

and 1970. Although not exactly correlating with the growth of white population it shows the main periods of development, reflecting economic conditions and aspirations within the municipalities. In fact in these seventy years it was only in the 1950's that there was a large surplus of proclaimed residential stands in the region, which, having been taken up in the 1960's explains the low number of residential stands proclaimed between 1960 and 1969, compared to the growth of white population (which will be seen in the 1970 Population Census).

Whilst the location of mine townships has been a function of the occurrence of payable gold beneath the earth's surface, and the areas owned by the separate gold mining companies, similarly, extensions of the nodes of residential and commercial areas have been influenced by the mines. The proximity of gold mines whose lands could not be included in Town Planning Schemes affected the planning of residential areas, especially in Springs where for many years developments to the south-west of the town centre were impossible as the land was being utilised by Springs Gold Mining Company Limited. The early coal mining has had an even greater legacy through undermined land, preventing residential development to the south and south-east of Springs, and to north-west of Brakpan Township.

In the light of the above-mentioned factors the spatial development of the residential townships in the region between 1900 and 1970 can be understood. Early development around the core is seen in all three centres by 1920, although the belief in the more permanent nature of gold mining than coal mining had led to the earlier proclamation of townships in Nigel. By 1920 however with the proclamation of Brakpan, Springs and Geduld townships, Brakpan and Springs had overtaken the population of Nigel (see Tables 6 and 7). The next main period of development,

/ 1930-1939,....

1930-1939, saw the proclamation of Anzac, Dalview and Brenthurst, developing from the core of Brakpan, and the extensions in Springs at Casseldale, Strubenvale and Petersfield, separated from the core by undermined land. Since 1939 this basic pattern has been consolidated with the linking of the residential areas of Brakpan and Springs by the proclamation of Pollack Park, and the residential developments south of Springs on the Springs-Nigel road at Selection Park and Selcourt, with the soon to be proclaimed Sharon Park linking this development to Dunnotar.

Although the Bantu population of the region has remained virtually static between 1946 and 1970 there has been a great change in its spatial distribution in this period. Until 1946 the majority of Bantu consisted of migrant mine workers, living in compounds on mine property, with only a small number of Bantu living in municipal townships. With the closure of the mines the migrant mine workers returned to their homelands, whilst there was a general influx of Bantu into the Witwatersrand. This influx of a permanent labour force has necessitated the creation of special locations ; Taskane for Brakpan ; Kwa-Thema for Springs ; and Deduza for Nigel.

Local Market Created by the Gold Mines

The growth of gold mining in the East Rand created local spending power from two sources, the Mining Company itself and the mine employees. Figures for this total spending power have already been given in Chapter 2 for Nigel and Modder. 'B' Gold Mines, both mines in 1950 exceeding the amount of £500,000 (N.R.D.C., 1960). Needless to say, not all this would be spent in the locality, but many services were necessarily local and led to the expansion of the commercial and industrial sectors. It was mainly the spending power of the white mine employees that boosted the local economy, creating the demand for increased number of shops and services in the locality, this demand

/ being

being supplemented by the purchasing power of the Mining Companies, obtaining some provisions in the locality. With an active population of 15,000 whites and 120,000 non-whites, earning over £ 10 million in wages engaged in gold mining at its peak in 1950 (Chamber of Mines, 1968), the boost to the commercial sector from this source is understandable, and the three main commercial centres of the region, Brakpan, Springs and Nigel, all showed signs of prosperity. With this development of the local economy the towns became the natural focus points for commercial demand from neighbouring areas, boosting the local economies still further. Springs is especially notable in this respect, becoming the business centre for a large proportion of the Eastern Transvaal.

Gold mining therefore created the demand and stimulus for the development of non-basic activities in the East Rand, a sector whose support has since 1950 been in the process of transference from gold mining to industry.

Build Up of Secondary Industry in the East Rand

Although gold mining stimulated the commercial and business developments in the East Rand, it did little to stimulate industry.

Gold mines do of course require engineering firms to service and mend mine equipment, and several of these specialist firms located around the business centres. In the main, due to the fact that most of the mines were tied to large mining houses who purchase stores and machinery for their mines through a central department, the location of firms manufacturing machinery and equipment for the gold mines in the Witwatersrand were little influenced by the particular localities of the mines.

The development of industry in the East Rand since

/ 1950

1950 has largely been related to other locational factors, although gold mining has indirectly been of importance in its creation of economic development in the region. Very little manufacturing industry existed prior to 1950, with most of what there was being in Springs, which by 1950 had 21 small manufacturing concerns (Springs Town Council, 1962).

Industrialisation of the region came with the setting up of various industrial townships in the municipalities and the efforts of the municipalities to attract industry. Apart from the privately owned industrial township of Enstra, two townships were proclaimed pre-war, Vulcania and Nuffield. Brakpan's Vulcania was however a very small township of 33 morgen, set up largely for the re-location of existing industries in the town. Nuffield, by contrast, a site of 155 morgen, represented a serious attempt by the municipality to attract industry to Springs. Little development took place till after the war, when several industries were established which encouraged the council to take further steps, resulting in the establishment of a second industrial township, known as New Era, in 1952. Springs thus got a head-start over the other municipal areas in the industrialisation of the East Rand.

The non-contemporaneous build up of industry in the three municipalities can be viewed as a function of what could be called the 'municipal factor', that is, the efforts of differing municipalities to attract industry. These efforts take three main forms :-

- (i) Getting land zoned and laid out for industrial townships with all the provisions that industry require, especially, railway sidings, water and electricity.
- (ii) Providing the land at cheap and competitive rates.
- (iii) Providing sufficient residential townships to house the workers for the industries.

/ Nigel

Nigel Municipality, realising the need for industry to replace gold mining laid out two townships in the 1950's, Pretoriusstad in 1951 and Vorsterskroon in 1956, at land prices of only £ 100 per acre, the cheapest at that time in the Witwatersrand (compared to £ 1750 per acre in Germiston), and stressed the cheap residential stands and adequate labour supply available (Nigel Town Council). Consequently most of the stands were filled by 1960.

In contrast the Brakpan Municipality was hesitant to attract industry to the town, wishing to preserve it as the garden-suburb of the Witwatersrand. By the end of the 1950's, realising that they were being left behind, they proclaimed a large extension to Vulca, a (109 morgen), and went beyond providing basic facilities by building some factories themselves, renting them out to industrialists. Brakpan hence lagged behind Nigel and Springs in municipal initiative, and only now, with the proclamation of Van Eck Park in 1970, is it beginning to realise its potentialities for industrialisation.

The municipal authorities have therefore, by their actions in attracting industry to the areas, been able to play an important role in countering the effects on the local economy of the decline in the gold mines, the effects of which will be examined in the next chapter.

/ CHAPTER 4

CHAPTER 4

EFFECTS OF THE TRANSITION OF THE ECONOMIC BASE

The transition of the economic base of the region has had extensive geographical and economic effects. The decline in the industry utilising the major proportion of land in the region and its replacement by a more spatially concentrated form of economic development, has, and will continue to have important spatial consequences in the region. These spatial consequences have however partly been considered in Chapter 3, and will only be slightly elaborated in this chapter. It is more the effects on the structural economy of the region that will be examined in this section, developing from the dynamic analysis of the economy between 1951 and 1964 and its explanation of the continued growth of the service sector of the region, to an analysis of the change in employment and population, and the more recent indicators of economic health.

Spatial Effects

The spatial effects viewed already have been related to the fragmented pattern of residential development resulting from, the restriction on expansion of certain residential areas by the proximity of mining land, and the proclamation of some mine townships as municipal townships. Apart from the effects on residential areas, other effects on the spatial pattern of development in the transitional period have resulted from two factors. Firstly, the closure of the mines and consequent release of mining land, and secondly, location and expansion of industrial townships in the region.

Release of Mining Land

The release of mining land will have great significance

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for planning in the municipalities, owing to the peculiar position which mining ground occupies in the legal framework of South Africa. In its short history of development most of the East Rand region has been subdivided into proclaimed mining land, (see Figure 8), that is, land which has been proclaimed a public digging for precious metals or base minerals. Whilst 'proclaimed land' it is exempt from any municipal or town planning scheme. When the mines close the land is not immediately de-proclaimed as most commonly the mining companies keep the land for a period longer and apply for S.R.P.'s, written permission from the Mining Commissioner to use the surface of 'proclaimed land' for other than mining purposes. Eventually if the Government Mining Engineer is convinced that the land is no longer needed for mining purposes he may have it de-proclaimed. The land then becomes like any other piece of land awaiting development (Gregory, 1969).

In respect of the disposal of mine infrastructure, the legal position is further complicated by the different forms of land ownership by mining companies. Often the mining company will have leased the mining rights from the owner of the original farm and hence when the mine closes the ownership reverts to the original owner, whilst other mines own the land themselves. In the East Rand there have been examples of both types of ownership, East Geduld, Grootvlei, New Kleinfontein and New Van Ryn being the mines which have leased mining rights. The significance is that if the mines have only leased the land they will have no rights over the mine infrastructure which will be left on closure, whilst those mines that own the land frequently dispose of the infrastructure, either through a property company e.g. Daggafontein G.M. ('The Star', 8.3.69), or sometimes themselves e.g. Vogelstruisbult G.M. selling one-third of Vogelstruisbult mine township to Union Carriage and Wagon Co. Ltd. , Nigel ('The Star', 8.3.69).

/ The

The complicated legal position, as outlined above, has hence led to very different processes of spatial re-adaptation following the closures of the mines. So far, the effects have not been all that great. The time lags involved in the de-proclamations and the municipal planning process have led to little actual development on de-proclaimed land, with the notable exception of Springs G.M., the infrastructure of which has been completely cleaned up since closure in 1962 and is now incorporated in town planning schemes. The significance on the spatial patterns of development in the future will be much greater, with planning being able to be based on all land in the municipalities rather than only a small portion.

The Location of Industrial Townships

Whereas the spatial economic development of the gold mining phase was spread out over the entire region, the industrial development is spatially concentrated in large industrial townships of which there are at present seven fully developed :- Vulcania, Enstra, New Era, Nuffield, Selection Park, Vorsterskroon, Pretoriusstad, and Van Eck Park to be proclaimed in 1970.

The development of these industrial townships has been facilitated by one of the main locational advantages of the region, in its P-W-V context, the flatness of land, allowing the development, and possible extensions, of large industrial townships. Vorsterskroon for example, a township of 115 morgen, has a degree of topography of only 40 feet over its area. The other main locational factors influencing site have been, the proximity to existing railways (on sites where South African Railways can be persuaded to put sidings through to the township), and secondly, the spatial relationship to residential areas, it being general policy to site an industrial township so that Bantu workers do not have to cross white residential areas to reach work.

/ the

The latter factor can be seen in the siting of industrial townships in Brakpan and Nigel, but in Springs, restrictions on development, namely mining land, have prevented such locations.

Hence a new spatial pattern of economic development is beginning to emerge, based on the industrial townships and residential areas having greater locational freedom in the region.

Economic Effects

It is appropriate when faced with the decline of the basic activity of gold mining and the change in the economic base of the region to analyse this transition in terms of economic base analysis. Although not frequently utilised in geographical essays, and having many limitations which detract from its pure economic, and planning usage (Isard, 1960 ; Alexander, 1954 ; Lane, 1966), this form of economic analysis is suitable for the study of a region in which the basic and non-basic sectors can be clearly defined. Not only is it able to show the absolute and structural change in basic employment, but it can explain quantitatively the anomaly of the expansion of the service sector with the simultaneous decline in base employment. Whilst not attempting to use the ratios in their dubious role of exact prediction, they provide a useful aid to the understanding of the effects of the transition and provide a base to more detailed analysis of the industrial base to be undertaken in Chapter 5.

Transition in terms of Economic Base Analysis
Segregation of Basic and Non-Basic Activities . As outlined in the Introduction, the prosperity of any region is tied to a limited number of basic economic activities in which it has specialised, and the prosperity of the non-basic activities and the regional economy will vary according to changes in the base element. It is necessary, especially

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when confronted with the situation of an economic base transition in the region, to identify, segregate, and weight, the area's basic activities over time, and to see their quantitative relationship to non-basic activities.

Two main problems here confront the analyst. Firstly, the technique to segregate the basic from non-basic activities, and secondly, the appropriate unit of measurement for these activities.

As this section is concerned with the dynamic aspects of the economic base an industry-by-industry survey is of little use, as this will only give data for the present. The method which has been most widely used in analyses of the economic base has been the derivation of indices of local specialisation (location quotients), and their application to employment figures for the region, to give quantitatively the 'basicness' of various industries (Hoyt, 1949 ; Mattila and Thomson, 1955 ; Isard, 1960). For this information one therefore has to turn to published statistics. With the dearth of comparative statistics for South Africa this presents many problems. For a start, comparative statistics are restricted to employment as the unit of measurement, which, although being an accepted measure in economic base studies, has deficiencies (Barna, 1962), and is not the ideal measure.^I Also, there is a great time-lag between the collection, analysis and publication of statistics. The latest accurate statistics for population are the 1960 Census, whilst for manufacturing, the 1963/64 Industrial Census, which will be published in 1970. To obtain comparative extra-manufacturing employment figures for 1963/64 therefore necessitated extrapolations from population figures.

It was only possible within the limitations imposed by the statistical base to take three years for the

/ comparison

I. Other theoretical alternatives forwarded have been, income generated by industrial origin and value added by firm.

comparison of the economic base, 1951, 1960 and 1963/64, of which only 1963/64 necessitated extrapolations. This period covered the main period of economic transition and showed in quantitative terms the effects on various sectors of the economy. The extrapolations, as shown in Table 27 (Appendix I) for the population of South Africa and the East Rand are based on official extrapolations by the Bureau of Census and Statistics, and the individual municipalities (Municipal Year Book, 1967 ; Statistics of South Africa, 1968), whilst the figures for extra-manufacturing employment in the East Rand for 1963/64 have been taken to be the same as 1960. Although the latter is probably an underestimate in most instances, it does not affect the validity of the analysis as none of the sectors are basic or near-basic, and hence the only effect of the assumption is to lower the level of non-basic employment for 1963/64 below that which could reasonably be expected in the light of developments in this period.

Location quotients were hence derived for 1951, 1960 and 1963/64, for the various employment sectors of the economy (see Appendix I for methodology), and applied to local employment figures to give quantitatively the surplus (basic) workers in the various employment sectors. The results are shown in Table 9 with the division of employment for the three years between basic and non-basic. As seen in the Table the figures show the decline of basic employment in gold mining and the increasing 'basicness' of manufacturing industries between 1951 and 1963/64. It was at this point that the figures for the segregation of manufacturing employment, based on extra-regional exports, were checked against the results of the Input-Output survey (to be forwarded in Chapter 5), and found to be substantially correct.

From the totals of basic and non-basic employment,

/ base

Table 2

EAST RAND EMPLOYMENT DIVIDED INTO

BASIC & NON-BASIC ACTIVITIES

1951, 1960, 1963/64.

	<u>BASIC</u>		<u>1963/64</u>	<u>NON-BASIC</u>		<u>1963/64</u>
	<u>1951</u>	<u>1960</u>		<u>1951</u>	<u>1960</u>	
Agriculture	-	-	-	2,196	6,094	6,094
Mining	111,517	84,329	67,334	-	-	-
Manufacturing	-	-	-	967	1,314	2,030
Food	-	-	-	120	131	285
Textiles	-	18	-	690	1,344	1,123
Furniture	1,133	1,189	2,124	912	1,060	1,179
Paper	-	-	-	-	-	80
Rubber	-	-	-	-	-	200
Chemicals	-	-	-	1,289	1,603	1,648
Non-Metal Min.	-	1,492	1,781	2,733	2,847	3,588
Metal Prod's.	-	883	1,958	1,003	2,931	1,793
Machinery	-	-	4,053	-	786	1,065
Transport Equip.	-	1,079	1,481	335	579	600
Misc. Manufac.	137	-	-	3,695	3,187	3,187
Construction	-	-	-	858	1,120	1,120
Electricity	-	-	-	5927	7,142	7,142
Wholesale & Retail	-	-	-	650	2,641	2,641
Other Commerce	-	-	-	2329	3,153	3,153
Transport	-	-	-	22,568	20,666	20,666
Service	-	-	-	769	8,381	8,381
Other	-	-	-	-	-	-
Totals	<u>112,787</u>	<u>88,990</u>	<u>78,731</u>	<u>48,043</u>	<u>64,979</u>	<u>65,945</u>

Source : Extracted from statistics and location quotients derived in Appendix I.

base ratio patterns were constructed between ,basic,service, economically active,and total population,in the region by the method shown below :-

e.g. 1951

Basic : Non-Basic Ratio

Basic : Total Population Ratio

$$\frac{48,043}{112,787} = 1 : 0.42$$

$$\frac{190,713}{112,787} = 1 : 1.69$$

to give the Ratio Patterns shown in Table 10

TABLE 10

BASE RATIO PATTERNS

	<u>1951</u>	<u>1960</u>	<u>1963/64</u>
Basic : Non-Basic	0.42	0.73	0.84
Basic : Total Employment	1.42	1.73	1.84
Total Employment : Total Population	1.18	1.74	1.78
Basic : Total Population	1.69	3.02	3.27

Effects of the Transition on Non-Basic Activities. Base ratio theory assumes that changes in basic employment will lead to changes in other ratio elements, that will, in the long run, revert to the ratio relationship existing before the change in basic employment took place. It was this premise that led to the opinion expressed by both the National Resources Development Council and the Marginal Mines Research Unit (N.R.D.C., 1960 ; M.M.R.U., 1964), that service activity would decline absolutely with the decline in the basic activity of gold mining. In fact, as Table 9 shows, there is an apparent anomaly between the decline in basic employment and the increase in non-basic employment between 1951 and 1963/64. The explanation of this phenomenon was forwarded by Andrews in that,

" ...the

" ...the only way in which non-basic activities can permanently prevent a negative reaction is by a qualitative change in basic activity as it declines quantitatively."

This qualitative change in the East Rand is represented by the transition of the components of basic employment from gold mining to manufacturing industry (no other employment sector having a location quotient exceeding unity), with the higher average wage rates in manufacturing industry. Andrews continued that,

" ...this type of qualitative change in basic activity could also lead to a positive shift in service activities if the contrast in the local economies before and after were sufficiently dramatic. But a condition of this sort would be highly unusual." (Andrews, 1955(b))

It is exactly this "highly unusual condition" that has occurred in the East Rand. When the actual wages paid in basic activities are computed it is seen, in Table II, that, despite a fall in basic employment of 10,759 between 1960 and 1963/64, there has been an absolute increase in total wages paid (or, reduced to 1960 real wage index, only a very small decline, of less than 2%), as a result of an increase in non-gold mining basic employment of 6,756 from 4,641 to 11,397. It is this qualitative change in basic employment represented by the increase in basic employment in manufacturing industry that has led to the 'survival' of non-basic activities in the East Rand.

/ Table II

TABLE II

WAGES IN BASIC ACTIVITIES

R.	<u>White</u>		<u>Non-White</u>	
	<u>1960</u>	<u>1963/64</u>	<u>1960</u>	<u>1963/64</u>
Gold Mining	24,358,420	19,850,635	12,563,200	10,357,163
'Basic' Manufac.	2,678,513	7,843,155	1,335,579	3,631,113
	27,036,933	27,693,790	13,898,779	13,988,276

Wages paid in manufacturing taken as :-

$$\frac{\text{Basic wages in manufac.}}{\text{Total wages in manufac.}} : \frac{\text{Basic employ in manufac.}}{\text{Total employ in manufac.}}$$

Hence, total wages in Basic activities :-

<u>1960</u>	<u>1963/64</u>
R 40,935,712	R 41,682,066

If 1963/64 figure is amended to 1960 real wage index (taken from price indices with time-lag of one-year), which by 1963/64 had risen to 103.8, total wages paid were R 40,156,132.

Two other factors have increased the actual positive shift in non-basic activities. The first of these is as a result of the peculiar position of Bantu mine workers in the region. These mine workers are purely migratory labour, remitting most of their wages back to their families in the homelands. Hence their share of basic employment wages cannot be considered to have the same importance to the local economy as that of other groups. If Bantu mine workers

/ wages

wages are therefore subtracted from the totals, as in Table I2, it is seen that there was an absolute increase (at 1960 real wage levels), of over R 1½ million in the period between 1960 and 1963/64 in the wages of basic employees.

TABLE I2

WAGES IN BASIC ACTIVITIES
LESS NON-WHITE MINERS WAGES

R	<u>1960</u>	<u>1963/64</u>
Total Wages	40,935,712	40,156,132
Non-White Miners Wages	12,563,200	9,977,999
	28,372,512	30,178,133

At 1960 Real Wage levels

Hence, real increase in local basic wages 1960-1963/64
= R 1,805,621

Further, the second factor tending in this direction is the generally greater linkage of manufacturing industry to the non-basic activities, this fact, as will be seen in Chapter 5, having led to the growth of many non-basic activities serving them. With this greater linkage the ratio between basic and non-basic activities has been increasing, from 1 : 0.42 in 1951, to 1 : 0.84 in 1963/64, and is likely since 1963/64 to have exceeded unity, becoming more in line with ratios in industrial areas in the East Central Rand.

Effects of the Transition on Employment and Total Population

The change in the ratio of basic employment : total population has been even more dramatic, increasing from

/ 1 : 1.69

I : I.69 to I : 3.27, and reflects substantial changes in employment and population in what can be referred to as the mining and industrial phases. The period of the mining economic base represented a very large proportion of the economically active population, seen in the ratio for 1951 for Total Employment to Total Population of I : I.18. This was not only as a result of the high proportion of the total of Bantu mine workers, but also due to the large number of single white mine employees. This situation can be contrasted with that of 1963/64, representing the beginning of the industrial phase, with a ratio of I : I.78, a very large increase, mainly due to the new permanent Bantu labour force plus their families entering the region and replacing the Bantu mine workers.

These statistics however do not tell the whole story of the change in the actual structure of the community population, a story which can be divided into two parts, the changes resulting from the closure of the mines and, the build up of industry.

Closure of Gold Mines. The run-down in employment resulting from the closure of the gold mines has already been briefly outlined elsewhere. To what degree has this led to a problem of unemployment ?

Unlike many mining communities in other countries, e.g. South Wales, there have been few unemployment problems resulting from the closure of the gold mines. In respect of migrant Bantu mine workers no problems arose from the closure of the mines, as the Bantu mine worker normally only works on the mines for periods of nine months before returning to his homeland. Similarly, there have been few hindrances to migration for white mine workers. The controlling Mine Houses have had vacancies in their new mines opening in other areas, e.g. Union Corporation with

/ new

new mines opening in Evander at the same time as closures at Geduld and Van Dyk Gold Mines. Also, in contrast to South Wales mining villages, there has not been the close community structure in the East Rand, which acts as a force against migration. Admittedly, some white miners, due to their close linkages with the area, did decide to stay after closure, but these only form a small proportion of the earlier white employment in gold mining in the region.

Build up of Industry. The growth of industry in the East Rand has attracted into the area a virtually new labour force, replacing the mine workers. The Bantu influx, as already mentioned, was part of a general movement into the Witwatersrand and has expanded with the growth of industry (up until the introduction of the Physical Planning Act), necessitating the proclamation and extensions of Bantu locations to house these workers and their families. The white industrial labour force has been derived from three sources. Firstly, from existing service and mine labour in the locality. Secondly, from an outward movement from Johannesburg, and lastly, from inward migration from other regions and especially overseas. This led to a cosmopolitan white population with a large number of Southern Europeans present in the region.

Many firms moving into the area have brought workers or management with them. The best example is the Italian firm of Powerlines, who established themselves in Nigel in the late 1950's. Being largely staffed by Italians (over 90% of 1000 white employees), they have added a new dimension to the Nigel community in the local football team the firm created, which to many South Africans has given Nigel a new importance. Other instances are perhaps less obvious, but the appearance of many English subsidiary firms, especially in the fields of steel and brass, has led to the English, North country and Sheffield dialects becoming

/ commonplace

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