

HOERNLÉ MEMORIAL LECTURE

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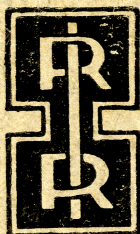
SOME ASPECTS

of the

**SOUTH AFRICAN INDUSTRIAL
REVOLUTION**

by

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HOERNLÉ MEMORIAL LECTURE

A lecture, entitled the Hoernlé Memorial Lecture (in memory of the late Professor R. F. Alfred Hoernlé, President of the Institute from 1934 to 1943), will be delivered once a year under the auspices of the South African Institute of Race Relations. An invitation to deliver the lecture will be extended each year to some person having special knowledge and experience of racial problems in Africa or elsewhere.

It is hoped that the Hoernlé Memorial Lecture will provide a platform for constructive and helpful contributions to thought and action. While the lecturers will be entirely free to express their own views, which may not be those of the Institute as expressed in its formal decisions, it is hoped that lecturers will be guided by the Institute's declaration of policy that "scientific study and research must be allied with the fullest recognition of the human reactions to changing racial situations; that respectful regard must be paid to the traditions and usages of various national, racial and tribal groups which comprise the population; and that due account must be taken of opposing views earnestly held."

Previous Lecturers have been² The Rt. Hon. J. H. Hofmeyr (Christian Principles and Race Problems), Dr. E. G. Malherbe (Race Attitudes and Education), Prof. W. M. Macmillan (Africa Beyond the Union), Sen. Dr. the Hon. E. H. Brookes (We Come of Age), Prof. I. D. MacCrone (Group Conflicts and Race Prejudices), Mrs. A. W. Hoernle (Penal Reform and Race Relations).

SOME ASPECTS OF THE SOUTH AFRICAN INDUSTRIAL REVOLUTION

IT was with surprise and some embarrassment that I received the invitation of your President to deliver the Hoernlé Memorial Lecture for 1951. I felt that somebody else who was in much closer touch with the problems of race relations than I am might well have been asked, and furthermore that my long absence abroad and the subsequent piling up of numerous claimant duties gave me little time to collect my thoughts, if I had any at this stage, in the field which might be covered by a Hoernlé Memorial Lecture. I feel highly honoured, however, in being asked to participate in this illustrious series of Hoernlé Lectures and wish to express my humble thanks and appreciation. I welcome the opportunity of making a modest contribution within the scope of my powers in honour of the memory of Alfred Hoernlé whose stature as philosopher, thinker and scientist grows apace from year to year. His well-balanced and tolerant personality will always be remembered with admiration, while his scientific, factual and rational approach to our racial problems should be an example and guide to us in the future. Because of the very high regard in which we hold Alfred Hoernlé's memory, I feel that any tribute to him should be of the highest scientific merit. It should be a contribution based on long and intimate experience of racial questions with adequate time for preparation and scientific substantiation of facts and figures. Unfortunately my present contribution cannot claim to satisfy all these requirements. My own training and background is that of a chemical and metallurgical engineer, who has had some opportunity during the last twenty-five years of assisting in the industrial development of the country, first with the Electricity Supply Commission, then with the South African Iron and Steel Corporation (IsCOR) since its inception and during its first years of growth, then in private industry on the Rand and during the last ten years in the field of industrial finance. Usually it has fallen to my lot to get things started and moving in a practical manner and in those circumstances there are not the necessary

opportunities for study, writing or lecturing. My contact with general economic and sociological questions has not been wide enough, and I am acutely aware of our limited knowledge and foresight in the assessment of all the important human factors involved in any industrial venture in addition to the purely technological and financial factors which have been my main responsibilities. I shall probably give you more of a personal record of some experiences in the industrial field, which also have some bearing on our racial groups in this country. I hope, too, to give you the basis of some of our thoughts in encouraging further development and some directions that might be followed.

REVOLUTIONARY DEVELOPMENT

Firstly, I think something should be said about the title of this address. It had to be chosen early before I had much time to think of the detail of the address and it therefore had to be sufficiently wide to cover several possible directions in which my thoughts might be inclined to wander. It is meant, however, to describe also a condition in which I think we have found ourselves for quite a number of years and in which we shall find ourselves for many more. The title of the address is also partly a challenge. I have many friends in mining, industry, commerce and agriculture and almost everyone with whom I have been associated during the last twenty-five years has slaved and wrought with little intermission or relaxation in trying to raise the productivity of the country in order to overcome the poverty that still exists among many of its people—a position which, however, is not peculiar to this country. But we still hear on all sides, internally and externally, the criticism that we are complacent, that not enough has been done or that not enough is being done. My strong feeling is that in most of our material developments not much more could have been done than has already been accomplished. We have been passing through a period of revolutionary development with extraordinary success up to the present and had we gone much faster or only a little faster some of the social and human problems emanating from our growth and development would have been much more serious and distressing. It would therefore be valuable in the assessment of our own achievements to endeavour to see them in historical perspective as far as that is possible. The many constructive workers in the economic and social fields may take heart from a stocktaking and be encouraged to further achievement.

When we talk of a society that has passed through an industrial revolution we think of a society that uses machinery to a great extent, conducts its commerce and industry on a relatively large scale and supplies the needs of its simplest members by an organised system of world-wide exchanges. The development of such a society must inevitably be gradual as no nation can pass directly in a short time from a simple and primitive economy to the complicated economy defined briefly above. Some aspects of our modern economy can even be traced to the time of the Crusades, when the Italian cities traded in the rich textiles from Syria ; other features again derive from the first contacts of Europe with the Far East and the New World. In the 18th Century there already was much capital invested in commerce and industry and even some mass production was practised. Many people therefore, bearing in mind the historical background of events leading to change, have argued that the term " industrial revolution " is inappropriate because revolution implies sudden and catastrophic change.

ECONOMIC CHANGES

The remarkable inventions of the 18th and 19th Century, however, played such a dramatic and far-reaching part in changing society that the term " industrial revolution " is not regarded as too drastic a description of the changes they brought about. It is now an established term with a well established meaning and refers particularly to the period in England characterised by the rise of the long wave of economic activity towards the end of the 1780's, its peak around 1800, then a recession with a recovery which ended in the early 1840's. Hard on this period, however, came another such revolution producing a long wave of activity that developed in the 1840's, culminated just before 1857 and ebbed away to 1897. After that another long wave started, culminating in 1911 and subsequently ebbing away. These different changes came as a result of different inventions and different world contacts. The stimulus provided by the older industrial countries in other less developed parts of the world came to a peak in these countries only after some years. Generally, therefore, the term " industrial revolution " means the change that transforms a people with peasant occupations and local markets into an industrial society with world-wide connections. Some reflection will confirm that the changes in South Africa brought about by the discovery of diamonds eighty odd years ago, the discovery of gold little more than sixty

years ago and the rise of secondary industry during the last twenty-five years justify the application of the term revolution to the vast changes that have taken place in this country.

The economy of the Non-European people in South Africa about 80 years ago could certainly not be compared with the peasant occupations and local markets existing in England towards the end of the 18th Century. Here conditions were more primitive. Even the conditions under which the sturdy white South African pioneers lived eighty years ago could not be compared with the stage of development that had already been reached in England say towards the end of the 18th Century. From these relatively primitive conditions we have moved and are moving to a most highly-developed modern industrial economy with unprecedented speed. I know of no place in the world where similar changes are taking place over such a wide area with such speed and so little disorder. Relative to its more primitive starting point the change here appears to be even more revolutionary than the events that took place in the industrial revolution from the 1780's to the 1840's. Let us compare just a few of the features of the English economy of that time with some of ours during recent years.

POPULATION

In 1790 the population of England and Wales was 8,760,000 and for subsequent years the population is given in the following Table, together with the decennial rate of increase per cent.

TABLE 1.
POPULATION OF ENGLAND AND WALES AT THE
DECADES.

Date	Population	Decennial Rate of Increase Per Cent.
1801	8,892,536	14·00
1811	10,164,256	14·00
1821	12,000,236	18·06
1831	13,896,797	15·80
1841	15,914,148	14·27
1851	17,927,609	12·05
1861	20,066,224	11·90
1871	22,712,266	13·21
1881	25,974,439	14·36
1891	29,002,525	11·65
1901	32,527,843	12·17
1911	36,070,492	10·89
1921	37,886,699	5·03
1931	39,947,931	5·4

The total population of the Union in 1946 was 11,418,349 which represented a decennial rate of increase of 19% over the 1936 figure of 9,589,898. During this year of 1951 therefore, the total population of the Union may be approximately 12½ million, which compares with the population of England and Wales in about 1823, right in the middle of the period known as the Industrial Revolution. The rate of growth of population here in the Union compares with some of the highest figures in England during that period.

PRODUCTION FIGURES

The following Tables give some indication of the production of coal, pig-iron and steel in Great Britain during those periods as well as the approximate production of pig-iron in the world.

TABLE 2.
OUTPUT OF COAL IN GREAT BRITAIN.

Year				Million Tons
1750	...	...	...	9
1800	...	...	...	11
1816	...	...	...	28
1839	...	...	...	31
1845	...	...	...	35
1860	...	...	...	75
1870	...	...	...	105
1880	...	...	...	135
1891	...	...	...	180
1900	...	...	...	220
1904	...	...	...	240

TABLE 3.
OUTPUT OF PIG-IRON IN GREAT BRITAIN.

Year				Output Tons
1720	...	...	...	25,000
1788	...	...	...	68,300
1840	...	...	...	1,396,000
1850	...	...	...	2,250,000
1860	...	...	...	3,890,000
1870	...	...	...	5,960,000
1880	...	...	...	7,780,000
1890	...	...	...	7,900,000
1900	...	...	...	8,960,000
1910	...	...	...	10,010,000

TABLE 4.
WORLD OUTPUT OF PIG-IRON.

Year				Output Tons
1820	...	...	...	1,000,000
1830	...	...	...	1,800,000
1840	...	...	...	2,700,000
1850	...	...	...	4,700,000
1860	...	...	...	7,222,000
1880	...	...	...	18,160,000
1890	...	...	...	26,750,000
1900	...	...	...	39,810,000
1910	...	...	...	64,760,000

TABLE 5.
OUTPUT OF STEEL IN GREAT BRITAIN.

Year				Output Tons
1870	...	...	...	220,000
1880	...	...	...	1,290,000
1890	...	...	...	3,580,000
1900	...	...	...	4,900,000
1910	...	...	...	6,370,000

OUR OWN COAL PRODUCTION

While it is not my intention to burden you with too many figures or to labour these comparisons too much, it is nevertheless of great interest to know that our own coal production in 1950 was of the order of $28\frac{1}{2}$ million short tons or 50% more than in 1940. This production figure compares approximately with British coal output round about 1815. I make so bold as to prophesy, however, that in the next ten years the increase in coal production in South Africa will be greater than the increase in coal production in Great Britain during the thirty years from 1815 to 1845 and I emphasize this point because it is to a certain extent a comparative measure of the adjustments we may have to face during the next ten to twenty years in **our** industrial revolution.

The industrial revolution came first in England because of the skill of her people, her favourable political institutions, her climatic and geographical advantages, internal free trade and great experience of foreign trading, special connections with India and the New World and an abundance of coal. In the beginning of the industrial revolution coal did not matter

as much as later on because the first revolutionary inventions in the textile industries were worked with water power. One therefore reads that at this stage France, because of her water power, also made great strides as an industrial nation even before the French revolution, but when the inventions of Watt and others made coal the chief source of cheap power, France was at a disadvantage vis-a-vis England. The use of coal enabled the textile industry to become independent of water power and gave it a greater choice of location. Industry could be brought to the people or could be dispersed with greater ease. So also iron production was dependent on charcoal and woodlands mainly available in the Southern counties. With the discovery of the use of coal and coke in iron production, the iron industry shifted to the black country and developed at a great rate. Our South African coal is readily accessible in very wide seams and has greatly assisted our remarkable expansion during the last fifty or sixty years. Coal is still the basis of our confidence in the future of industry in South Africa and will be the outstanding instrument for building up the standard of living of the peoples of the Union as it was in England during the industrial revolution.

PIG IRON

Pig-iron production in the Union today is at the rate of approximately one million tons per annum and is likely to increase to a rate of $1\frac{1}{4}$ million within the year. This production once again compares with the production reached in Britain towards the end of the industrial revolution. Twenty years ago South African pig-iron production had not yet reached 50,000 tons per annum. A study of these Tables will no doubt lead you into other interesting comparisons of growth, but I must pass on. Let these figures, however, give substance to our vision of what South Africa may be twenty or fifty years hence.

TEXTILES

The textile revolution of course played a very important part in England during the period referred to and as yet we have no textile production figures to compare say with the 300,000,000 pounds of cotton imported by England in 1883. In 1764 she imported only 4,000,000 lbs. of cotton. On the other hand, our gold-mining activity may be regarded as having been of similar dynamic effect in South Africa as textile development in England during the industrial revolution.

ELECTRICITY

At the end of the 19th Century electricity was discovered and a new era developed. We cannot as yet assess all the consequences of this development. This new power, which also has the merit of being cheap, has already played a far-reaching part in South Africa, but I would refer to just one aspect, namely, the possibilities of greater decentralisation and dispersal of industry which must be of the greatest importance to South Africa and its people. The factory system developed first round water power, the location of which was fixed. Spinners and weavers, for instance, came from their home industries to the factories where the power was concentrated. The advent of steam power gave greater flexibility and mobility to factory siting, but the type of factory remained the same, as it was still dictated by, and built around, a large and expensive power unit. With the advent of electricity which can be transmitted by wire, the small power unit has been brought right into the home in the way well known to us. Let us, therefore, not lose sight of the possibilities of the small factory in outlying areas which is now a more feasible proposition with its small electric motors than in the period of the bulky steam engine. The internal combustion engine has already played its revolutionary part in South Africa in the field of road motor transport. It will most certainly play an increasingly important role in the field of agriculture and as a source of power where electricity cannot yet be brought economically. Unfortunately, we have no oil in South Africa, but it would appear that our cheap coal in the interior may also provide a source of this important fuel on an economic basis while in addition an alternative form of cheap energy transport may be provided by large diameter coal gas pipe lines to the large centres of consumption, instead of increasing the transport by rail of relatively low-grade coal.

FRANCE

I mentioned France earlier, and it may be worthwhile to refer shortly to a few vital figures for that country. The population of France, excluding Alsace-Lorraine, changed from 27 million in 1801 to about $33\frac{1}{2}$ million in 1841. In 1901 the population had reached approximately $38\frac{1}{2}$ million, increasing to $39\frac{1}{2}$ million in 1931. France, of course, was a country with varied resources and was an old settlement. The point I wish to make, however, is that during the period from 1801 to

1841, the total increase in population in France, starting from a base of about 27 million was not much greater than the increase in population in South Africa from 1904 to 1946 as will be obvious from the following Table.

TABLE 6.
POPULATION OF SOUTH AFRICA.

1904	...	...	...	5,175,824
1911	...	...	...	5,973,394
1921	...	...	...	6,928,580
1936	...	...	...	9,589,898
1946	...	...	...	11,418,349

It is interesting also to bear in mind that in France the percentage of rural dwellers fell from 75% in the middle of the 19th Century, to 62.6% in 1891, 55.8% in 1911 and 50.9% in 1926. In England and Wales 23% of the population was rural in 1901, and 20.7% in 1921. In Germany in 1919 the rural population was 37.5% of the total.

In South Africa in 1946 only 27½% of the European population was regarded as rural. There actually was an absolute decrease of the rural European population from 1921 to 1946, while the urban European population increased by more than 100% in the twenty-five years. The increases in the urban populations of the other racial groups were relatively much greater than for Europeans but time does not allow a detailed study of these very interesting changes which all confirm the great adjustments that are taking place in South Africa.

SOUTH AFRICAN DEVELOPMENT

The measure of South African development in recent years can also be gauged from the increase in our national income which in 1911/12 was about £131 million. Just before the war in 1938/39 it reached nearly £400 million and ten years later in 1948/49, the nett national income was £832 million. Even allowing for changes in money values, this is a most impressive achievement. While it is difficult to get a proper assessment of the increase in our productivity in physical rather than financial terms, from some preliminary figures that I have seen it would appear that during the last ten years our real production has increased by approximately 60%. It is impossible to cover more than a small section of our economic activity in this short address, but I think it is of interest to analyse briefly our national income. I feel this is

important because similar misconceptions do still exist in South Africa about our various activities as exist abroad. As a matter of fact it is more important to inform the South African public adequately because visitors from abroad definitely get their opinion of South Africa from discussions with informed South Africans and events are moving so fast that even with the most wide awake people there is quite a time lag.

MISCONCEPTION ABROAD

During my recent visit to the United States and Canada, I, of course, found a very keen interest in our racial problems and incidentally also in our soil and water conservation problems. The popular opinion held abroad seems to be that South Africa is a country producing mainly large quantities of gold and diamonds and because these products are normally associated with great wealth, it is assumed that most Europeans in South Africa control and live from the production of this wealth. As mining, however, represents a wasting asset and the whole of the South African economy depends on this wasting asset, there is some concern about the long term economic future of the country, although the white man may be in a fortunate position at present. Now it seems to me of vital importance that the South African economic picture should be seen in the proper perspective. While mining certainly played the greatest part in our economic development, we have in recent years succeeded very well in achieving a greater diversification of our economy. So for instance, in the latest national income figures quoted above for 1947/48, the share of gold mining is only 8% and all other mining which includes diamonds, coal, base minerals, etc., about 2.7%. The share of manufacturing industry in our national income is 22.5% of the total. Agriculture is 14.5%, trade and commerce 14.5%, transportation 9.5%. These are, of course, pre-devaluation figures and the share of gold mining has gone up since that time because the nett effect of devaluation was simply the re-distribution of our internal income in favour of the gold-mining industry. We did not get any more dollars for the ounce of gold than we got before devaluation. Gold, of course, still plays an outstanding part in our exports and on a current production basis probably represents about 45% of our total exports. Secondary industry could not flourish as it has done, were it not for the very great importance of gold in purchasing industrial raw material from abroad.

TAXATION ON GOLD

Another impression that still seems to exist abroad is that the major revenue of the Union Government is still obtained from the gold-mining industry and that this revenue is used to a considerable extent to subsidize sub-economic industries. I think here also it is necessary to correct a wrong impression. Before, and during the war, the gold-mining industry made great direct contributions to Government revenue. Many of us felt that too heavy a burden was placed on the industry during that period. In 1947/48, however, Government revenue, comprising taxation, lease and other payments from the gold-mining industry, was £6,316,600, or less than 4% of the total revenue of £172 million for that year. In 1948/49 Government revenue from the gold-mining industry was approximately £7½ million, which was under 5% of the total Government revenue of £165 million. In 1949/50, as a result of devaluation, Government revenue from the gold-mining industry amounted to approximately £12 million or about 7% of the total Government revenue. This country therefore did receive and is still receiving great benefit from its very important mining industry, but to me it is most gratifying that we have been able to achieve the greater diversification that obtains today. This is important for other reasons too. Some years ago people in this country were very much concerned with the life of the gold-mining industry, and the effect which any diminution of activity would have on our whole economic structure. Since those days there have been the further discoveries on the West Rand and in the Orange Free State, from which it would appear that gold production will be maintained in South Africa on a steady basis for many years. The new discoveries of course mean the investment of large amounts of capital which must be found in a world which no longer has so much venture capital available, but such is the glamour of gold and so high the reputation and integrity of our experienced mining people that up to the present all the capital necessary for sound development has been found. It is now realised that even though a diminution of gold production may some day take place on the Witwatersrand, there need not then necessarily be a disastrous reduction in the Johannesburg and Reef economy. There are many other great cities in the world with much larger populations than Johannesburg whose prosperity does not depend on one basic commodity right on their doorsteps. Johannesburg for instance, already has an established water supply, a very good power supply, well

established communications and, of course, a wonderful climate. With all these advantages there is no reason why Johannesburg should not be able to continue to expand in the future because of the energy, enterprise and skill of its citizens, even although production of gold on the Reef may in course of time diminish or even disappear. Similar considerations apply to other gold mining. We have already had some little experience of what might happen in due course if gold production were to diminish in South Africa.

PRICE OF GOLD

A very important change has indeed taken place in our economy during the last ten years which really is similar in effect to a serious diminution in our gold production. In spite of the numerous discussions on this problem, its significance for South Africa and its effect on our standard of living have not yet been properly grasped by many people in this country. I refer to the price of gold which has of course increased during the last ten years, but not nearly as much as the prices of most other commodities imported from abroad. The ounce of gold today buys very much less in real goods than it did ten years ago and South Africa as a whole is poorer on this account. It requires more ounces of gold today to buy a suit of clothes or a frock, or a motor car, or a gallon of petrol or a pound of paper, or a pound of rubber or almost any other commodity than it did in 1939. Lead and zinc are eight times and copper and tin approximately four times the pre-war prices. During the extraordinary period of development before the last Great War, it paid the country to divert its productive resources to the production of gold because the purchasing power of the ounce of gold was so very high. That situation does not obtain today and it is necessary for us to take stock of the position to see whether it is indeed desirable to divert so much of our capital and labour resources into the production of a commodity which, as yet, does not command the relative purchasing power which it did in 1939. We, of course, all hope that gold will once again play its traditional and legitimate part in the stimulation of multi-lateral world trade, but in the meantime there is no indication that America will agree to a higher gold price or that the nations of the world will agree to a general devaluation of currencies. We should therefore not neglect other possible profitable avenues of development. I mention this point now because last year when we had to cope with our balance

of payments difficulties, I found a very disturbing tendency on the part of some people to argue that all new industrial development might be a burden on our balance of payments position. It was felt that no foreign exchange should be made available for the importation of new plant and machinery for secondary industry, because inevitably this would result in a further drain on our exchange resources because of the further raw material requirements from abroad for the new industry. The increased demands on our limited labour supply would also result in further inflationary pressure. It was felt however that everything possible should be done to assist the development of new gold mines because in a relatively short time their production would once again enable us to balance our payments and reduce restrictions on importations from abroad. It seems to me that this reasoning did to a certain extent lose sight of the fact that many of the Union's essential requirements previously imported from abroad now required two ounces or more of gold where previously only one ounce was needed for a specific purchase. Where we still have Import Control it is therefore very necessary for us to adopt a more selective approach and enquire very carefully as to whether it would not be well worth our while to divert some of our capital and labour resources towards the production here in the country of some of those commodities that have gone up in price so very much and now need so much more foreign exchange than before.

MANUFACTURING

After this digression into the important mining field, I should like to turn to the manufacturing industry, which has become such a dynamic and irresistible factor in our social and economic structure. We hear little these days about protection of industry or of infant industries ; the emphasis now is on improvement in efficiency on reduction in costs and on higher productivity with concomitant higher wages. European employment in secondary industry has progressed from 85,000 in 1927/28 to 143,000 in 1937/38 and 210,000 in 1947/48. The corresponding figures for Non-European employment are 123,000 for 1927/28, 204,000 for 1937/38 and 401,000 for 1947/48. In ten years therefore the index of European employment in manufacturing industry has gone up by 45% while Non-European employment has doubled itself in ten years.

While the total number of Europeans engaged in various activities increased from 741,685 to 888,181 from 1936 to

1946, the number of Europeans engaged in Agriculture, Forestry and Fishing showed the only decrease, namely from 181,409 to 167,822. This also is indicative of the effect of the Industrial revolution on our farming activities and is a trend that should be noted very seriously in the light of our country's food requirements.

The gross value of output of secondary industry was £106 million in 1927/28, £187 million in 1937/38 and £583 million in 1947/48. With regard to the wages paid it is interesting to study the following Table of numbers employed and wages paid in industries in the Union.

TABLE 7.

NUMBER EMPLOYED AND WAGES PAID IN INDUSTRIES
IN THE UNION.

				1937/1938	1947-1948
EUROPEAN :					
Number	...	...	...	143,760	210,438
Wages paid	...	...	...	£33,768,000	£91,883,000
Average	...	...	...	£234·9	£436·6
NATIVE :					
Number	...	...	...	156,204	308,080
Wages paid	...	...	...	£7,097,000	£31,838,000
Average	...	...	...	£45·4	£103·3
ASIATIC :					
Number	...	...	...	12,802	18,812
Wages paid	...	...	...	£807,000	£3,246,000
Average	...	...	...	£63·1	£172·6
COLOURED :					
Number	...	...	...	35,754	74,795
Wages paid	...	...	...	£3,069,000	£13,219,000
Average	...	...	...	£85·8	£176·7

Note.—Wages include cost of living allowances.

LABOUR LEGISLATION

The average wage rates show a very interesting and important trend because it is obvious from this Table that the relative increase in wage rates for Non-European employees has been greater than for European employees. More recent figures further substantiate this trend. This tendency is particularly interesting in the case of Native employees where it must be assumed that large numbers have been recruited very recently from rural areas where there are

few contacts with industry. Many unskilled people are therefore being trained in industry and during such periods of low productivity it is not possible to pay high wages, in young developing industries which have to compete with well-established products from abroad. It is also worth mentioning that our labour legislation is among the most advanced in the world and that we have had singularly few labour disputes or strikes during the last twenty-five years.

During the war, and towards the end of the war, the development of South African industry was much publicised. This development should however not be exaggerated. It must be borne in mind that during the war it was very difficult to get plant and equipment and raw materials from abroad. South Africa put a relatively large army into the field, increased its gold and agricultural production and superimposed on its normal industrial activity a very considerable munitions industry. Not many new industries were started during the war and it would be wrong to think that the war production effort was started from nothing. War production was possible only because of the sound basic structure of South African manufacturing industry which could then be extended during the war. Many new workers were trained, new skills were mobilised and a great deal of consolidation took place, but it was not possible to procure new plant and equipment on the scale which would have been possible and likely if there had been no war. After the war it was possible to import more plant and equipment but only with considerable difficulty and great delay. More recently the further importation of capital goods was also curbed by our balance of payments difficulties, partly caused by excessive purchases of consumer goods. A nation, like an individual, must live within its means. A nation cannot indulge in very considerable capital expenditure and at the same time spend money at a high rate on consumers goods. If there is no flow of capital from abroad, the total spending must inevitably be curtailed because as yet our total productivity is still too low to build up sufficient capital for all our development schemes while at the same time providing essential consumer needs.

RACIAL PROBLEMS

In a general way, all of us will agree that technological progress and industrial development will probably make the greatest contribution to the solution of our many racial problems in South Africa which really boil down finally in the simplest form to an economic problem. It is worth while,

however, just to mention a few specific examples to illustrate the point. Twenty-five years ago the Union of South Africa was faced with a very serious "poor white" problem. Several hundred thousand white people from good basic stock were facing the future with hopelessness and despair. In 1926 a more positive protective policy for industry was launched and this really was the beginning of a new era. I myself had the privilege of becoming associated with the establishment of the South African Iron and Steel Industrial Corporation (IsCOR) in 1928 and right through the building period, during the terrible depression years, one came into contact with large numbers of fine Europeans from the platteland where they could see no future. They were flocking to the towns to endeavour to find a new life. Many such valuable people found employment in IsCOR, which was probably one of the most complicated industrial undertakings ever to be attempted in South Africa. The employment of unskilled people in a highly complicated industry is no easy task. Management has to face the great responsibility of putting highly complicated plant, costing a great deal of money, under the care of relatively inexperienced operatives. The penetration of operatives into industry also was not viewed with equanimity by the old-established craft unions, many of whose members felt that their futures would be jeopardised by this new great influx. They could not see the future clearly and it was an act of faith on their part to accept this influx on the assumption that increased production by the European operative inevitably meant a safer position for the skilled artisan. It may sound surprising to you today that we had to face difficulties at that time in introducing European operatives into industry. The early fears of the skilled artisan have proved groundless. The services of the skilled man today are at a premium and the country is short of many thousands of skilled men. This position was brought about by the mobilisation in the first instance of European operative labour, who also acquired greater prosperity and decent homes. Today we can say that we have no "poor white" problem as understood twenty-five years ago. Technological advances in the short space of twenty-five years have almost completely eliminated the dire threat of those days. Europeans have been able to improve their skills to a very high standard and let me assure you that there are many outstanding industries in the country today where efficiency is of the highest order. I need only remind you that the iron and steel industry which caused so many grave qualms in those early

days, is today an industry of which the whole of South Africa can be proud. I saw some figures recently which showed that the price of imported steel was from 75% to 100% higher than the price at which the local product was sold. There is nothing wrong with any industry that can achieve such results. Many great engineering industries have developed as a result of that first establishment and tens of thousands of new people have found employment.

NON-EUROPEAN EMPLOYMENT

But we have progressed further. Non-European employment also has increased by leaps and bounds. There still seems to be too great a fear on the part of European employees that increasing native employment will jeopardise their economic position. I think we can learn the lesson from the past that this is most unlikely. We have today a very great shortage of skilled men in South Africa, but there is also a shortage of less skilled employees. Our great problem today is to increase the speed with which the limited available supply of labour can be trained to greater productivity. In this connection I should like to refer you to the outstanding address delivered by Dr. Eiselen, the Secretary for Native Affairs, on "Rationalising South Africa's Native Problem". It deserves the most careful study and attention. There are many profitable projects that could be expanded today if skilled labour and capital were available.

INDUSTRIAL DEVELOPMENT CORPORATION

With the establishment of the Industrial Development Corporation in 1940, I became associated with industrial development in a broader sense. Generally the function of the Corporation is not to start industries on its own, but to assist others in the development of industry. While the actual financial contribution of the Corporation, which operates on strict economic lines, may not have been so great in relation to the total industrial development which has taken place during the last ten years, I do believe that the guiding influence of the Corporation has been of considerable value. Great emphasis has been placed in the development of those industries in which South Africa has a comparative advantage, and great importance was attached to the possibilities of establishing industries in rural areas and in undeveloped areas. In this connection I should like to quote from my recent Address to the Shareholders of the Corporation.

“ The Corporation’s activities since its inception have been mainly directed towards the development and better use of the Union’s latent resources in so far as this can be achieved by industrial development. In consequence we have paid particular attention to those fields in which it has appeared possible to develop the use of types of labour and materials hitherto more or less neglected by reason of their nature or location, at the same time giving practical effect to the conception of decentralization. You will notice in this connection that several of our major interests as, for example, the Good Hope Textile Corporation at King William’s Town, Fine Wool Products at Uitenhage and Masonite at Estcourt, are in rural areas. It must be realised, however, that effective decentralisation is dependent on many factors of which the availability *inter alia* of adequate and suitable power and water supplies is of prime importance.”

TEXTILES

Our available labour resources in both Coloured and Native labour and their employment in activities suited to their ability and temperament, have featured largely in our policy and have resulted in the pioneering of textile establishments such as The Good Hope Textile Corporation, on Native Trust land in the Ciskei, and Fine Wool Products at Uitenhage. Preliminary investigation pointed towards the probable suitability of Native and Coloured labour for a textile industry producing good quality materials, but this remained to be proved, and it is with much pleasure and gratification that I can now report to you that our endeavours in this respect are meeting with marked success. The subsequent establishment of several other textile industries in South Africa may be ascribed in no small measure, I think, to the lead given by the Corporation in this sphere of activity.

The establishment of Nasfeed some seven years ago was designed to facilitate greater productivity in farming by the development of the manufacture of balanced rations for livestock. This industry has now reached very significant proportions. Attendant upon it has been the development of the oil expressing industry which has, in its turn, made possible the profitable cultivation of crops like groundnut and sunflower seed to such a point that the Union is no longer dependent upon other countries for its supply of oil seeds ; in fact, vegetable oils are now being exported in fair quantities while the residual cake is used within the Union for the feeding of cattle.

TIMBER

Waste timber from the Union's wattle plantations is now being used to produce "Masonite", a wood board of many uses ; molasses, a by-product of the sugar industry, is being used to produce Food Yeast, which is rich in protein and Vitamin B and is proving valuable in the balanced large-scale feeding of Natives, especially in the mining industry ; Wool grease is being produced in quantity from woolwashery effluent. The processes involved in the manufacture of Food Yeast and wool grease have been largely perfected by the Corporation's staff and when, in due course, Food Yeast is produced from distillery dunder, two valuable products will have been won from highly noxious industrial effluents.

In the engineering field our associations have been mainly with concerns whose activities are directed towards developing the utilization of locally produced pig-iron and steel and the production and processing of non-ferrous alloys, the latter being an important branch of the industry, previously somewhat neglected.

The Corporation has paid considerable attention to the beneficiation of products from our flourishing sheep-farming industry and, as a result, a lead has been given in the establishment of wool-combing and the worsted industry in general, in the production of wool felt, in the production and export of pickled pelts for the glove-making and allied industries, and recently in the processing of karakul pelts by a world-renowned process for export in this form to the international fur trade.

From the comments I have just made you will appreciate the diversity of our interests, and while I do not propose to give you an exhaustive list of the activities with which we are, or have been, associated, the following additional examples will, I think, indicate the general pattern of our investment ; the manufacture of packaging materials of all kinds, milk powder and breakfast foods, footwear and wearing apparel, domestic baths and glazed wall tiles, truck and bus bodies, plastic switches and electric fittings, and livestock remedies and insecticides, all of which are of fundamental importance to the country's economic requirements, contributing as they do towards the basic needs of the community in respect of food, clothing, housing and transport.

HOUSING DIFFICULTIES

From the picture I have given you of the development that has already taken place in secondary industry in South

Africa, you will realise that there are still great opportunities for development and consolidation in the well-established industrial areas. A more rapid development in these areas would have brought with it even greater difficulties in providing housing and other important social services. These developments have brought with them the difficult problems associated with migrant labour and the undermining of family life in the native reserves. The thought therefore arises naturally that industries should be developed in rural areas and in the Native Reserves. Agriculture is a very exacting occupation, requiring great skill and a high degree of efficiency. It probably requires more skill and specialised knowledge than any other profession, but it will take time and much specialist teaching to bring agriculture to a high degree of efficiency in Native Reserves, particularly where there is no tradition of intensive and regenerative cultivating of the soil. There are many areas in the Reserves where there is much overcrowding and excessive exploitation of the soil. The Department of Native Affairs in certain parts is trying out a policy of close settlement, in order to relieve the pressure on the land, but it must be obvious that such close settlement schemes can be successful only if the people so settled are successfully employed. One of these close settlement schemes was being developed at Zwelitsha, near King Williams Town, and the idea originated with the Industrial Development Corporation that a textile industry on native land might be established as near as possible to the closely settled area. Now it is not so easy to establish an industry in a rural area. The individual industrialist who has the necessary knowledge of his industry and the necessary capital for its expansion usually prefers to start in a well-established industrial centre where power and water are already available and where he has all the advantages of a concentrated market, housing and transport facilities. In the large urban centres he also has a pool of labour from which he can draw his requirements. In an undeveloped area, however, the industrialist starts at a grave disadvantage. Not only has he to establish his factory in which he has specialized knowledge, but in addition he usually has to make his own arrangements for providing and financing his power supply, his water supply, his housing and his transport—all fields in which he has no specialized knowledge or experience. In addition he has to spend much money in training unskilled employees to a reasonable efficiency. When he has done all that, he faces the prospect that when he has trained his employees at great cost they may leave him for the attraction

of the large cities, even though some of these attractions may be of a specious kind. It therefore requires great courage on the part of the entrepreneur to take the decision to establish himself in a rural area or in a Native Reserve. The question of wage rates also is of great importance. There is a general tendency in the country today to demand uniform wage rates right through the whole country. I wish to emphasize that it will be almost impossible to establish important industries in undeveloped areas if the industrialist is forced to pay wages in the country equal to the wage rates customary in the large urban centres. While therefore we may all agree that it is very desirable for the country as a whole that there should be decentralisation of industry, it is very difficult to influence the individual industrialist to face all the disadvantages I have enumerated in pioneering a new venture in unknown territory. Great efforts were made by the Industrial Development Corporation to try and influence private industrialists to establish themselves in rural areas or in or adjacent to, Native Reserves, but although we had some measure of success in establishing some rural industries, we at first could find nobody who would take the cold plunge in a Native Reserve. Our investigations showed that a textile industry of the type envisaged by us could not be established at that time on the then existing wage structure without very high protection in the initial stages. We were opposed to the idea of high protection because textiles represent a very important item to the low income groups of the country and it was not desirable to increase the cost of all importations by means of a high protective duty in order to safeguard a new industry which might be able to supply only a very small portion of the country's total requirements. The Corporation therefore approached the problem from the aspect of installing modern and efficient machinery and the belief that natives could be trained to a high degree of efficiency in the operation of modern equipment. Experts were imported from abroad by the Corporation to investigate the scheme in conjunction with our own technicians and the final result was that the King William's Town area was chosen as a very suitable spot to start such an industry. We were on the point of approaching the Government to allow the Corporation to proceed on its own in the establishment of such an industry when we were approached by the Calico Printers' Association of Manchester regarding the possibility of developing the production of textiles in South Africa. This firm had great experience in establishing textile industries in China, Java, India and Australia, and they found that our plans fitted

in very well with the ideas they had in mind. We could have found no better partner in establishing an industry of a type, which up to that stage, no-one else was willing to pioneer in this country. We experienced all the difficulties I mentioned above. Our factory buildings cost more at King William's Town than they would have cost in a larger centre, because skilled artisans had to be brought from their homes in other areas to do the job. Special arrangements had to be made for providing an adequate water supply and this problem finally found a happy solution in the building of the Rooikrantz dam on the upper Buffalo River by the Irrigation Department. I am happy to say that this dam is now nearing completion. For a long time the power supply was a very serious bottleneck and we had the usual difficulties with housing and transport.

NATIVE OPERATIVES

We naturally had some diffidence about the ultimate efficiency of native operatives in such a specialised industry—a million and a quarter pounds were invested in the first phase of this industry and its ultimate success depended entirely on the adaptability and efficiency of the local native operatives. Special schools were, of course, arranged for the training of operatives before they were actually put on to the various machines in the mill. Here I should like to pay tribute to the outstanding engineers from Lancashire, particularly Mr. Ashworth, for the remarkable way in which the training was organised. As a result of the experience we have now gained, we have found our expectations regarding the potentialities of the native operative largely confirmed. In individual cases very high efficiencies in spinning and weaving have been achieved in a relatively short time, but of course individual efficiencies alone do not make a successful undertaking. In a modern factory it is essential that the average efficiency should be of the highest order, but present indications are that with patience and perseverance a high overall efficiency will be achieved and maintained. Here, as in other industries, it is up to the African to show what he can do when he is given the opportunity of improving his efficiency and his productivity and of raising his standard of living. Modern canteens have been provided which supply well-balanced, nutritious and tasty meals on a partly subsidized basis. The wage rate for native employees who have obtained the requisite average efficiency is over £2 a week, which is more than double the wages paid for comparable occupations

in Japan for instance. Only native males are employed at present, although originally we envisaged the employment of females also, to a very large extent. We have had to depart from this idea because women may not work at night according to South African law. Originally our thought was that if female members of a family could be employed in a factory under the most modern protected conditions, the earnings of the family group could be increased very considerably. This factor in our industrial legislation therefore requires very earnest consideration in my opinion. Women are not yet employed to the same extent in South African industry as in other countries.

In our country, it is also most important, that all available capital equipment should be used to the fullest possible advantage in providing the maximum opportunity for the largest number of operatives. It is therefore necessary to work three shifts in such undertakings as is the custom in enlightened industrial countries, like the United States of America where three shifts are worked regularly by women operatives in the textile industry.

Greater sacrifices will have to be made in the future by the people of this country to save more money and to consume less in order to provide the capital necessary for our further development and the fullest use should be made of the capital equipment we have available in this country. A factory such as The Good Hope Textile Corporation could not compete with the outside world where three shifts are worked if it did not also follow the same policy.

INCENTIVES

The labour turnover at King William's Town has been high, thus putting an undue strain on training and efficiency. In the early stages there were definite indications that the wages saved by operatives enabled them in a relatively short time to take a long rest because their wants in a rural area were relatively easily satisfied. Serious questions have even been raised as to whether the wages may not in these circumstances be too high at this time. My own view, however, is that this may be only a temporary phase. With greater earnings wants will increase, in turn providing a greater incentive for more regular and permanent employment. This in turn will lead to higher efficiency and higher earnings. Already the labour turnover rate has dropped considerably and a very

large number of those re-employed or of those seeking employment are previous employees of the company.

A textile factory needs large quantities of good water and one of the thoughts at King William's Town is that in due course the effluent from the works will be usefully applied for irrigation purposes, thus also assisting in a small way in increasing the food supply and providing a happy link between industry and agriculture.

The raw material for the factory is still imported. This was definitely necessary in the early stages when labour had to be trained and great emphasis had to be placed on accurate grading and high quality of raw material. There is a strong feeling in the country that only those industries should be encouraged which use exclusively South African raw materials. This, of course, is a very desirable ideal, but it is extremely difficult to find industries where a local raw material can be taken through all the phases of manufacture to the final product. Usually an industry must be started from some intermediate stage. So for instance in Great Britain, in the textile industry there are enormous units spinning only yarn from imported cotton. Then, again, there are many others who buy only yarn and weave the cloth. Then again, many make their living only by bleaching and dyeing the cloth and still others do the printing of the cloth for their clients. At King William's Town the complete process is envisaged right from the raw cotton, through the spinning and weaving, bleaching, dyeing and printing. At the present we have got to the bleaching stage and it can be said to the honour of the native operatives that the quality of the product leaves nothing to be desired.

FUTURE FOR COTTON

Soon we shall be ready to tackle the next phases of vertical development and also a broadening of the foundation. Soon, also, we may be able to use South African raw materials to a greater extent and I visualise quite a considerable future for cotton growing in this country, particularly in Northern Zululand and the Eastern Transvaal. Years ago cotton was grown with some success in South Africa, but in those days the growers were entirely dependent on export and the fluctuations of world market prices. Today several other textile factories have started up in the country and there are possibilities of a considerable and stable local consumption. Not only do we need the fibre, but the cotton seed is a very

valuable industrial product, providing edible oil and protein cake for animal feeding. In our present economy the cotton seed seems to have advantages over other oil-bearing seeds. It has a high ratio of protein cake to oil. In the space of a very few years the country has made itself independent of foreign supplies of edible oil, used also in the production of cooking fat and margarine. We are, however, still very short of protein cake. With a considerable production of cotton seed however we may find a better balance between these two important products. Protein cake is very necessary for the adequate feeding of dairy cows, the importance of which need not be stressed further. Cotton growing may also provide valuable employment during the picking season for women and children in suitable areas, so that it appears that the development of the textile industry in South Africa may, in due course, have the most far-reaching results in improving the productivity of its people. It is only by importing the raw material for the textile factories at this stage that this benevolent chain can be started. A comparative advantage for the establishment of an industry does not necessarily depend only on the immediate availability of the raw materials. The type of local labour available is also a very important factor in deciding the type of industry to be established. If the labour is available, as it is in the Native Reserves, every effort should be made to mobilise that labour to higher productivity even on imported raw materials, as has been done by other great industrial countries.

I have dealt at some length with the development at King William's Town because it might form a pattern for development in other undeveloped areas. We have there an example of a new industry established by the co-operation of highly-skilled overseas' manufacturers with South Africans with local knowledge and capital. It would appear to me to be one of the most promising types of activity on which we can base sound development in the future.

TIMBER

There is another field in which South Africa seems to have a considerable natural advantage and that is the growing of timber in certain areas. Although we are a very poorly-wooded country, there are certain areas where climatic and soil conditions are extremely favourable for the rapid growth of certain exotic trees. Wattle growing in certain parts of Natal and in the Eastern Transvaal has been practised successfully

for many years for the production of tanning material. It is only recently that the waste wood is also being used in factories such as the Masonite plant at Estcourt mentioned above. More recently, a great new paper project has been initiated for the production of kraft paper at the mouth of the Tugela River. This industry will be based on relatively low cost locally produced timber. According to Dr. I. J. Craib, in the Journal of the South African Forestry Association, the mean annual increment of wood per acre in South Africa averages from 40 to 390 cubic feet, depending upon site, quality and species. A suitable selection of fast and medium-fast growing pines on land which is a mean between first and second quality may be estimated to yield a mean annual wood increment of 280 cubic feet per acre. Compare with this the mean increments of the following countries: Germany, where the practice of forestry is most advanced, 50 cubic feet; Sweden, 37 cubic feet; Russia, 35 cubic feet; Canada, 7 cubic feet; United States of America, 13 cubic feet. It seems to me that tree planting in certain native areas may not only be a very valuable means of protecting water-sheds, but may also be the basis in the future of a highly profitable industry. One even thinks of the possibility of exporting pulp from South Africa for the manufacture of paper and artificial silks abroad.

The present industrial development in South Africa is designed largely to satisfy our own requirements. While there may be opportunities in certain selected lines for export to other parts of Africa, I feel that our industry in South Africa should be devoted largely towards the satisfaction of the wants of its own people. There is, therefore, a great selling job to be done in the future. I think of the term in its most constructive sense.

UNDER-DEVELOPED AREAS

The progress of under-developed areas in our modern machine age must depend to a large extent on the availability of capital and highly-specialised technologists. Today, the opportunities for capital formation are not as great as before the war. Taxation is much higher for the individual and the individual investor is not prepared to venture his reduced savings to the same extent as before. Large capital forming institutions now control most of people's savings and these institutions must inevitably follow a very conservative policy of investment. The skilled technologists, on the other hand

usually have no money to venture themselves in new enterprises. There are not many individual manufacturing firms with both skill and capital which would be willing to start industries in undeveloped areas on the lines of the King William's Town enterprise. It seems therefore that for the development of Native Reserves in South Africa we should think in terms of an organisation similar to the Industrial Development Corporation, which can mobilise both capital and technical skill for the establishment of new industries. It will have to be an organisation which can wait a long time for a return on its capital, because in my experience in South Africa important new industries usually take about seven years before they reach the dividend paying stage. The Social and Economic Planning Council in its Ninth Report on "The Natives Reserves and their place in the economy of the Union of South Africa" suggested the creation of a regional development authority under the aegis of the South African Native Trust to undertake this development.

My remarks tonight, have I think, indicated that South Africa is in the grip of economic forces of irresistible power. It will be extremely difficult, nay, almost impossible to curb these forces. These forces have led to considerable improvement in living standards of all low income groups, but also to many distressing and unsatisfactory conditions and have caused much heart-burning and suffering but honest and valiant attempts have been made and are still being made to alleviate difficulties. I have not discussed the great advances that have been made in coloured and native education, nor have I referred in detail to the great housing schemes that have developed all over the country. Social services for natives, such as children's allowances, disability grants for the blind and disabled, old-age pensions have been introduced. Much remains to be done as much will always remain to be done in human relations, but I do not think our people need hang their heads in shame when we consider the material achievements of the last twenty-five years. Let us carry on doing our duty to our fellowmen and showing the maximum tolerance and respect for human rights and human dignity.