniences and bath and change-house accommodation at mines and coke-works. The Bill also aims to ensure greater competency among mine managers, and prohibits owners or agents of mines taking part in the technical management.

The foregoing will sufficiently indicate ways in which occupations in the mining and manufactural industries provide hazards to physical health. Life on the land subjects the people to far fewer risks from diseases and accident. The tendency to crowding in manufacturing centres itself is a provocation to physical disability. Overcrowding in Newcastle and suburbs has been a bad social feature since the influx of manual workers to iron and steel employments set in. There are to-day not enough houses for the people. Amongst the 16,912 occupied dwellings at the time of the 1921 census, some 747 were flats and tenements, and of the 20,090 occupied dwellings at the end of 1925 probably a much greater proportion were flats. In addition, the city carries a large boarding-house population—not all living in what are to be described as boarding-houses. Unfortunately for the healthiest condition of the people, most of the residential suburbs, as well as the industrial areas, have been built upon flat, and in some places swampy, ground, at the entrance to the Hunter—to the neglect, because of an inadequate policy of cheap transit facilities, of the surrounding ring of health-guaranteeing hill country. The overcrowding is making the extension of such facilities very urgent.

#### D.—INFLUENCE OF OCCUPATION ON HABITS AND OUTLOOK.

As a conclusion to our whole enquiry, we may ask if any direct relationship is apparent between the behaviour, habits and outlook of the people and their work. Any answer must necessarily be purely personal opinion, for we are now out of the field of statistical measurement.



It would seem that some relation can be traced between the various types of rural pursuit and the types of people engaged therein, though this connection must not be pushed too far because of numerous little-understood factors, both biological and psychological, which supervene. It is generally conceded, however, that the people engaged in pastoral activity as a whole are more open-handed, as they are open-hearted, than primary producers confined to the dairy farm or the agricultural plot. Expansiveness of outlook has some connection with the expansiveness of the sheep or stock run. Subject to the risk of dangerous generalisation,<sup>24</sup> we may say that the dairy farmer and the agriculturist is, in each case, apt to be a man of narrowed interests, suspicious, tight-fisted, unscientific, and conservative. These qualities are accentuated when he happens to have lacked education and yet to have succeeded, because lucky enough to get into possession of a block of Ricardo's "land of the first quality." Such is a type to be found on the rich lucerne-growing flats along the banks of the Hunter. They are distinctly hostile to new ideas in agriculture or the assumption that agricultural science can have little to teach "practical" men who have succeeded. The older farmers have succeeded more through rises in land values due to the growth of local markets in industrial Newcastle and the mining towns, but delude themselves into the belief that it is because of good methods of farming. The newer generation, to whom better education is giving a different outlook, are anxious to get up-to-date.

The degree to which inter-marriage has gone on during three or four generations in some rural districts is undoubtedly a cause of lowered mental efficiency — a biological tendency initiated by the economic requirement which ties men to the land and to a locality.

The farmers are notoriously independent of one another. In contrast to their individualism is the craft consciousness and unity of the miners. Probably the separation into scattered holdings accounts largely for the weak sense of solidarity among farmers, as living together in communities, with a single main interest, strengthens it among the mining population. Miners as a whole exhibit a consciousness of craft and class, which comes little short of hostility to those in other callings.

<sup>24</sup> And of being charged with ungenerous judgment—a charge which, in view of personal friendship with many individual exceptions to these class descriptions, the Author is at pains to avoid.

And the smaller the mining community, provided it is sufficiently isolated from other centres, the stronger this feeling. Again it is as dangerous as it may be unfair to indulge in rash generalisation. Yet the truculence which many show when they believe they are exercising a commendable independence, the disregard of others' rights, and the little scruple with which some will, for instance, raid the fruit and vegetable crops of the farmers,<sup>25</sup> the irresponsibility of the younger men in their attitude to the elder men and to authority generally—these are symptoms of occupational characteristic, even though they are the practices of minorities. It is certain that Dr. Dunmore Lang's description of the Newcastle miners as he saw them in 1875 as a "quiet, orderly, church-going people" would not be perfectly apt to-day. That same interesting chronicler, with his Victorian class assumptions, commented on the colliers' ownership of their comfortable cottage homes, and on the surprising fact that "some of them even have riding horses." He would find equating those facts to-day a very large proportion of well furnished dwellings owned by the miners, especially on the Maitland field, and not a few the possessors of their own motor cycles and cars.

If farming as an occupation makes for individuality, mining, with its widespread organisation controlling the action of individuals, seems to make for weakening of individual initiative. The individual miners, in matters appertaining to their work, are never free from consciousness of the strength and weight of the crowd. Hence the miner does not tend to develop a strong *moral* initiative of his own. This is proved repeatedly in the mass decisions taken, which are not a reflex of aggregate honest individual opinion.

Amongst workers in manufacture and transport, there is certainly a stronger sectional cohesion than found among farmers, but nothing equivalent to that of the miners. This is easily understood when it is remembered that the population employed in such occupations is much more given to movement than either farmers or miners. The demand for artisan and laboring work is not confined to one centre. Cohesion amongst artisans and laborers in their social life is not strong, for in Newcastle, though many may work together in the one workshop, they live scattered amongst people of various other

<sup>25</sup>. Some of the younger vine-growers near Cessnock are equally anti-social in their proclivities.

occupations in the suburbs. Thus, unlike the miners, they do not develop a sense of strong common economic interests. This accounts for the small interest in union affairs, as it also helps to destroy fixed interest in other matters of common concern. Strong staying power is not a feature of the Newcastle industrial population in any kind of organised activity—even in its organised sporting life. A strong disintegrating force is the widespread social habit of gambling, which is an unquestioned obstacle to the development of the healthiest social activities.<sup>26</sup>

Amongst people who are not of the wage-earning classes—people in commercial and professional pursuits, or who are the enterprisers in mining and manufacture—there is, as a whole, a remarkable absence of corporate outlook. It is by such classes in most cities of a size comparable with Newcastle or Maitland that corporate community life is organised and led. But in Newcastle and Maitland there is an astonishing absence of such strong corporate activity. Few of those in the more comfortable classes think or act in terms of the city as a whole. This is to be accounted for, in Newcastle, by a consciousness of the older residents that they are numerically far outnumbered by a new industrial population, with whom they have not become assimilated, partly by the proximity of Sydney, which offers many already organised pleasurable interests for their spare time, and partly by the absence of a traditional culture which must express itself in social service.<sup>27</sup>

### CONCLUSION.

The foregoing offers no more than an outline introduction to the study of one of the most important industrial districts of the Commonwealth. If to the student of economics too much space will seem to have been devoted to the mere description of industrial activity, the writer can only advance the excuse that no useful generalisations could have been reached by himself without such factual knowledge, and that he assumes that his reader would have been similarly handicapped. If to

26. It is largely productive, for instance, of the paralysing indifference with which the Workers' Educational Association and other movements have to contend.

27. This is not to minimise the splendid community service of a few rare spirits among the body of citizens, of whom the late William Scott was a notable example, nor to derogate from the efficient provision of civic services.

the general reader, or to the reader expert in any special corner of the multiplex activities described, the writer's comments or conclusions seem rash or too unqualified, excuse, if such be demanded, must be craved on the ground that a certain presumptuousness is the prerogative on one who attempts any kind of conspectus of community life. It is hoped that what has been written above may serve to provoke someone better qualified to undertake a more thorough and exhaustive survey of the socio-economic life of the region.

The people of the Hunter River Valley as a whole have a wonderful natural heritage of the material resources which are of value in economic welfare. But conscious co-operation for its efficient development and equitable distribution has as yet gone but a short distance. Interests are still too strongly sectionalised to allow of the production of the maximum good for all. After all, the way to the economic summum bonum for the region, as for any community in our highly evolved present-day civilisation, is not by pushing the quarrel of the interests as a test to justify possession. The study of the inter-relatedness of life in even such a small territory as the Hunter River Valley suggests that one way of achieving the desired end is by creating a widespread recognition of the one-ness of all economic activity, and of the possibility of so organising its direction (if men will but forsake their beloved selfishness, prejudices, hostilities, and follies) that the abundance beneath and about them may be transformed into enough of the means to the good life for all.

*"The essence of production,"* says Charles Gide, *"is not the creation of matter, but simply the accretion of value."* He is the truest leader and the most faithful public servant who will teach the people the economics of the *highest* values, which are not primarily economic at all, but moral and spiritual.

# INDEX

## A

Abattoirs, 86, 100.  
 Aberdare, 59, 60n, 66.  
 Aberdare Extended Colliery, 18.  
 Aberdeen, 162n; Chilling and Freezing Works, 41, 130.  
 Abermain, 59, 66.  
 Abermain Seaham Collieries Ltd., 59, 84.  
 Accidents in Industry, 187-193.  
 Agricultural Bureaux, 163.  
 Allyn River, 1, 7, 15.  
 Amalgamated Engineering Union, 104, 105, 127.  
 Ammonium Sulphate, 90-92.  
 Apprenticeship, 129.  
 Arbitration, 77-79, 123.  
 Associations; Economic Defence, 155-177.  
 Australian Agricultural Co., 45, 57-59.  
 Ayrfield Coal Co., 59, 84.

## B

Baddeley, J. M., 192.  
 Barrington Tableland, 2.  
 Beeby, Judge, 128.  
 Bees, 45.  
 Belford Dome, 15, 27, 28.  
 Bellbird, 59; Disaster, 188, 192.  
 Benzol, 90, 92, 93.  
 Bethlehem Steel Corp., 121n.  
 Beveridge, Sir Wm., 103.  
 Blue Metal Quarries, 100.  
 Boilermakers, 126, 128.  
 Boolaroo, 164.  
 Borehole Coal, 12, 16-18, 20n, 21, 29, 30, 63.  
 Bounties, 113, 114, 118.  
 Branxton, 46, 136, 160, 161, 185.  
 Branxton Gap, 3, 4.  
 Bricks, Building and Furnace, 99, 100.  
 Broken Hill Proprietary Co. Ltd., 16, 66, 69n, 86-93; Closing of Steel Works, 107-109; Labor Turnover, 121; "Safety First" Provisions, 190, 191; Ships, 149, 150; Workers' Compensation, 187.  
 B.H.P. Collieries Pty. Ltd., 101.  
 B.H.P. By-Products Pty. Ltd., 92.  
 Brown, J. & A., 57-59, 144, 149; John, 76.  
 Burwood Coal, 16.  
 Butter, 40-42, 49, 51, 144, 161, 162, 164.  
 By-Products (see Steel).

## C

Caledonian Collieries Ltd., 59, 60.  
 Cambage, R. H., 15n, 16n, 19n, 22, 24n, 25, 30.  
 Carrington, 145, 146.  
 Carrington Coal Trimmers, 147-149.  
 Cash-and-Carry Stores, 166-168.  
 Cassilis, 32, 39, 40.  
 Cattle, 40-42, 45.  
 Cement, 99.  
 Casual Work, Economics of, 147, 148.  
 Central Greta Coal Co., 59, 84.  
 Cessnock, 22, 44, 51, 54, 59, 66, 160, 164; Population Growth, 180-182.  
 Chichester, 1, 7.  
 Clarence Town, 8, 50.  
 Clay Pits, 99, 100.  
 Class-Consciousness, in Mining, 75, 80.  
 Climates of H.R.V., 32.  
 Coal, 1-30; Chinese, 36, 37; Costs, 69-72; Earnings in Industry, 69, 71; Distribution, 21, 23; European and American, 34-36; Exports, 36, 67-69; Markets, 35, 36; Measures, 10-15; Output Ton-nages, 60, 61; Prices, 68, 69; Qualities, 15-18, 29-30; Quantities, 18-24; Shipment, 144-150; Value, 21, 71.  
 Coal Mining, 57-84; Business Problem, 67, 73; Engineering Problem, 62, 67; History, 57-60; Nationalisation of Mines, 79; Socio-Economic Problem, 74-82.  
 Coal Tribunal, 77.  
 Coal Trimmers, 147, 148.  
 Cockle Creek, 97-99, 101.  
 Coke, 16, 17, 66, 67, 90, 100.  
 Collieries, 58-60, 83, 84.  
 Commerce, 134-152.  
 Commercial Community, 151, 194.  
 Competition; H.R. ver. North Coast Butter, 162; Manufacturing, Problem of, 111-119, 151; Rail ver. Sea, 120; Sydney ver. Newcastle, 134, 139-144.  
 Co-operation, Community Settlement, and Credit Act, 1923, 40n, 42n, 160n.  
 Co-operative Movement, Consumers', 164-169; Immigrant Element, 165, 169; Price Problem, 166-168; Wholesale Society, 161, 168, 169.  
 Co-operative Movement, Producers', 160-164; Producers' Distributing Society, 161.  
 Cotton, 42-44; Ginnery, 100.

## D

Dairy Farmers' Co-operative Milk Supply Ltd., 161n.  
 Darg, 78.  
 David, Prof. Sir T. W. E., 9, 13n, 20n, 21, 22, 25n, 58  
 De-Casualisation, 147-149.  
 Decline—of Industries, 42, 44-46, 50-54; of Overseas Coal Trade, 67-70, 72-74.  
 Denman, 40, 160, 164.  
 Disputes, in Mining, 60, 76, 145, 146, 148, 149.  
 Diminishing Returns, 53, 63.  
 Division of Labor—in Coal Industry, 69, 71; in Steel Industry, 87-91; Territorial, 112.  
 Dora Creek, 162.  
 Dudley Coal Mining Co., 83.  
 Dumping, 112-114.  
 Dungog, 50, 51, 160, 182.

## E

East Greta Coal Mining Co., 53, 84.  
 Economic Rent, in Mining, 71, 72.  
 Electricity Supply, 185.  
 Engineering, Mining, 62-66.  
 Engineering Works, 96, 97.  
 Enterprises, in Mining and Manufacture, 151, 166; Organisations, 156-160.

## F

Factors of Production, 61.  
 Factories and Shops Act, 1912-1915, 187.  
 Farley, 11.  
 Farmers, 118, 194.  
 Fertilisers, 53, 92, 98.  
 Floods, 8, 33, 50, 53.  
 Flour, 86, 101n.  
 Forty-four Hour Week, 123, 124.

## G

Galvanised Products, 93-95, 113-118.  
 Gas and Coke, Newcastle Co., 100.  
 Gambling, 196.  
 Geography, 31-37.  
 Geological Survey—N.S.W., 24, 28; U.S.A., 19  
 Geology, 7-30  
 Gide, Prof. C., 197.  
 Griffith-Taylor, Prof., 2n.  
 Gravel Quarries, 100.  
 Greta, 11, 15, 164, 182, 185.  
 Greta Coals, 29, 30.  
 Greta Main Coal Co., 59, 84.  
 Greta Coal Measures, 13, 14, 17, 60. (See South Maitland Field).  
 Goitre, 186.

Goninan, A., & Co., 93n.  
 Gresford, 50.  
 Grocers' Retail Association, 160.  
 Goulburn Valley District, 39, 40.

## H

Hazards in Industry, 130, 185-193.  
 Hebburn, 66.  
 Hebburn Ltd., 59, 84.  
 Hetton-Bellbird Collieries, 59, 84.  
 Hexham, 160, 161.  
 Higgins, Judge, 106, 107.  
 Hoare, T., 77n, 78n.  
 Holidays, 124-125.  
 Hunter River, 1, 2.

## I

Ice Age, 9.  
 Industrial Fluctuation, 102-111.  
 Industries Preservation Act, 113.  
 Iron (see also Steel)—Galvanised, 94, 95; Importance of, 89; Manufacture of, 87, 88; Ore, 87; Slag, 92; "Scrap," 6.  
 Iron Knob, 87.  
 Isohyetal, 25-inch, 4.

## K

Kerosene Shale, 14, 15.  
 Kirton & Earnshaw Ltd., New Greta, 59, 84.  
 Kurri Kurri, 59, 164, 166, 182.

## L

Labor and Industry Dept., 106, 187-189.  
 Labor Problems — in Manufacture, 119-131; in Mining, 74-81.  
 Labor Turnover, 120-122.  
 Lake Macquarie, 67, 151, 152.  
 Lang, Dr. J. Dunmore, 49, 50, 85, 195.  
 Local Government, Problems, 182-185; Public Utility Enterprises, 100, 185.  
 Localisation of Industry, 85, 86, 93.  
 Loder Dome, 27, 28.  
 Lower Hunter, 1, 5, 48, 49.  
 Lucerne and Fodders, 42, 45, 49.  
 Lysaght's Newcastle Works Ltd., 91, 94, 115, 117, 118, 121.

## M

Maciver, R. M., 155.  
 Maitland, East and West, 3, 7, 33, 44-46, 99, 164, 181, 196; Coal, 17, 22; (South) Field, 58-61, 63, 64, 180, 181, 192.  
 Management Problems, 71, 120-122.  
 Manufacturing Industry, 85-133; Competition, 111-119; Labor, 119-131; Problems of Industrial Fluctuation, 102-111; Workers in, 195.

- Manufactures, N.S.W. Chamber of, 160.
- Marketing, Producers', Co-operative, 162-164.
- Markets—B.H.P. Products, 91-93; Butter, 51, 144; Cement, 99; Cessnock, 44; Coal, 35-37, 67-74; Cotton, 43; Galvanised Products, 94; Maitland, 44, 45; Milk, 45, 46, 49, 51; Poultry, 48; Steel Tyres and Axles, 96; Vegetables, 45; Welsh Island Products, 96, 97; Wine, 46, 47.
- Martin's Creek: Blue Metal Quarries, 100.
- Marxism, 76, 80.
- McMyler Holst, 138n, 145.
- Merriwa, 39-41, 134, 135.
- Metal Trades' Association, 160.
- Millots, 45.
- Mid-Hunter, 1, 2, 44, 48.
- Miners' Federation (Mining Dept., W.I.U. of A.), 69n, 76; Organisation, 169-174; Outstanding Grievances, 77-81.
- Mining: Coal Mines Regulation Act, 1925, 187, 192; Amendment Bill, 1926, 192, 193; Communities, 194, 195; Hazards, 186, 188, 191-193; Population, 75, 76.
- Mines Department, N.S.W., 18n, 24n, 27, 185.
- Mines Rescue Act, 1925, 192.
- Mitchell, J., 14n.
- Morpeth, 33, 160.
- Murrurundi, 10, 41, 182.
- Mt. Royal Range, 1, 7.
- Muswellbrook, 160, 161, 164n, 182, 185; Coal, 21-23, 60n.
- Muswellbrook-Aberdeen Area, 41.
- N**
- Nationalisation of Mining Industry, 79.
- Neath, 59.
- Newcastle, 21, 85, 135, 136, 196; as Butter and Egg Exporting Port, 144; Chamber of Commerce, 137, 139-143, 156, 157; City Council, 180n, 182n, 183n; Economic Growth, 180; Exports and Imports, 143, 180; Greater Newcastle Proposals, 182, 185; Overcrowding Tendency, 193; Population Composition, 180, 181; Port Facilities, 135, 142-150; Port Problems, 139-151.
- Newcastle Coal Measures, 14-13, 17, 60.
- Newcastle Coal Mining Co., 59, 83, 84, 185.
- Newcastle-Wallsend Coal Mining Co., 83.
- Nile, 31, 32.
- Northern Collieries Assn., 78, 157.
- N.S.W. Geological Survey, 24, 28.
- Occupation; and Habits and Outlook, 193-196; and Health Hazards, 185-193; and Population Distribution, 180-181.
- Oil, 18, 24, 25, 27-29.
- Operatives; Problems in Manufactures, 122-131; Problems in Mining, 74-81; Organisation Problems, 169-177.
- Orcharding, 42, 45, 50, 52, 53.
- Overtime, 124, 125.
- P**
- Pastoralists, 194.
- Paterson, 8.
- Paterson River, 1, 4, 7, 49-51.
- Paton, J., Brig.-Gen., 141n, 145n.
- Patrick Steamship Co., 147, 149, 151.
- Permo-Carboniferous, 9, 10, 11.
- Petroleum, 15.
- Piece-Work, 69n, 126-128.
- Pigou, Prof., 115.
- Pokolbin Vinegrowers' Assn., 157n.
- Population; Distribution of, 180-182; and Local Government, 182-185; South Maitland Coal Field, 59, 60.
- Port Stephens District, 54, 55.
- Poultry Breeding, 48.
- Port Waratah, 86, 136.
- Powers, Judge, 108.
- Prices: "Cash and Carry," 167, 168; Coal, 68, 69; Co-operative, 166, 167.
- Primary Industries, 32-56.
- Primary Producers, 194; and Railway Freight Rates, 116, 117; Union, 157, 164.
- Printeries, 100.
- Printers, Master, Assn., 160.
- Producers' Distributing Society Ltd., 161-163.
- Professional Community, 196.
- Protective Duties, 112-116.
- Purified Coal and Coke Co., 16, 66.
- R**
- Rabbits, 41, 118.
- Railways: Coal Haulage, 136-138, 145-147; Discriminating Rates, 139-141; Freight Rates, 116, 117; Royal Commission, 1924, 116, 117, 139-142; Private Lines, 134-135; Private Rolling Stock, 136-138; Proposed Extensions, 134-136; Tapering Rates, 141-143.
- Rainfall in H.R. Valley, 3-6, 32, 39, 40.
- Raymond Terrace, 7, 46, 48, 49; Dairy and Produce Co., 49, 161.
- Redhead Collieries Ltd., 83.
- Rix's Creek Coal Field, 23.

Reid, Mark, 141n, 151n.  
 Rochdale Co-operative Societies, 154-156.  
 Rollin, Judge, 107.  
 Rothbury Estate, 59, 84.  
 Rylands Bros. (Aust.) Ltd., 91, 93, 94, 113, 118n, 121.

S

"Safety First," 130, 189-193.  
 Sargent, Prof., 18, 20.  
 Scoone, 40, 41, 160, 164n, 182.  
 Scottish-Australian Coal Mining Co., 83.  
 Sedgefield Dome, 27, 28.  
 Sheep, 40, 45.  
 Shift-Work, 125.  
 Ship-Building, 96, 97.  
 Shipping; Freight Rates, 117, 118, 151; Management Problems, 150; Port Hunter, 149, 150.  
 Shortland, J., Lieut., 87.  
 Singleton, 3, 11, 13, 27-29, 42, 53, 160, 161, 164, 181, 182.  
 Smelters, 98.  
 Smith, Elliot, Prof., 31.  
 Soap, 86, 101n.  
 Social Life, 194-196.  
 Soils, 7, 8, 39, 40, 43, 46, 48, 50-55.  
 Steel; By-products, 91-93; Manufacture, 86-92; Markets, 91-93; Products, 93-97; "Scrap," Importance of, 89; Tyres and Axles, 95, 96.  
 Steel Works, Conciliation Committee, 108.  
 Stevedores', Port Hunter, Assn., 147, 148, 160.  
 Stockton Borehole Collieries, 83.  
 Strikes, 60, 76, 166.  
 Sulphide Corporation, 93n, 97-99, 122, 130.  
 Sulphur and Superphosphates, 97-99.  
 Sussmiltch, C. A., 3n, 5n, 7n, 8n, 13n, 48n.

T

Tar; for Road Surfaces, 92.  
 Tar Derivatives, 90-92.  
 Tariff Board, 113, 114, 117n.  
 Thornton; Firebricks, 99;  
 Timber, 51, 54.  
 Tiles and Pipes, 99.  
 Time Lag, 103, 106.  
 Tomago Coal Measures, 13, 14, 17, 23, 60.  
 Topography, 1-6.  
 Trade Unions; A.W.U., 108; Blacksmiths, 127-129; Boiler-makers, 126-129, 173, 174; Coal and Coke Shippers, 127, 172; Coal Trimmers, 147-149; Engine-drivers and Firemen, 125; Engineers, 104, 105, 107, 125-127, 173-176; Iron-

workers, 108, 177; Miners, 76-81, 170-172; Printers, 124-127; Other Unions, 124n-127n, 171, 172, 176, 177; Friendly Benefits, 173-174; Functions of, 171, 176; Organisation, Problems of, 170, 171, 176, 177.

Transport, 34, 134-152; Coal, 136, 139; Economics of, 139-143; Motor Vehicles, 152; Railways (see) Riverways and Roads, 151, 152; Shipping, 149-151; Workers in, 195, 196.

Trucks; Privately Owned, 136.

U

Unemployment, 103-107, 109; Insurance Against, 111n; Union Alleviation of, 172-174.  
 Upper Hunter, 1, 2, 40-44.  
 U.S. Bureau of Mines, 188.  
 U.S. Geological Survey, 19.  
 U.S. Steel Corporation, 190.

V

Value of Service Principle, 143.  
 Vegetables, 45, 53, 55.  
 Vickers-Commonwealth Steel Products Ltd., 93n, 95, 96, 117.  
 Victimisation, 130.  
 "Victimised" Pay, 78.  
 Vineyards, 42, 46-48, 50, 52.

W

Wages, 125-128; and "Cash-and-Carry" Prices, 167; Plasticity, 111n.  
 Wallarah Coal Co., 83.  
 Wallsend, 164, 185.  
 Walsh Island, 91, 93n.  
 Waratah; Fire and Building Bricks, 99.  
 Waste; in Coal Mining, 62-66; in Coke Manufacture, 66, 67.  
 Water Supply and Sewerage, 184, 186.  
 Watson, J. T., 21, 62-66.  
 Welfare Schemes, 130.  
 West Greta Coal Co., 59, 84.  
 Weston, 59.  
 West Wallsend, 164, 165, 185.  
 Wheat, 7, 39, 44, 45.  
 Wickham and Bullock Island Collieries Ltd., 59, 84.  
 Williams River, 1, 4, 7, 49-51.  
 Wine, 42, 46-48.  
 Wire-Netting (see Galvanised Products), 113, 114.  
 Wire Rope, 85n.  
 Wollombi, 1, 8, 51-54.  
 Workmen's Compensation, 187, 190.  
 Workers' Educational Assn., 196n.

Y

Young Wallsend; Building Bricks, 99.



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**2003-04**