

4/WE123 16 (401)

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**March  
1963**

SOUTH AFRICAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

# **A Statistical Study of Manpower in the Building Industry**

**A . J E N S E N**

**NATIONAL INSTITUTE FOR PERSONNEL RESEARCH**

001.3072068 CSIR NIPR C/P/1

PB 027182

U.D.C. 658.3.024.4 : [ 658.3-057.2 : 69 ] ( 680 )



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NATIONAL INSTITUTE FOR PERSONNEL RESEARCH.

C.S.I.R. CONTRACT REPORT C.G. 76.

This study was planned by R.S. Hall, F.A. Verwey and A. Jensen.

The data relating to apprentices in the Building Industry, and some of the data relating to artisans, were collected by H. Theo, M. Jekiel, G. Saayman and A. Jensen. R.S. Hall and A. Jensen, assisted by the Mathematical Statistics Division of the National Institute for Personnel Research, were responsible for the analysis and treatment of the data. The computer programmes were written by R.S. Hall and C.M. Elder.

The following members of the Institute's staff were also associated with the study, or with the preparation of the report: B. von Mayer, S.R. Meyerowitz, C.R. Thomson and J.M. Bester.

We wish to express our appreciation of the willing co-operation of Mr. G. de C. Malherbe, Director of the National Federation of Building Trade Employers in S.A., Mr. T.J. Marchand, General Secretary of the Industrial Council for the Building Industry (Witwatersrand), and his staff, Mr. Cronjé, Secretary of the Pretoria branch of the Council, and the Department of Labour staff who made possible the collection of the data covering apprentices.

This report embodies an analysis of artisan and apprentice manpower in the Building Industry: it covers the Wits.-Pta. region for the period 1955 - 1961, in the case of artisans, and the Republic as a whole, for the period 1951 - 1961, in the case of apprentices. The survey was carried out on behalf of the National Federation of Building Trade Employers in South Africa, and was financed by the National Development Fund for the Building Industry.

The aim of the analysis is to show labour trends and group differences, where they exist, with respect to the variables studied: year, area, age, trade, race, education, annual employment, and wastage. The implications and significance of the findings will be discussed as the results of the analysis are enumerated. However, a summary of these findings precedes the body of the report.

Note: This report supercedes and cancels all information contained in the interim report on the survey, submitted to the N.F.B.T.E. in October 1962.

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## SUMMARY OF FINDINGS

(N.B. All statements regarding artisan manpower relate to artisans employed in Wits.-Pta. region only.)

### I. ARTISANS

1. The number of artisans on the records of the Industrial Council for the Building Industry (Wits.-Pta. region) in 1961, was 21,320. Of these, 58% (12,463 artisans) were employed, in 1961, in the private contracting sector of the region, working more than 5 weeks in the year.
2. The annual net increase of artisans over the period 1956 - 1961 was in the region of 700 to 800 men per annum. Apart from a marked drop in 1961 to 280 men, the annual net increase did not show severe fluctuations.
3. The annual recruitment to the Industry (apprentices qualifying as artisans, immigrants and artisans entering the Wits.-Pta. region from other areas or from the public sector) amounted to approximately 7%.
4. Wastage through deaths and withdrawals from the private sector of the Industry was about 3% annually. Thus the net increase of recruits is roughly 4% annually.
5. The recruitment trend shown is not an upward one and is indicative of a relatively static Industry in terms of manpower growth.
6. The average number of weeks worked by artisans in the region remained relatively constant over the period, fluctuating between approximately 27 and 31 weeks. Thus, on the average, over the period 1955 - 1961, about 20 weeks per man year were not used by the private contracting Industry in the region.
7. The hard core of the artisan labour force, those men who worked, on the average, more than 80% of the year over the seven year period, comprised only 27% of the total force. Those who worked for more than half the year comprised 58% of the force.

8. Two thirds of the men on the records of the Industrial Council were employed for about  $\frac{3}{5}$  of the time, on the average, over the period studied. If men likely to have left the area or the Industry are excluded, the labour utilization in a typical year, 1960, was approximately 65% of a potential of almost 15,200 man years.
9. Public bodies in the area employed a total of 2,440 men in 1961, or just over 11% of the 1961 private sector manpower total.
10. Building activity in the private contracting sector of the Industry in the Wits.-Pta. region, since 1958, has not maintained the rate of increase observed in the preceding period.
11. Building activity in the region since 1955 has shown virtually a constant trend with little increase up to 1960 and a marked decrease in 1961.
12. Age does not appear to act as a clear-cut selective factor in the employment of artisans.
13. The proportion of younger men in the working force appears to be satisfactory: 55% of the effective Wits.-Pta. building artisan population are between the ages of 25 and 44.
14. The chief trades, in order of population magnitude are: Woodworkers (33%); Bricklayers (30%); Plasterers (12%); Painters (12%); Plumbers (6%). These trades comprise 93% of the building artisan population (private contracting sector) in the region.
15. Masons have a consistently higher and Metalworkers a consistently lower average of weeks worked in the year than any other trade, (35 and 20 weeks respectively). Amongst the chief trades, the averages of Bricklayers and Painters are both approximately three man weeks lower than the average of the other three trades, Plumbers, Plasterers and Woodworkers (29 weeks each).
16. Of the five main trades, the Plumbers are a younger group than the others with an average age of 34 years as against an average of 38 years for all other trades.

17. The increase of men, taking all trades, was 32% over the 7 year period. Bricklayers were considerably below this figure with 20%; Plumbers were considerably above it with 72%. The percentages for the other major trades were: Woodworkers: 41%; Plasterers: 40%; Painters: 33%.

## II APPRENTICES.

18. Of the building trade apprentices registering to qualify between 1954 and 1966 in the Republic, 32% were recruited in the Witwatersrand area, 20% in Cape Town, 14% in Durban, 12% in Pretoria, 9% in Port Elizabeth, 4% in Pietermaritzburg, 3% in East London, and 3% in Bloemfontein. Recruitment in other centres was, in each case, about or less than 1% of the total.
19. The ratios of apprentices to the value of building plans passed for the various centres between 1951 and 1960 show Port Elizabeth and Pietermaritzburg to have high ratios (18 and 17 apprentices per million rand plan value, respectively), and Bloemfontein, the Witwatersrand and Kimberley to have low ratios (8, 8 and 6 respectively.) The ratios for the other main centres are: Pretoria, 13; East London, 13; Cape Town, 11; and Durban, 10).
20. Ninety-four percent of apprentices fall between the educational range, standards 6 to 8; 46% have only a standard 6 qualification. Only about 2½% of these building trade apprentices go beyond standard 8 and just over 1% have technical qualifications (N.T.C. I - II). This is seriously out of line with the educational levels obtaining in the country as a whole where approximately 22% of the public high school population proceed beyond standard 8. This augurs badly for the development of managerial personnel within the Building Industry.
21. Most apprentices in the Building Industry (85%) begin their apprenticeship between the ages of 17 and 20.
22. Apprentices in the Woodworking trades comprise 35% and those in the "wet" trades, Bricklaying and Plastering, 20% of the sample studied. The other main trades are: Electrical-wiremen: 12½%; Plumbers: 12%; Painters: 8%.

23. Bricklaying and Plastering appear to be unpopular trades, in terms of the difference between the proportion of artisans in the trade and the proportion of apprentices contracting for the trade. The Woodworking trades are adequately served in relation to existing artisan numbers, while the more technical trades, Plumbing and Electrical-wiring are popular, i.e. the proportion of apprentices they are receiving is in excess (16%) of the present proportion of artisans in these trades. However, recruitment to these two trades is not on the increase and shows only a relatively steady trend.
24. There are negligible differences between the trades with respect to standard of education and age at time of contracting, except for a slightly higher standard of education amongst Electrical apprentices.
25. Wastage, in the form of contracts cancelled before full term, amounts to about 22% over the period studied. The Plastering and Bricklaying trades show high wastage rates (29% and 26% respectively) while the Plumbing and Electrical wiring trades show a comparatively low wastage (17% and 16%). The wastage rate for Coloureds (14%) is considerably lower than that for Whites (24%). With regard to geographical area, the lowest wastage rate is found in the Western Cape Province (12%) and the highest in the Transvaal (26%); the other areas have similar wastage figures: Eastern Cape: 20%; O.F.S.: 22% and Natal 21%.
26. The apprentice pass rates on trade tests for the period 1954-61 are low. The pass rates for the major trades recorded by the C.O.T.T. are as follows: Painters: 39%; Bricklayers: 26%; Carpenters: 26%; Plumbers: 22%. The overall pass rate for the period was 27%.
27. Recruitment trends show the lack of a popular and growing Industry in terms of apprentice recruitment. This is particularly true of the Transvaal where recent annual recruitment is below the 3% minimum of the artisan force lost through deaths and withdrawals from the Industry or area. Also, wastage in the Transvaal is high.

III RECOMMENDATIONS

28. On the basis of the findings it is recommended that:
- (i) record-keeping by local Industrial Councils be improved;
  - (ii) employment of artisans be controlled and locally centralized;
  - (iii) steps be taken to attract more apprentices to the Building Industry, particularly in the Transvaal.
  - (iv) consideration be given to encouraging more Coloureds to join the Bricklaying and Plastering trades, in view of the unpopularity of these trades amongst Whites and of the relatively low wastage rate amongst Coloured apprentices;
  - (v) steps be taken to raise the trade test pass rate amongst apprentices or, at any rate, to ensure that the low pass rate does not reflect practical incompetence;
  - (vi) apprentices be encouraged to obtain higher educational and particularly technical, qualifications so that the individual development of the artisan in the Industry may be promoted; alternatively, it may be necessary to encourage youths of higher ability than that of past apprentices (judging by education and the test pass rate) to join the Industry.

S E C T I O N - - IARTISAN MANPOWER IN THE WITS.-PTA. REGIONGross Manpower.TABLE I

Number of Men on the Records of the Industrial Council, Wits.-Pta. Region, 1955 - 1961.

Year.	1955	1956	1957	1958	1959	1960	1961
a. All Men	16119	17333	18394	19632	20374	21042	21320
b. Recruits	1696	1223	1099	1416	1147	1357	878
c. Men working more than 5wks in a year	13164	13675	13503	13833	13642	13957	12463

Table I shows the number of men listed by the Industrial Council for each year of the period 1955 - 1961, in three categories:

a. All Artisans, which includes men who may have left the area and/or the Industry for a period and is therefore only a rough indication of manpower resources. Deaths and withdrawals prior to any year are not included in the figures for that year. However, withdrawals by artisans registered with the Pretoria offices of the Industrial Council were obtained in full for the years 1958 - 1960 only and the distribution of deaths indicates that these figures are also deficient for the earlier years of the period. It is likely, therefore that the figures in Table I are deficient to the extent of approximately 3% for the years 1955 - 1957, estimated on wastage figures for the period 1958 - 1960. This is a relatively small error and does not affect to any appreciable extent the gross manpower totals over the period.

The net annual increase in artisan numbers is affected by this error and cannot be obtained by successive subtraction of a year's figures from that of the following year. Table 2 thus gives estimates of the net annual artisan increase for the years 1956 - 1958. The figures for 1959 - 1961 are more or less accurate.

GRAPH I. Recruits (all sources) to the Wits.-Pta. Private Sector. 1955 - 1961.

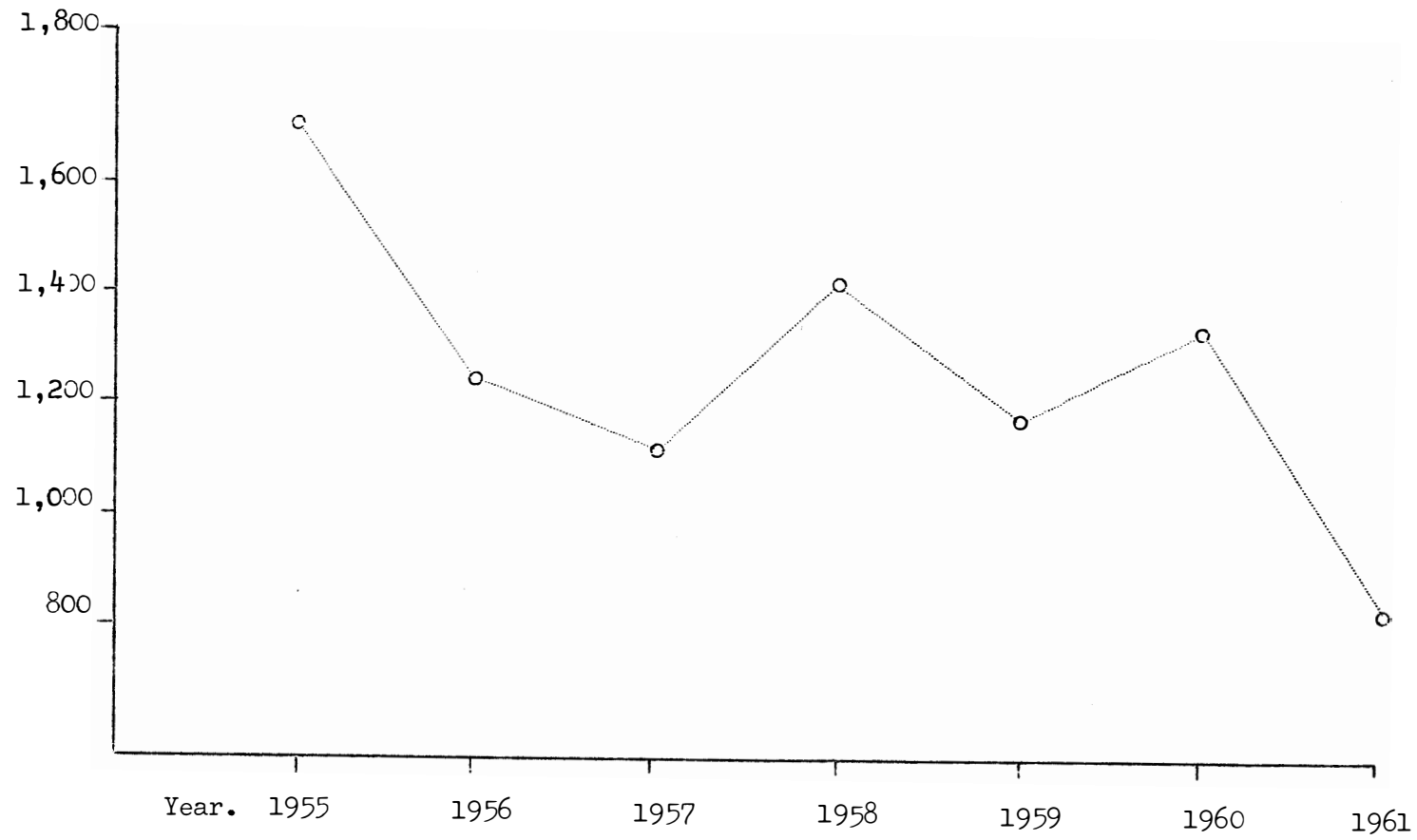




TABLE 2.

Net Annual Increase in Artisan Numbers : Wits.-Pta.  
Region, 1956 - 1961

Year.	Estimate 1956	Estimate 1957	Estimate 1958	1959	1960	1961
Net Increase	810	670	930	740	670	280

Thus, apart from the marked drop in 1961, the annual net increase does not show severe fluctuations and would be in line with the estimated required annual increase of 700 man years per annum (Industrial Economics Division of the C.S.I.R. - separate report on labour requirements in the Building Industry) if all recruits worked a full man year, which is not the case (see Table 3,P.10).

b. Recruits (see Graph I, p 7). These are men who have no work record with the Industrial Council prior to 1955 and include qualifying apprentices, immigrants and artisans entering the Wits.-Pta. region from other areas or from the public sector (Mines, P.W.D., Municipalities etc.) The annual recruitment from all these sources is thus in the region of 7%. If wastage amounts to about 3% of the annual manpower total, the net increase is roughly 4% annually. This, of course, was not true for the recessive year 1961. It must be stressed that these estimates are only rough - there are insufficient data on wastage to permit greater accuracy.

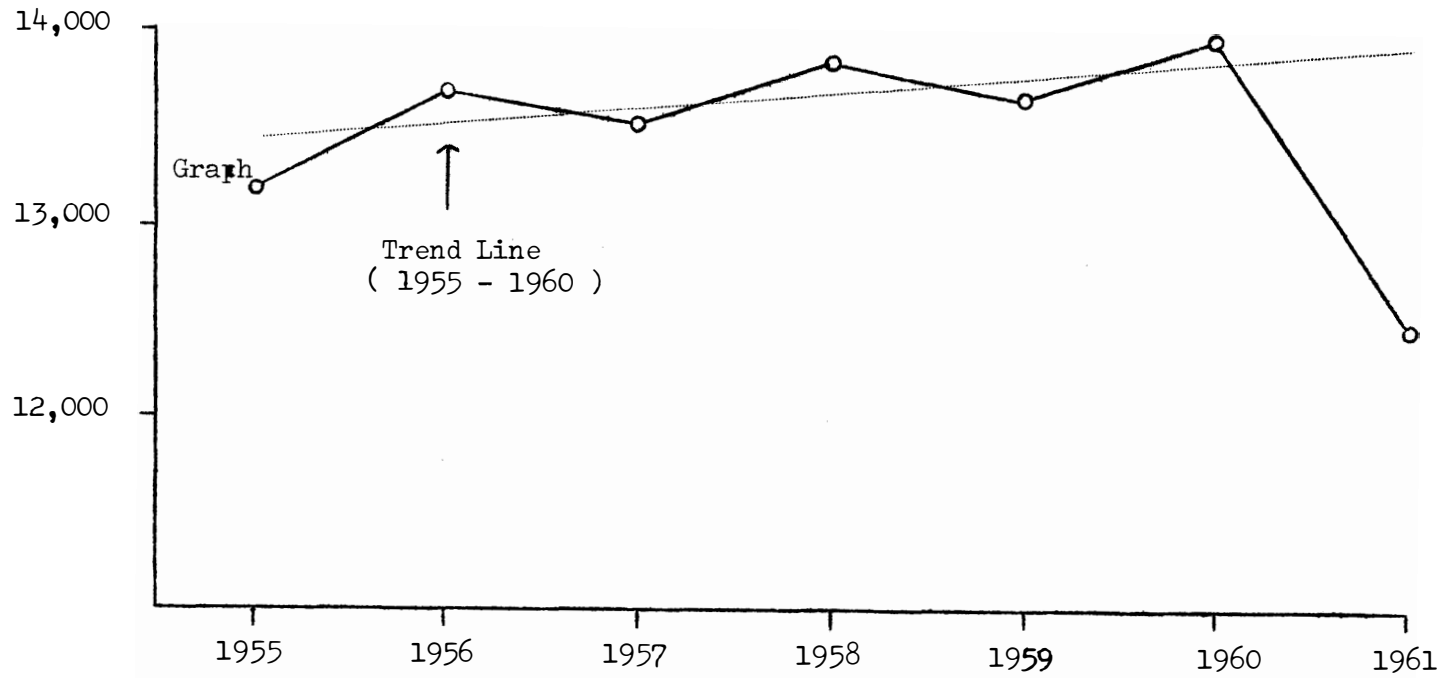
However, it is important to note that the recruitment trend is not an upward one and is indicative of a relatively static industry in terms of manpower growth.

c. Number of Artisans Working more than Five Weeks. The information in the second part of Table I indicates that the actual working force in the area is relatively constant. The accompanying graph (Graph II, p 9) shows the trend.

Thus, excluding the recessive year 1961, the working artisan force shows a very gradual trend upwards over the period 1955 - 1960. However, since these figures are not strictly related to work performed, the following information, showing the man-weeks worked over the period, should be taken into account.

GRAPH II     Building Artisans working more than 5 weeks per year, shown annually  
for the period 1955 - 1961 - Wits.-Pta. Areas Combined.

ARTISANS



Labour.TABLE 3.

Total and Average Weeks Worked in the Building Industry - Wits.-Pta. Region, Period 1955 - 1961

Year	1955	1956	1957	1958	1959	1960	1961
Total Man-weeks	501,615	508,568	483,918	512,340	496,532	513,710	445,287
Average Man-weeks.	31.12	29.97	27.43	29.15	29.37	32.44	27.63

These averages are relatively constant and it is worth noting that the figure for 1961 (27.63 man weeks) compares very closely with that for 1957 (27.43 man weeks). A feature of these results is the apparent lack of full/manpower utilization in the private contracting sector of the area. The nature of the original data is such that it is impossible to determine whether a man worked outside the area for the period of his apparent unemployment or whether he suffered total or part unemployment. Also, an artisan might have remained in the region and obtained employment in building operations in the public sector instead of in the private contracting sector. However, the conclusion to be drawn is that, on the average, over the period 1955 - 1961, approximately 20 weeks per man year were not used by the private contracting sector of the Industry within the Wits.-Pta. region.

The following table, showing the proportions according to the percentage of time worked, gives further information on labour utilization:

TABLE 4.

Distribution of Men (Converted to Percentages) According to Percentage of time worked (Average Number of Weeks Worked per Year as a Percentage of 50 weeks) Wits.-Pta. Region : 1955 - 1961

% of Time	0 - 20% (0 - 10 wks)	20 - 50% (10 - 25 wks)	50 - 80% (25 - 40 wks)	80 - 100% (40 - 50 wks)
% of Men	13.9%	28.0%	30.9%	27.2%

Thus the hard core of the artisan labour force, those men who work, on the average, more than 80% of the year over the period

1955 - 1961, comprises only 27% of the total; and those who work for more than half the year comprise 58% as against 42% who work for less than half the year, on the average.

The position may be stated in another way: in a fairly typical and recent year such as 1960, a labour pool of approximately 21,000 men was shown on the records of the Industrial Council, of these a small proportion, about 3%, died or surrendered, leaving a total of about 20,500 artisans; of this remaining total just under 14,000 worked in the Wits.-Pta. region for some period. Unknown proportions of the remaining 6,500 men were employed outside the region or unemployed altogether or they were employed in the area but not in the private contracting sector. This latter proportion (6,500 men) is about one third of the total. The 14,000 who worked for some period in the area and were contractor employed, realised an average of about 32 weeks in the year. Thus the same amount of work could have been done by just under 10,000 men employed for the full year. The labour utilization by the private contracting sector for the year 1960 was thus slightly less than 50% of the theoretical potential of 20,500 man years in the Wits.-Pta. region.

However, this total potential is inflated by the inclusion of men who have not worked in the private contracting sector in the area for two years or more (without having surrendered) and it is likely that these men have left the area or the Industry for an indefinite period. They should not, therefore, be definitely counted as part of the readily available manpower potential. In 1961 just under 25% (5,200 artisans) of the men shown on the books of the Industrial Council had no working record for 2 years or more. In 1959 this percentage was 22% (4,466 artisans).

If these men are not regarded as part of the labour potential, then the artisan labour utilization in 1960 was approximately 65% of a potential of just on 15,200 man years, taking artisan numbers and weeks worked into account.

In the years 1959, the percentage of men who worked less than 5 weeks in the year but who did have a working record for at least one of the two previous years was 19% (3,263 men) of the assumedly readily available manpower potential of 16,908 artisans. For 1961 the corresponding figures are 18% (2,955 men) and 16,120 artisans. These figures give an overall estimate of unemployment, in the area and/or Industry in terms of men for the two years. (Calculations for earlier years would

be less reliable since the data worked on cover the years 1955 - 1961 only and hence the proportion of men without a record of work for 2 or more years decreases for the earlier years of the period.)

Of course, the low labour utilization may be due to the fact that a large proportion of men is not available to the Industry because they have left the area and / or Industry (private sector) temporarily. The information does not permit any estimate in this regard. However, it is worth mentioning here that in 1961, the following public bodies employed a total of 2,440 men or just over 11% of the 1961 private sector manpower total : Chamber of Mines, P.W.D., Johannesburg and Pretoria Municipalities, S.A.R., Transvaal Provincial Administration (artisans in Wits.-Pta. region only included). Thus these bodies could not account for more than a very small percentage of the man-years not worked by building artisans in the private sector of the region, since most of them have a fair proportion of relatively permanent employees.

Supply and Estimated Demand.

On converting the annual man-week totals over the period into man-years, the observable trend may be compared with the future trend in the artisan labour requirements in the Building Industry, computed by the Industrial Economics Division of the C.S.I.R. (Separate report).

TABLE 5.

Total man-years Worked : Building Industry :  
Wits.-Pta. Region - 1955 - 1961

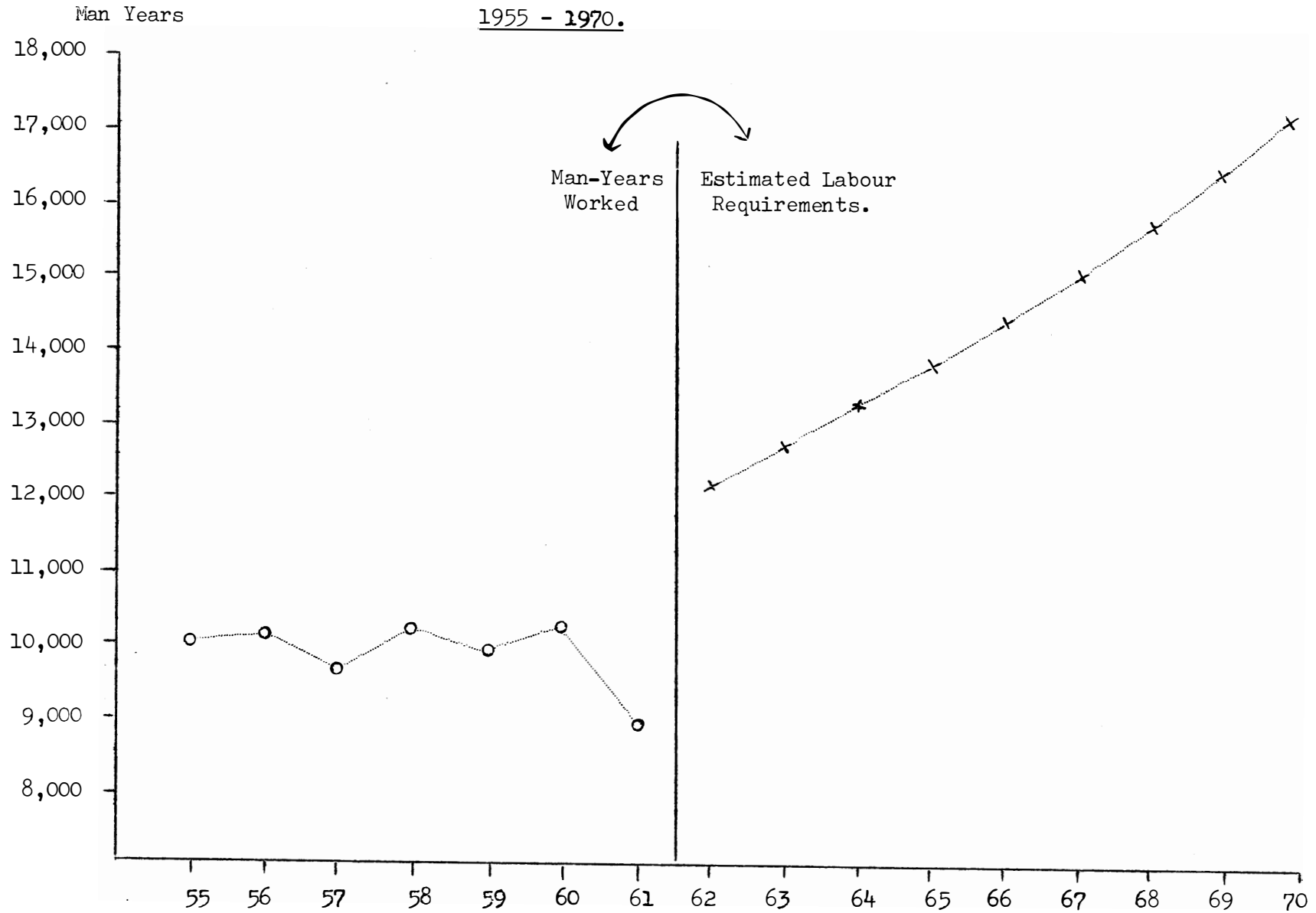
Year	1955	1956	1957	1958	1959	1960	1961
Man Years	10,032	10,171	9,678	10,247	9,931	10,274	8,906

TABLE 6. (a)

Estimates of Skilled Building Labour Requirements:  
Wits.-Pta. Region - 1962 - 1970

Year	1962	1963	1964	1965	1966	1967	1968	1969	1970
Man Years*	12,200	12,700	13,300	13,800	14,400	15,000	15,700	16,400	17,100

GRAPH III.      Comparison of Actual Man-Years worked and Estimated Labour  
Requirements in Man-Years: Building Industry: Wits.-Pta. Region.



The discrepancy between the end of the realised labour graph and the beginning of the estimated labour requirement trend is not significant for the comparison of trends. The report of the Industrial Economics Division of the C.S.I.R. states that:

"It is very probable that the estimates .... for the year 1962 are significantly higher than is warranted by the circumstances actually pertaining at present. This is due to the fact that the situation in the Building Industry during the last two years was much less favourable than it was during the period on which the estimates are based (1952 - '59)".

The conclusions to be drawn from the comparison may be stated as follows: the building activity in the Wits.-Pta region since 1958 has not maintained the increase to be expected on the basis of the amount of regional and national activity obtaining before this date. Further, building activity in the region since 1955 has shown virtually a constant trend with little increase up to 1960 and a marked decrease in 1961. If the development shown in the period up to 1958 is to be maintained, a sharp increase in building activity in the Wits.-Pta. region will be necessary. If the general trend shown over the period 1955 - 1961 is continued over the next 10 years, artisan labour utilization will remain for this future period at much the same level as over the last seven years.

Since the data show that only  $\frac{2}{3}$  of the men on the records of the Industrial Council are employed for about  $\frac{3}{5}$  of the time (on the average) it may be that the artisans are not in fact available for the remaining time because of employment elsewhere, in which case future expansion in the private sector of the Building Industry would be seriously hampered and the estimated trend shown in Graph III would be far from realised.

#### Age Groups.

The following table was computed by selecting age groups from the artisan population so that the average ages of the groups were equally spaced (10 year intervals) and representative of the period under study and not just of a particular year, and then computing the mean number of weeks worked over the period by these age groups.

TABLE 6.(b)Mean Number of Weeks Worked in a Year by Age Groups.

Group.	Age Range Born between:	Average Age (approx)	Mean Weeks Worked
1	1925 - 1935	25	29.3
2	1915 - 1925	35	29.8
3	1905 - 1915	45	30.3
4	1895 - 1905	55	31.0
5	1885 - 1895	65	31.1

A comparison of the means (weeks worked) of these age groups shows only small differences between any of them although there is a slight tendency for the older man to work more than the younger. Thus overall employment is not directly related to age. This does not mean that the age groups are equally represented in the working artisan population, but that age does not appear to act as a clear-cut selective factor in employment. However, when comparing the average age in 1961 of the group of artisans who worked 5 weeks or more in the year with those who worked less than 5 weeks, the latter group has a considerably higher average, 43.0 years as against 36.5 years for the former. This does not contradict the statement that age is not directly related to overall employment, since the range above the 5 week level is 90% of the maximum. The conclusion is that it is the older man who suffers almost total unemployment or who works outside the private contracting sector of the Building Industry and/or Wits.-Pta region. The same finding holds for years prior to 1961 and for all trades. The age distribution, as at the end of 1961 and excluding those who had no working record for 2 or more years at this date, was as follows:



TABLE 7

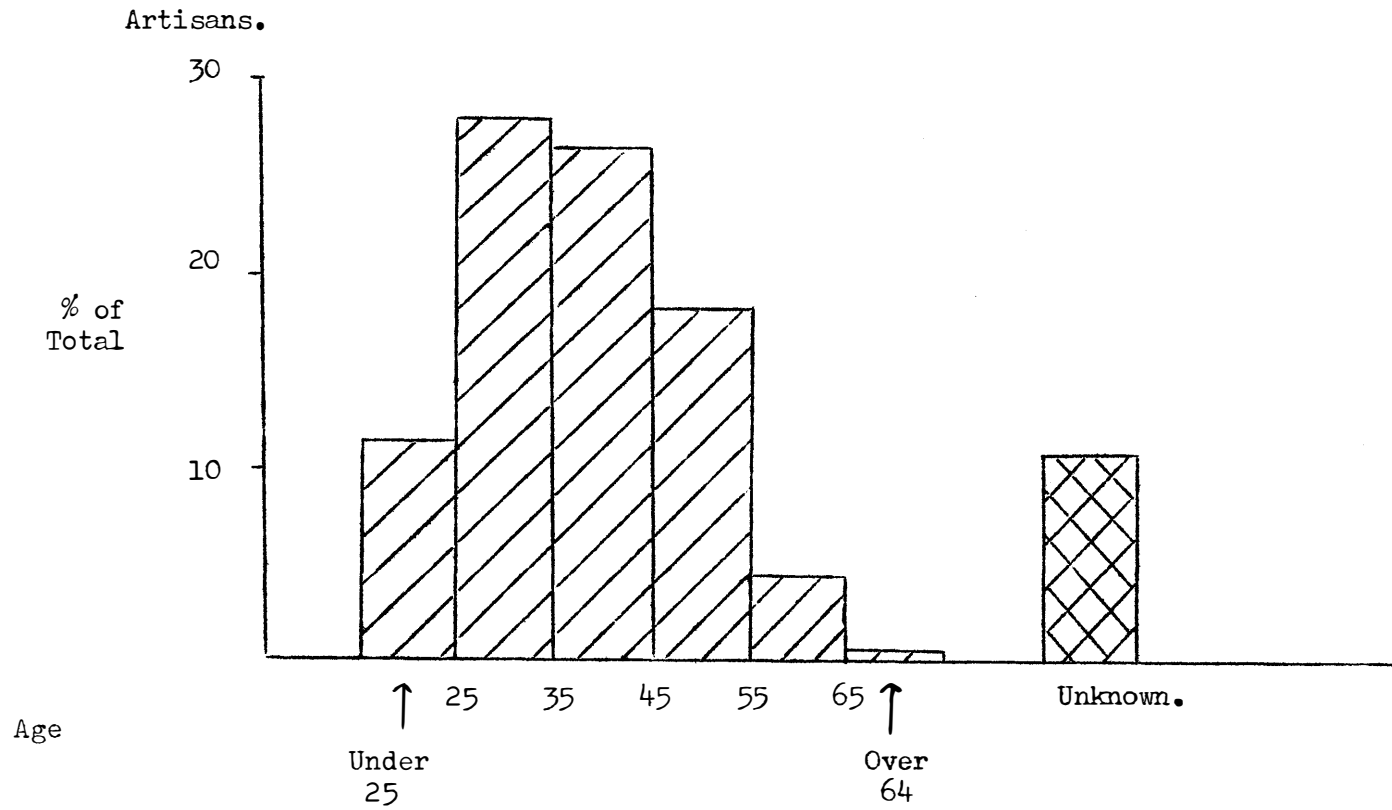
Age Distribution : Building Artisans,  
Wits.-Pta Region - 1961

Age Group	Artisans	% of Total
Under 25	1824	11.3
25 - 34	4551	28.3
35 - 44	4254	26.5
45 - 54	2931	18.2
55 - 64	707	4.4
Over 64	136	.8
Unknown	<u>1717</u>	10.6
	16120	

The accompanying histogram (see Graph IV, p 17) shows the distribution graphically.

Thus men between the ages of 25 and 44 comprise about 55% of the effective Wits.-Pta. building artisan population and the overall average is 37.70 years. However, this is probably an under-estimate since for nearly 11% of the comparatively stable force of 16,120 men, ages are unknown. From the nature of the records, it appears likely that these are older men who registered with the Industrial Council before the recording of data was as methodical and reliable as it is at present. This would also explain the sudden drop in the distribution from 18.2% for the 45 - 54 group to 4.4% for the 55 - 64 group. The proportion of younger men in the working force appears to be satisfactory.

GRAPH IV Age Distribution : Building Artisans, Wits.-Pta. Region, 1961.



Trades.

The designated building trades in this survey are as follows:

- (i) Bricklayers;
- (ii) Plasterers (including Wall Tilers);
- (iii) Plumbers;
- (iv) Painters (including Glaziers);
- (v) Woodworkers (including Carpenters, Shopfitters, Joiners and Machinists);
- (vi) Asphalters (including Water-proofers);
- (vii) Masons;
- (viii) Metal Workers (including Welders, Steel Erectors etc.);
- (ix) Miscellaneous (including Floorlayers, French Polishers, Scaffold Erectors, Handymen, etc).

This categorization, used by the Industrial Council for the Building Industry, is adequate although somewhat coarse. The Department of Labour now distinguishes 22 distinct building trades in their registration of apprenticeship contracts.

The number of men, according to trade, shown on the records of the Wits.-Pta. Industrial Council at the end of 1961 is as follows: (this includes men who have not had a working record for 2 or more years at this date, but excludes deaths and surrenders prior to 1961):

TABLE 8.

Number and Percentage of Building Artisans by Trade  
Wits.-Pta. Region - 1961.

Trade.	No.	% (to the nearest 1%)
Bricklayers	6279	30
Plasterers	2570	12
Plumbers	1265	6
Painters	2631	12
Woodworkers	7053	33
Asphalters	94	Less than $\frac{1}{2}\%$
Masons	327	2
Metal Workers	179	1
Miscellaneous	513	2

The chief trades, in order of population magnitude are thus:

Woodworkers	33%
Bricklayers	30%
Plasterers	12%
Painters	12%
Plumbers	6%

These trades comprise 93% of the building artisan population (private contracting sector) in the Wits.-Pta. region. The other trades will therefore be omitted from some of the following comparisons.

Comparing these trades on employment in the area, over the period 1955 - 1961, the above proportions have remained relatively constant:

TABLE 9.

Percentage of Men Working More than 5 Weeks per Annum,  
By Trade, Wits.-Pta. Region 1955 - 1961.

Trade	1955	1956	1957	1958	1959	1960	1961
Bricklayers	32%	31%	30%	31%	30%	31%	30%
Plasterers	12%	12%	12%	12%	13%	13%	14%
Plumbers	5%	5%	5%	5%	5%	5%	5%
Painters	12%	12%	12%	12%	13%	13%	13%
Woodworkers	32%	32%	34%	33%	33%	33%	33%

The average man - weeks worked by each trade in each of the last 3 years is shown in the table below (1959 is a typical year, 1960 is somewhat above, and 1961 below average):

TABLE 10

Average Man Weeks Worked by Trades  
Wits.-Pta. Region 1959 - 1961 (To Nearest Week).

Trade	1959	1960	1961
Bricklayers	28	31	25
Plasterers	32	34	29
Plumbers	31	33	29
Painters	28	31	26
Woodworkers	31	34	29
Asphalters	32	32	24
Masons	36	37	35
Metal Workers	26	26	20

Masons have a consistently higher average and Metalworkers a consistently lower average than any other trade, but these are minority trades and the differences between the 5 main trades are not great. Obtaining a grand average of man - weeks worked for each trade over the whole period 1955 - 1961, the trades rank as follows:

TABLE 11

Overall Building Trade Averages of Weeks Worked  
Wits.-Pta. Region : 1955 - 1961

Rank	Trade	Average (man-weeks)
1	Masons	36.15
2	Plumbers	31.41
3	Plasterers	31.26
4	Woodworkers	31.20
5	Asphalters	30.84
6	Miscellaneous	30.42
7	Bricklayers	28.08
8	Painters	28.01
9	Metalworkers	26.98

There are very small differences over ranks 2 to 6, but the Masons' average (36.15) which is considerably higher than any other, is noteworthy. They are, however, a minority trade (2% of the total force). Amongst the chief trades, the averages of Bricklayers and Painters are both approximately 3 man weeks lower than the average of the other three trades, Plumbers Plasterers and Woodworkers.

The same pattern appears when one compares the chief trades with regard to the hard working core of artisans who have worked, on the average, between 80 and 100 percent of the time - an average of 40 - 50 weeks per annum over the period 1955 - 1961. Thirty-two percent of the Plumbers, 31% of the Plasterers and 31% of the Woodworkers fall into this category, but only 25% of the Painters and 23% of the Bricklayers are in the hard working core.

The trades are compared with regard to age in the following table.

TABLE 12

Average Ages : Building Trades : Wits.-Pta. Region 1961.

Trade	Average Age (1961) Years.
Masons	40.0
Unknown	39.8
Bricklayers	38.1
Plasterers	38.1
Woodworkers	37.7
Asphalters	37.5
Painters	37.4
Metalworkers	36.9
Miscellaneous	34.9
Plumbers	34.4

Of the five main trades, the Plumbers are a conspicuously younger group than the others.

Net Increase.

Calculating the total and percent increase of men in each trade over the period 1956 - 1961, yields the following table:

TABLE 13

Net Increase By Trade 1955 - 1961 Wits.-Pta. Region.

Trade	1955 Total	1961 Total	Total Recruitment	% Increase over 7 years.
Bricklayers	5230	6279	1049	20%
Plasterers	1918	2570	652	40%
Plumbers	734	1265	531	72%
Painters	1975	2631	656	33%
Woodworkers	5001	7053	2052	41%
Asphalters	57	94	37	65%
Masons	246	327	81	33%
Metalworkers	74	179	105	141%
Miscellaneous	301	513	212	70%
All Trades	16119	21224	5105	32%

Thus among the majority trades, the percent recruitment of Plumbers (72%) was considerably higher than in any other majority trade, and recruitment of Bricklayers (20%) was considerably lower than all other majority trades. Amongst the minority trades, the recruitment in the Metalworking trade of 141% is noteworthy.

SECTION IIAPPRENTICES IN THE BUILDING INDUSTRY.Data.

The data for this study were obtained from the records of the Government Department of Labour and relate to some 13,750 apprentices who registered contracts in the Building Industry between 1949 and 1961. This is not the total number of registrations between these dates; the criterion of inclusion in the sample was: completion, expected completion, or cancellation of contract between 1954 and 1965, inclusive. The following information was obtained for most of the apprentices included in the sample: age at date of registration; trade; year of registration; year of completion or expected completion; year of cancellation of contract where applicable; race; educational standard and centre. Race was not recorded in contracts before 1956; there were a number of omissions in other categories, e.g. education and age, and not all 1961 contracts had been submitted to the Department of Labour at the time the data were collected - the shortfall for 1961 (2.4% of the total sample) was ascertained subsequently and corrections have been applied. Information contained in the report on the 1959 manpower survey of the Department of Labour and additional data obtained from the Central Organization for Trade Testing will also be considered in this report.

From figures supplied by the Department of Labour relating to apprentice contracts since 1956, it has been calculated that there is a 2% discrepancy between these figures and those collected by the N.I.P.R., for this period. It may be assumed that this reflects roughly a 2% error on either side and may be ascribed to clerical inaccuracies in assembling the data. This error is relatively small and will not have a marked effect on the results. The greatest discrepancy between the Department of Labour data and those collected by the National Institute for Personnel Research is in the recruitment figures for the year 1956; totals of 1138 (D.L.) as against 856 (N.I.P.R.). However, this difference is balanced out by a reversed difference in later years. The general recruitment trend is not affected by these differences. Since the source of data was the same in either case, it is likely that a different date classification is the origin of the discrepancies.



Centres.

The following centres of apprentice registration within the Republic were included: Albany, Bloemfontein, Cape Town, Durban, East London, Johannesburg, Kimberley, Kroonstad, Pietermaritzburg, Port Elizabeth, Pretoria, Queenstown and Worcester. Contracts registered in Welkom date from 1957 and amount to only 64 contracts between 1957 and 1960. These have been omitted from most of the computations, since the small numbers and short period of registration does not afford a meaningful comparison with other centres. The number of apprentices recorded for each centre and the contributory percentages to the sample are shown in Table 14.

TABLE 14

Table 14 Apprentices in the  
Building Industry by Centre : 1949 - 1961

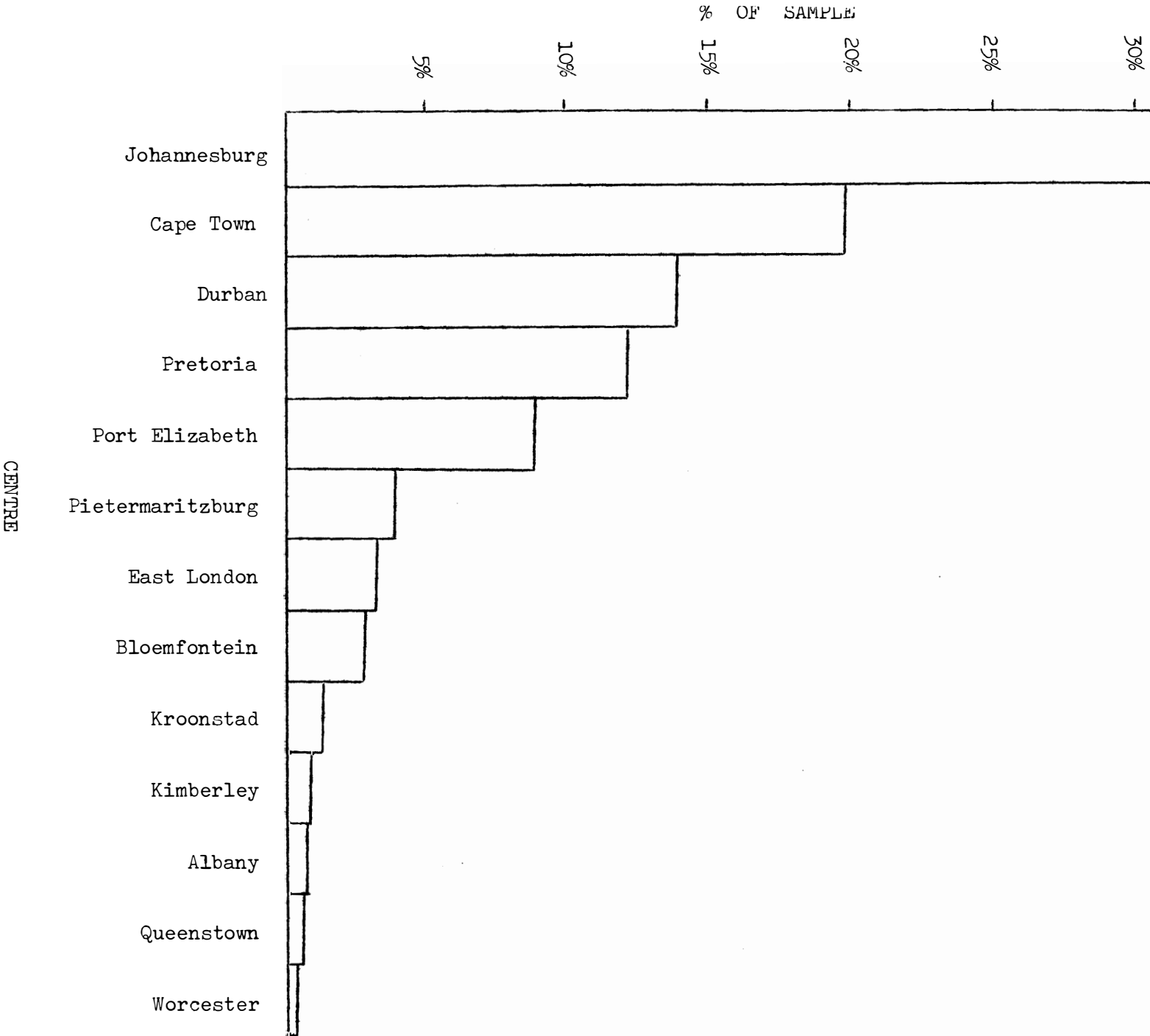
( See Graph V )

Centre.	Apprentices	% of Sample
Johannesburg	4,226	31.5
Cape Town	2,638	19.7
Durban	1,853	13.8
Pretoria	1,633	12.2
Port Elizabeth	1,191	8.9
Pietermaritzburg	520	3.9
East London	434	3.2
Bloemfontein	374	2.8
Kroonstad	174	1.3
Kimberley	125	.9
Albany	105	.8
Queenstown	92	.7
Worcester	59	.4
TOTAL	13,424	100.0%

The apprentice numbers themselves do not reflect exact apprentice strength over a particular period since they include

Apprentices in the Building Industry by Centre :

1949 - 1961



cancellations, and the total is 2.4% short of the true total as in 1961, of expected qualifiers after 1954 plus cancellations. However, with such a large sample, the proportions registering by centre can be regarded as a fairly accurate reflection of the relative recruiting strength of the various centres. It should be noted that Johannesburg serves as a registration centre for the whole of the Witwatersrand.

From the value of building plans passed annually in each of the chief centres of the Republic, as reported in the monthly Bulletin of the Bureau of Census and Statistics, a gross total for the period 1951 - 1960 was obtained and a ratio of apprentices contracted to building plan value was calculated for each of the centres. The gross plan value for a centre is a rough but valuable indication of building manpower needs for that centre in relation to other centres. Comparing the respective apprentices/plan value ratios, enables one to determine where apprentice recruitment is lowest and where it is highest in relation to building needs. Table 15 shows these ratios.

TABLE 15

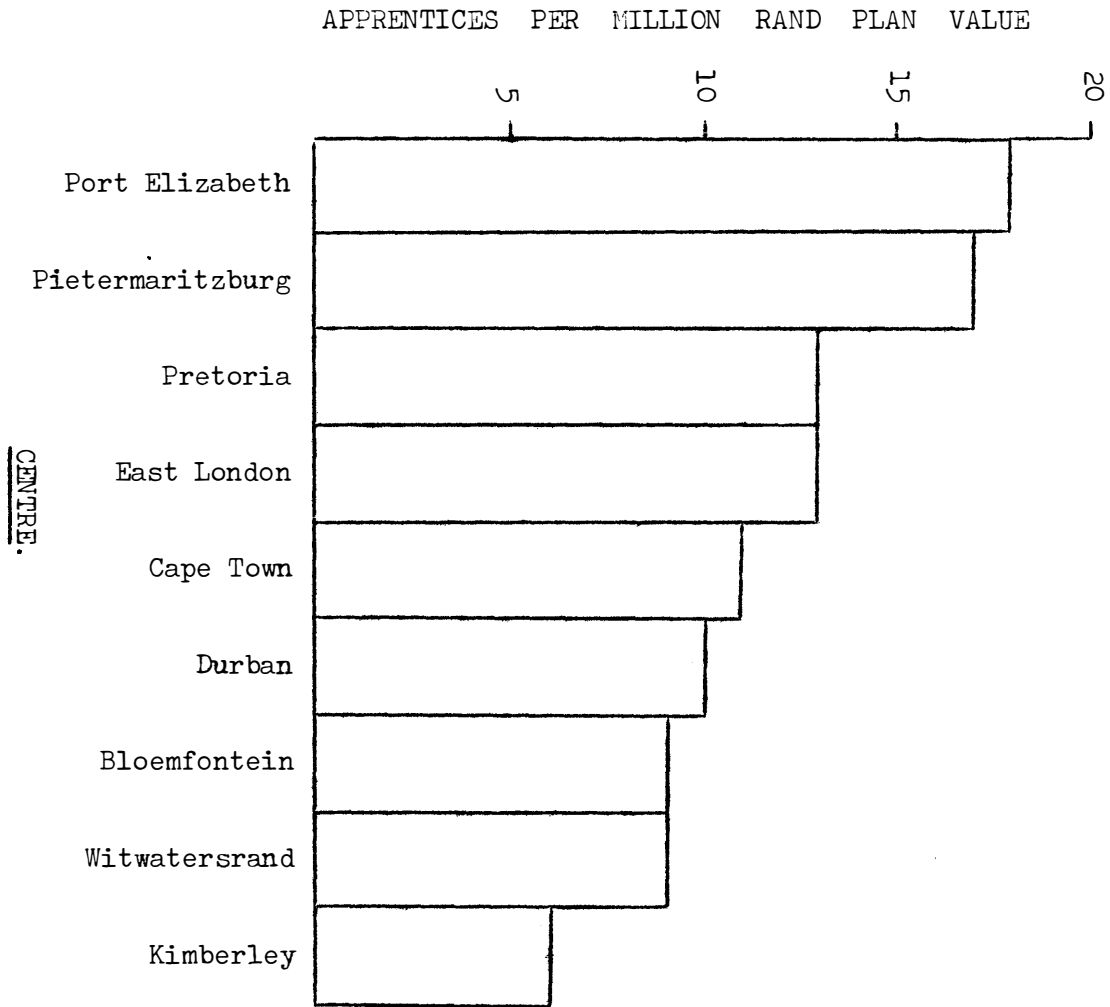
Centre Ratios of Apprentices to Building Plan Value, 1951 - 1960.

( See Graph VI )

Centre.	Apprentices per Million Rand Plan Value.
Port Elizabeth	18
Pietermaritzburg	17
Pretoria	13
East London	13
Cape Town	11
Durban	10
Bloemfontein	8
Witwatersrand	8
Kimberley	6

GRAPH VI

Centre Ratios of Apprentices to Building Plan Value, 1951 - 1960



Races.

Since race was not recorded for apprentices before 1956 and the complete figures for 1961 were not obtained by race, the period used for calculating the sample percentages of the various racial groups was 1956 - 1960. Only Natal and Cape Province are involved since apprentices in the Orange Free State and the Transvaal are all Whites. The numbers do not represent the full totals since there was a small number of omissions with regard to race in the records of the Department of Labour. However, the proportions may be regarded as relatively reliable. The following table summarizes the information.

TABLE 16.Apprentices in Racial Groups, 1956 - 1960.

( See Graph VII ).

Races.	Cape Province		Natal		Cape & Natal		Republic.	
	No.	%	No	%	No	%	No	%
Whites	738	45	499	62	1237	49	3219	73
Non-Whites	885	55	303	38	1188	51	1188	27
Coloureds	800	49.2	237	29.6	1037	42.6	1037	23.3
Malays	75	4.6	6	0.8	81	3.4	81	1.8
Asiatics	10	0.6	60	7.5	70	2.9	70	1.6

Thus, the majority of apprentices contracting in the Cape Province over the period 1956 - 1960 were Non-Whites: 55%, of which 49% were Coloureds. In Natal Non-Whites were a minority - 38% as against 62% who were Whites. When the two provinces where apprenticeship contracts are not restricted to Whites are combined, the proportions are almost equal: 49% Whites and 51% Non-Whites. On combining all provinces, to give figures for the Republic as a whole, the proportions are 73% Whites and 27% Non-Whites.

Education.

The following table shows the overall distribution of the apprentices studied according to educational standard attained at time of contracting.

GRAPH VII

Apprentices in Racial Groups.

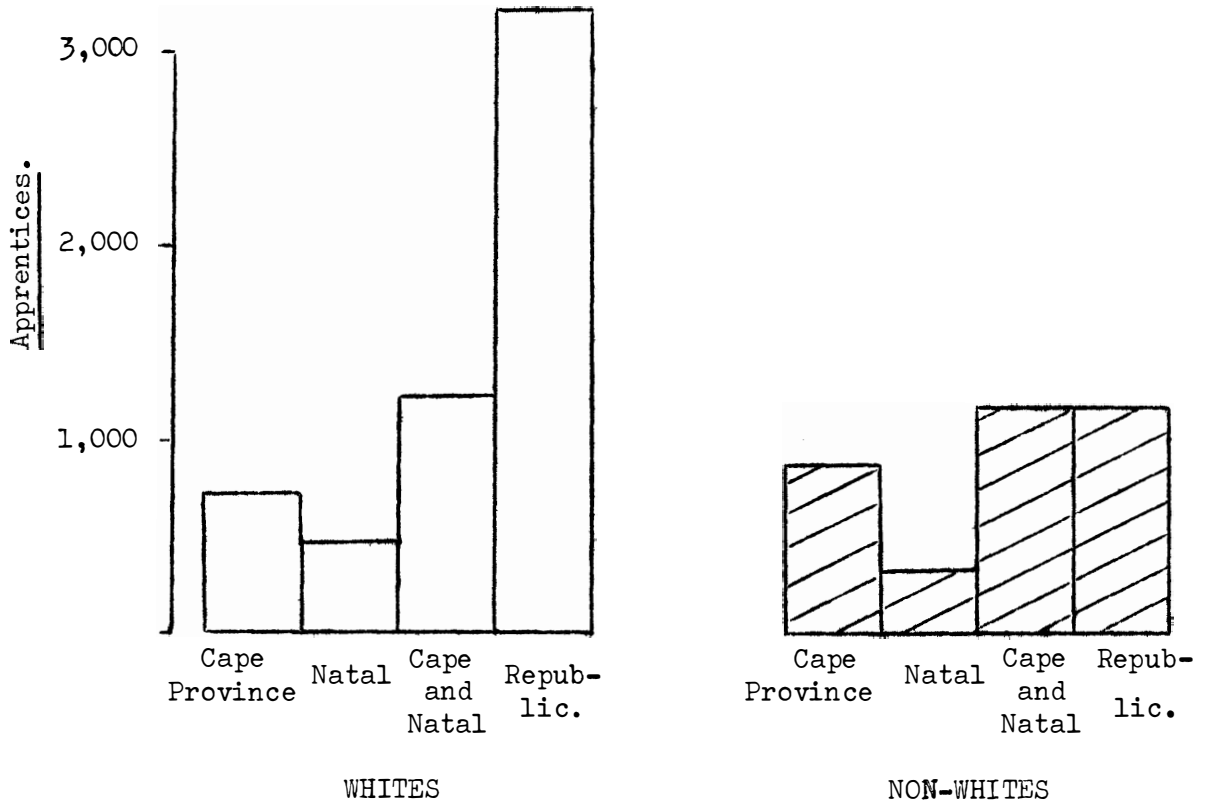


TABLE 17

Apprentices : Educational Standard. All Races.

( See Graph VIII )

Std.	NTC.I	NTC.II	NTC.III	STD.4	STD.5	STD.6	STD.7	STD.8	STD.9	MATRIC.
No.	97	35	13	33	252	5541	4022	2129	155	143
%	0.8	0.3	0.1	0.3	2.0	44.6	32.4	17.1	1.2	1.2

Thus 94% of the group fall between the educational range, stds. 6 to 8 and the largest single proportion is that of the std. 6 group: approximately 46%. Only about 2½% of these building apprentices go beyond standard 8, and just over 1% have technical qualifications (N.T.C. I - III). These proportions are virtually the same for both Whites and Non-Whites except that 1½% of the Whites obtained technical certificates (N.T.C.I - III), whereas only ½% of the Non-Whites did.

(Note: Those who obtained the National Junior Certificate are included in the standard 8 group).

The distribution of education among apprentices in the Building Industry may be compared with that of the South African male public high school population as calculated for the year 1958 by the Bureau of Census and Statistics<sup>1</sup>, (see Graph VIII). Amongst the male high school population 22% proceeded beyond standard 8, whereas less than 4% of building apprentices did. This means that only a very small number of men with managerial ability is likely to be obtainable from the artisan population. This is undesirable since the artisan's intimate knowledge of the conditions in the Industry is an important factor in potential managerial leadership.

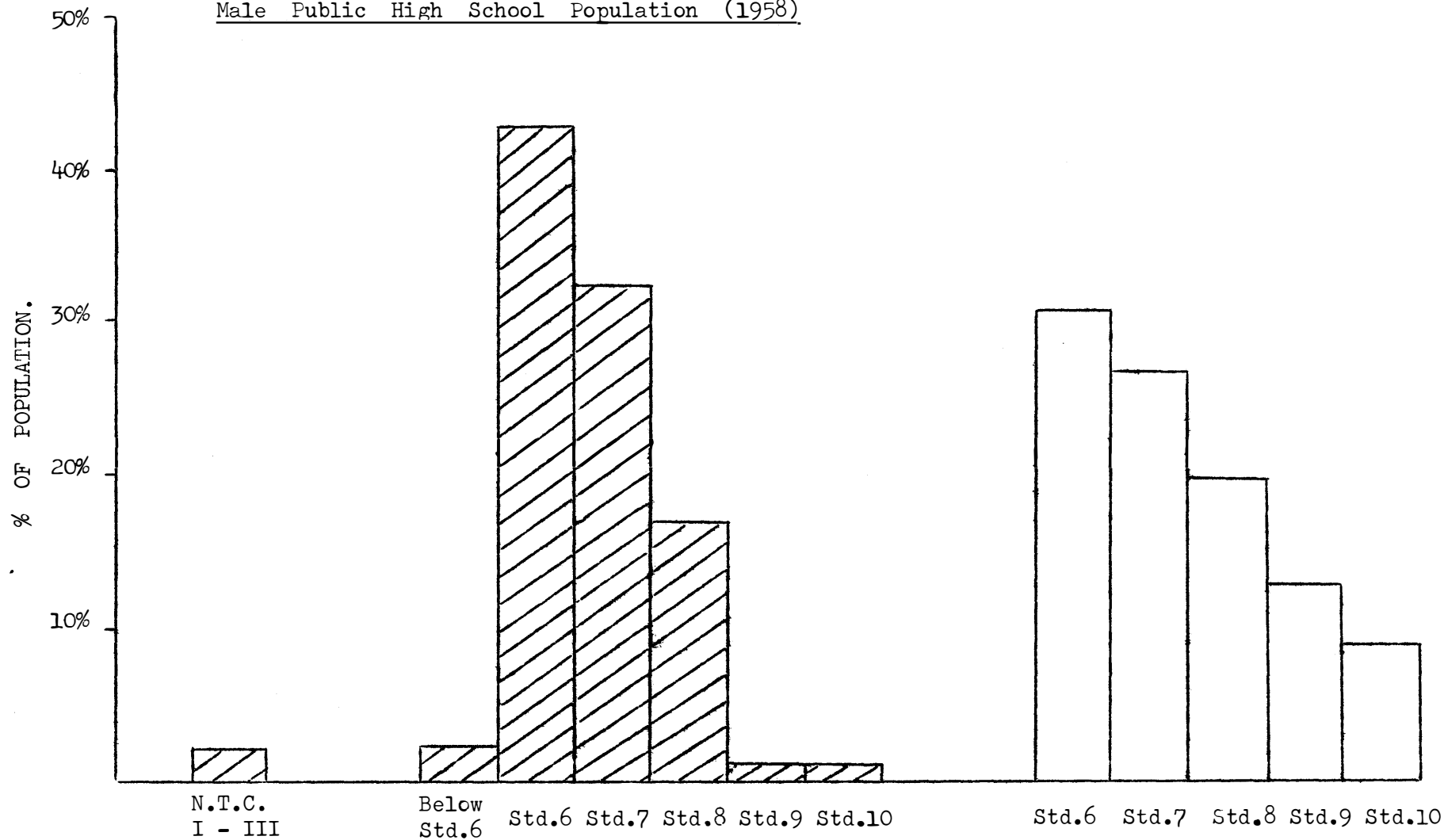
#### Age

The distribution of age at time of contract registration is shown in the following table.

TABLE 18 / ....

1. Bureau of Census and Statistics. Union Statistics for Fifty Years. Pretoria, 1960.

Male Public High School Population (1958)



BUILDING APPRENTICES

S.A. PUBLIC HIGH SCHOOL POPULATION.



TABLE 18

Apprentices Age At Time of Registration. All Races.

( See Graph IX )

Age	16 and under.	17	18	19	20	21	22	23	24 and over.	Total
No.	528	3,430	4,097	2,459	1,368	717	379	174	207	13,359
%	4	26	30	19	10	5	3	1	2	100

Most building trade apprentices (85%) begin their apprenticeship between the ages of 17 and 20. Only 4% begin before 17 and 11% after the age of 20, i.e. this has been the pattern over roughly the last 10 years.

When comparing the races a slight difference is found with regard to age at registration: only 8% of the Whites began their apprenticeship after the age of 20, whereas 23% of the Coloureds did. The other Non-White groups are too small to afford a valid comparison.

Trades.

Table 19 shows the designated trades and the number of apprentices in each. The proportions of the trades are also shown and these may be taken as representative of the trade contracts over roughly the last 10 years.

TABLE 19.

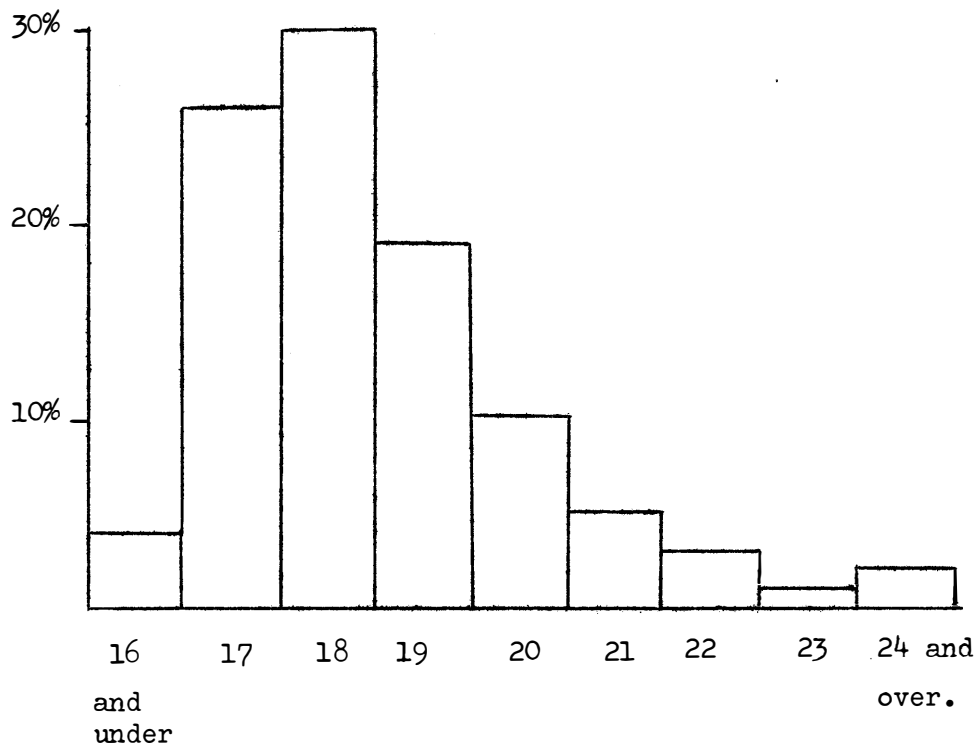
Building Apprentices : Trades. All Races.

( See Graph X )

Trade.	No	%
Carpenter & Joiner	2283	17.0
Bricklayer	1723	12.9
Electrical Wireman	1672	12.5
Plumber	1564	11.7
Carpenter	1462	10.9
Painter & Decorator	1050	7.8
Joiner	674	5.0
Bricklayer & Plasterer	526	3.9
Plasterer	443	3.3
Woodmachinist	417	3.1
Stonemason	374	2.8
Shopfitter - Wood	321	2.4
Sheetmetalworker	148	1.1

GRAPH IX

Apprentices ; Age at Time of Registration  
All Races.



AGE

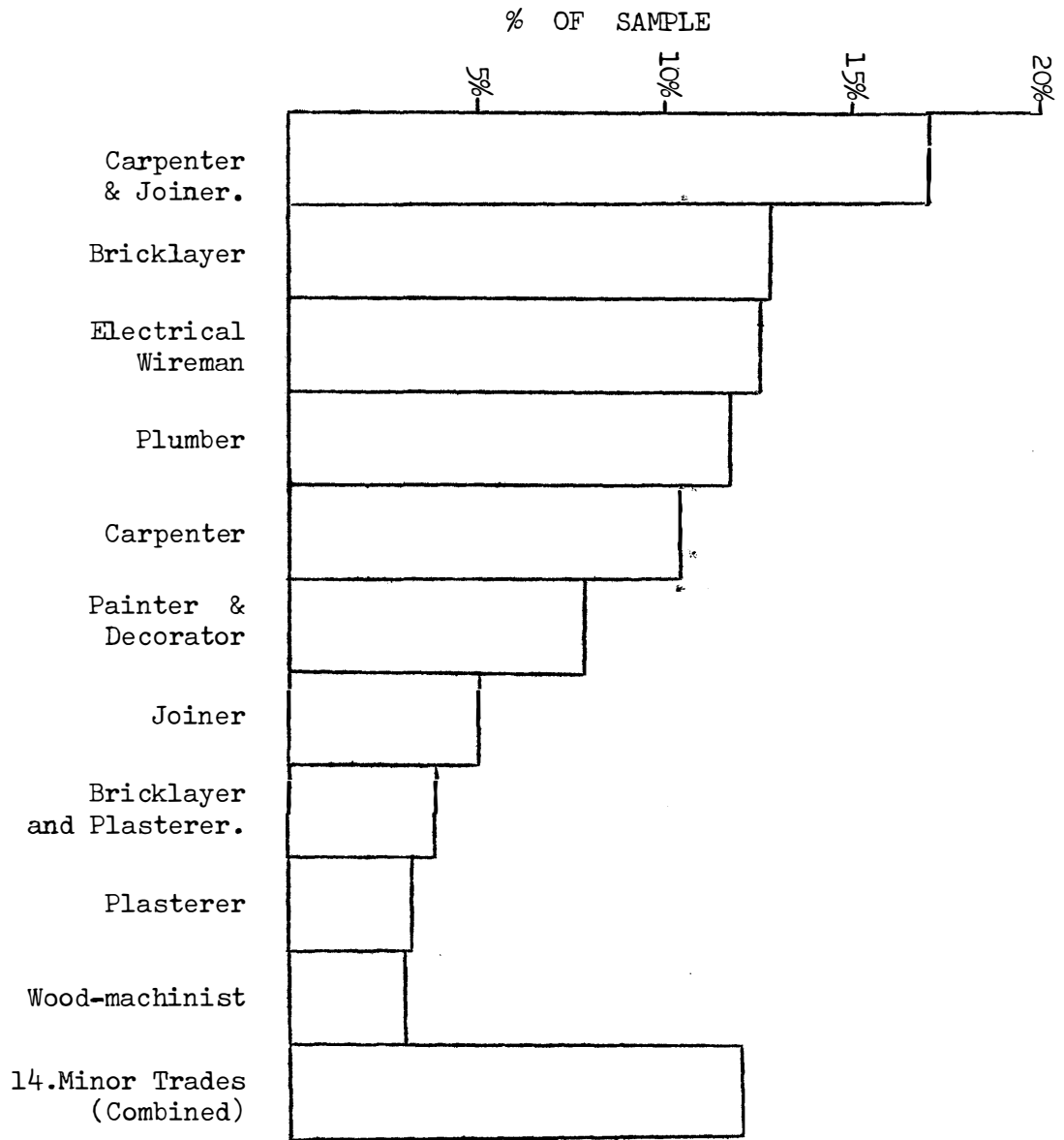
GRAPH XBuilding Apprentices : Trades, All Races.

Table 19 Cont'd.

Trade.	No.	%
Leadlight Maker & Glazier	117	0.9
Signwriter	96	0.7
Wall Tiler & Marble Fixer	87	0.6
Wall and Floor Tiler	71	0.5
Polisher	62	0.5
Shopfitter Arch. Metal	50	0.4
Reconstructed Stone and Terazzo Worker	39	0.3
Sawdoctor	35	0.3
Letter Cutter and Decorator	34	0.3
Marble Mason	13	0.1
TOTAL	13,424	100.0

The main features of this distribution are as follows. The woodworking trades comprise 38% and the "wet" trades (Bricklaying and Plastering) 20% of the sample. The other chief trades are: Electrical Wireman, (12½%); Plumber (12%); and Painter (8%). The rest of the trades 13 in all, comprise only 12% of the group.

The above proportions may be compared with those obtaining amongst the artisan population as calculated from the tables issued by the Department of Labour following their manpower survey carried out in 1959. This rough comparison gives some idea of likely trade shortages of apprentices, if it is assumed that the artisan trade proportions are functional for the Building Industry at present. Only the main trades are shown:

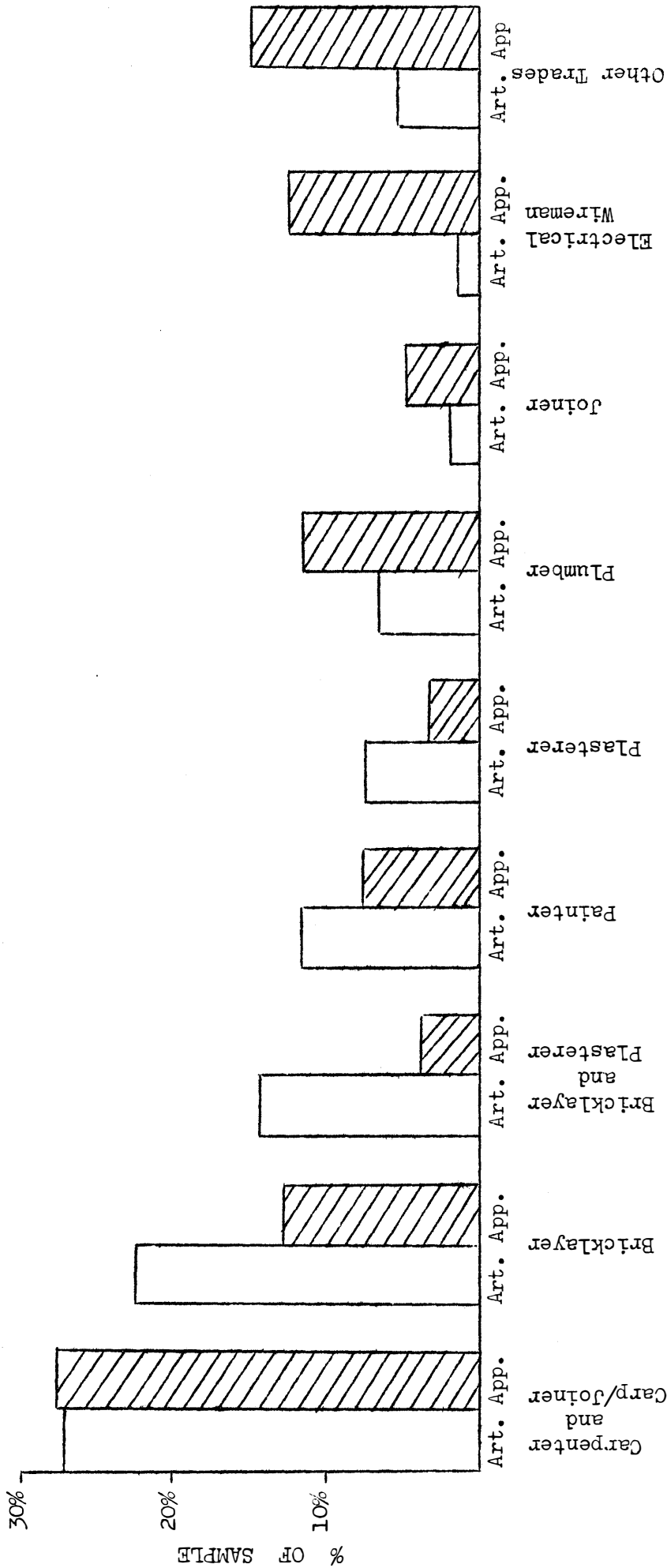
TABLE 20

Artisans (1959) and Apprentices  
Proportions, - All Races

(See Graph XI )

Trade.	% Artisans	% Apprentices
Carpenter & Carpenter Joiner	27.2	27.9
Bricklayer	22.5	12.9
Bricklayer & Plasterer	14.5	3.9
Painter	11.7	7.8
Plasterer	7.8	3.3
Plumber	6.6	11.7
Joiner	1.9	5.0
Electrical Wireman	1.5	12.5
Other trades	5.3	15.0

Artisans (1959) and Apprentices : Proportions, All Areas



It must be stressed that this comparison is only rough but it reflects that the trades Bricklaying and Plastering appear to be unpopular and in need of more apprentices, that the Woodworking trades are adequately served in relation to existing artisan numbers, while the more technical trades, Plumbing and Electrical Wiring, are popular, and the proportion of apprentices they are receiving is considerably in excess of the existing artisan proportion for these trades. This does not imply that any trade is getting sufficient numbers of apprentices.

There are negligible differences between the trades with respect to standard of education and age at time of contracting, apart from the tendency of apprentices taking Electrical Wiring to have a slightly higher standard of education than those in other trades. Put simply, there will be a greater proportion of Electrical apprentices with a standard 7 than in other trades.

#### Wastage.

Of the 13,424 apprentices included in the sample, 2,575 cancelled their contracts before term, over the period studied. This is a wastage rate of 19% or 1 in 5, but it is slightly underestimated since a number of those who registered over the period 1958 - 1961 are likely to cancel their contracts after 1961. Taking the period 1949 - 1958, which would reflect a more accurate wastage figure, the number of cancelled contracts is 22% of the total i.e. between 1 in 5 and 1 in 4 contracts were cancelled.

The wastage rate of each trade (all races) over the period 1949 - 1958 is shown in the following table.

TABLE 21

Trades : Apprentice Wastage

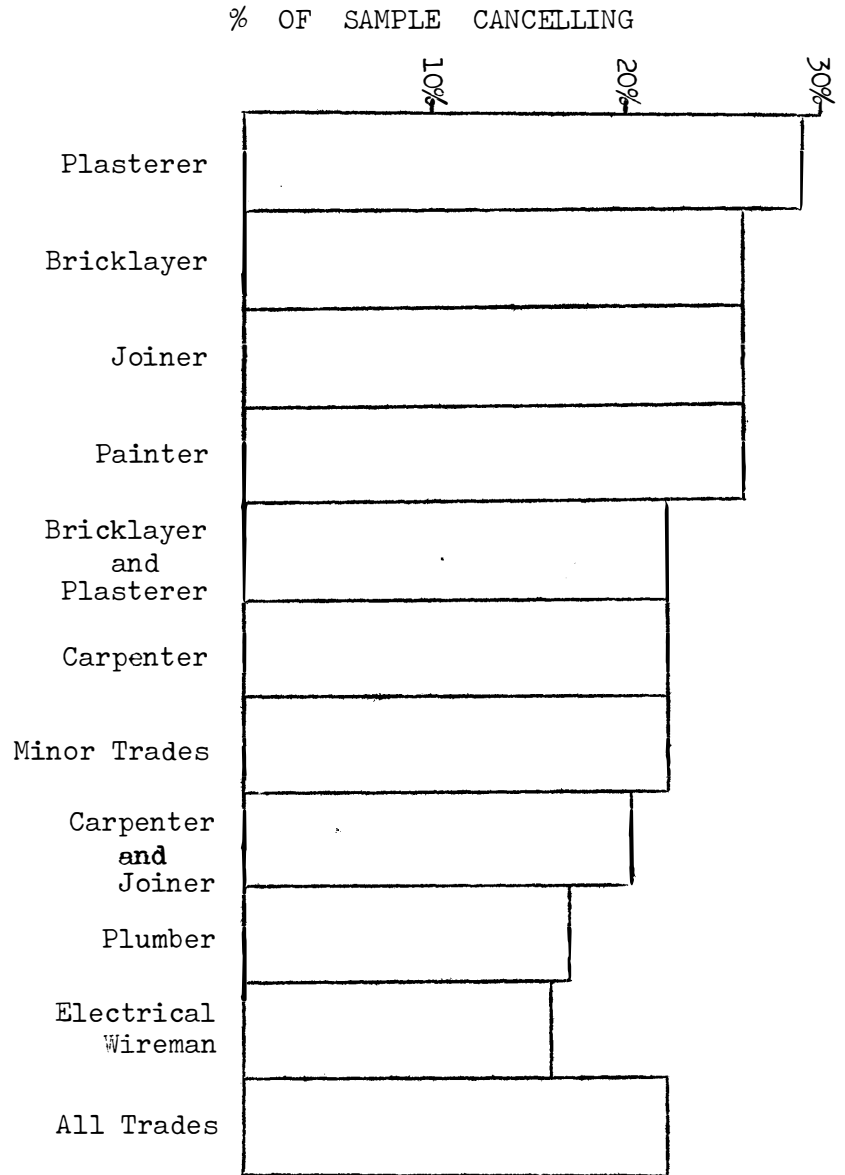
All Races 1949 - 1958

( See Graph XII )

Trade	Wastage %
Plasterer	29
Bricklayer	26
Joiner	26
Painter	26
Bricklayer and Plasterer	22
Carpenter	22
Minor trades	22
Carpenter and Joiner	20
Plumber	17

GRAPH XII

Trades : Apprentice Wastage All Races 1949 - 1958



TRADES

These wastage rates are instructive when compared to the artisan/apprentice proportions as shown in Table 20, since the "wet" trades, Plastering and Bricklaying, show proportionally low recruitment and high wastage rates while the technical trades, Plumbing and Electrical wiring show the reverse: proportionally high recruitment and low wastage.

The races also show differential wastage rates:

TABLE 22.

Races : Apprentice Wastage, 1955 - 1958.

( See Graph XIII )

Race.	Wastage %
Asiatics	31
Whites	24
Coloureds	14
Malays	7

A feature of this table is the marked difference between the Coloured and Asiatic groups (14% and 31% respectively). It is noteworthy that the wastage rate for Coloureds is considerably lower than that for Whites (14% and 24% respectively), and this is true for every trade, as the following table shows.

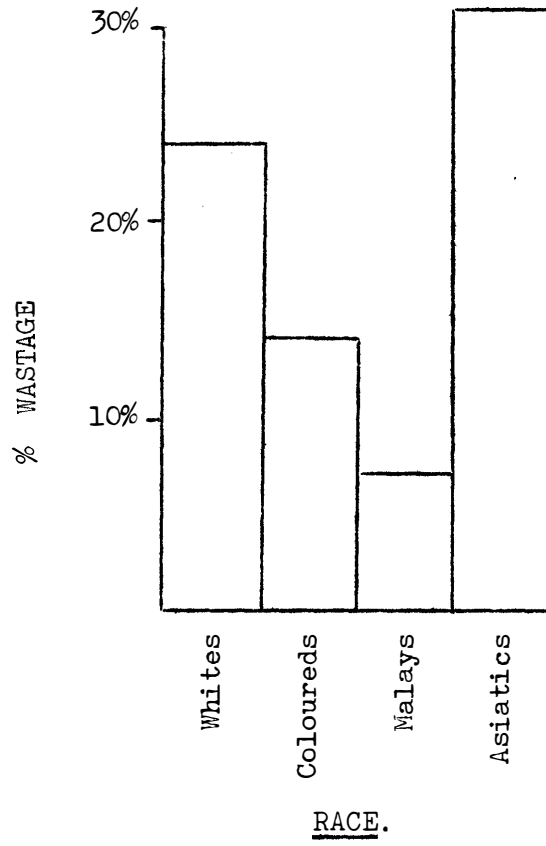
TABLE 23

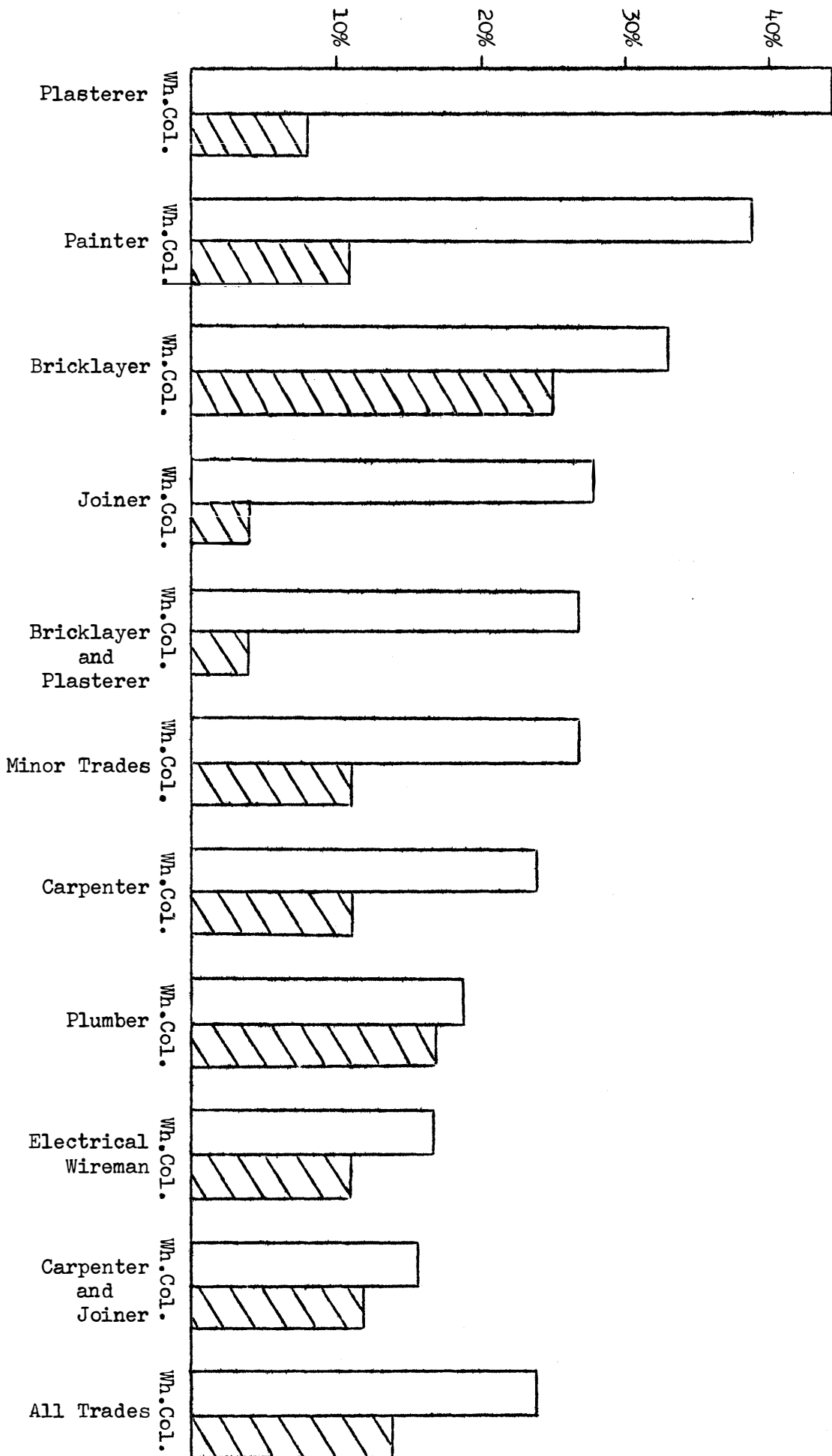
Apprentice Wastage : Races and Trades, 1955 - 1958.

( See Graph XIV )

Trade	Whites : Wastage %	Coloureds Wastage %
Plasterer	44	8
Painter	39	11
Bricklayer	33	25
Joiner	28	4
Bricklayer & Plasterer	27	4
Minor trades	27	11
Carpenter	24	11
Plumber	19	17
Electrical Wireman	17	11
Carpenter & Joiner	16	12
All trades	24	14



GRAPH XIIIRaces : Apprentice Wastage, 1955 - 1958



There has not been much variation in the wastage rates over the period 1949 - 1958. The annual rates are set out in Table 24.

TABLE 24

Apprentices : Annual Wastage  
All Races : 1949 - 1958.

Year	1949	50	51	52	53	54	55	56	57	58
% Wastage	20	21	21	21	22	27	26	22	20	19

With regard to geographical area, the lowest wastage rate is found in the Western Cape Province (12%) and the highest in the Transvaal (26%); the other provinces have similar wastage figures:- (Eastern Cape: 20%; O.F.S.: 22% and Natal: 21%. These percentages have been calculated on the figures for the whole period studied and so underestimate the wastage but afford a valid comparison between the areas. The low wastage figure of the Western Cape is clearly due to the predominance of Coloured apprentices there, since this racial group shows comparatively little wastage.

Trade Test Pass Rates.

The tables in this section are based on figures supplied by the Central Organization for Trade Testing. Pass rates for the various trades in the Building Industry over the period 1954 - 1961 are shown in Table 25.

TABLE 25

Trade Test Pass Rates : Building Apprentices  
All Centres : 1954 - 61

Trade.	No Tested	No Passed	% Pass
Masonry	39	25	64
Painting	416	163	39
Bricklaying	1269	334	26
Carpentry	2729	715	26
Plumbing	819	178	22

GRAPH XV

Trade Test Pass Rates : Centres, 1954 - 1961

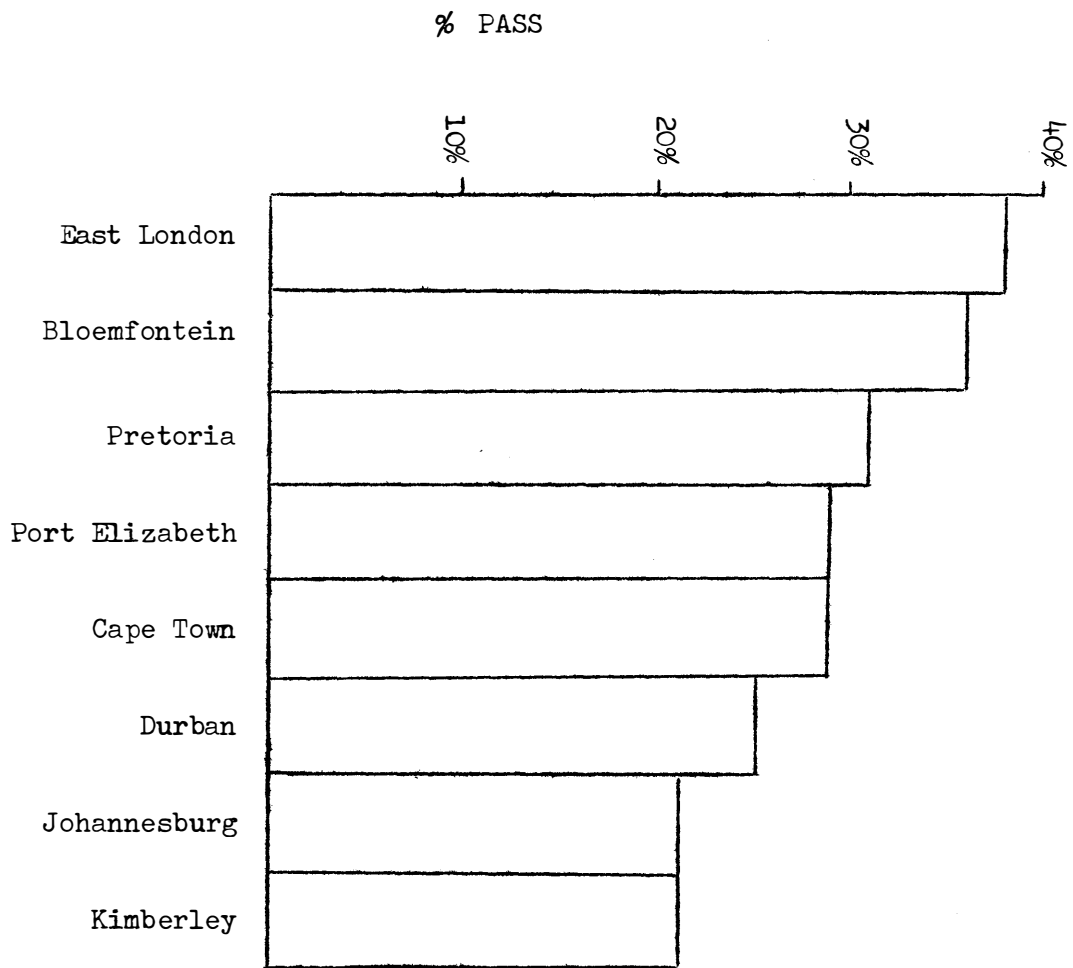


TABLE 27

Trade Test Pass Rates : Other Industries  
And Government

Industry	No Tested	No passed	% Pass	Period.
Explosives	21	7	33	1956-61
S.A. Railways	780	250	32	1956-61
Government	122	29	24	1955-61
Metal	68	17	25	1956-61
Mining	259	12	5	1957-61

Annual Recruitment.

The recruitment patterns are best illustrated graphically and the following graphs show these patterns by trade, race and area for the relevant periods. The exact span of the periods has been determined by the adequacy of the data for the variables considered.

TABLE 28Annual Recruitment : Bricklayers. 1951 - 1960

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No of Recruits	237	174	139	169	165	130	103	101	77	115	1410

GRAPH XVI

Apprentices



TABLE 29Annual Recruitment : Bricklayers and Plasterers. 1951 - 1960

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	54	46	52	54	71	39	37	36	45	40	474

GRAPH XVII a

Apprentices

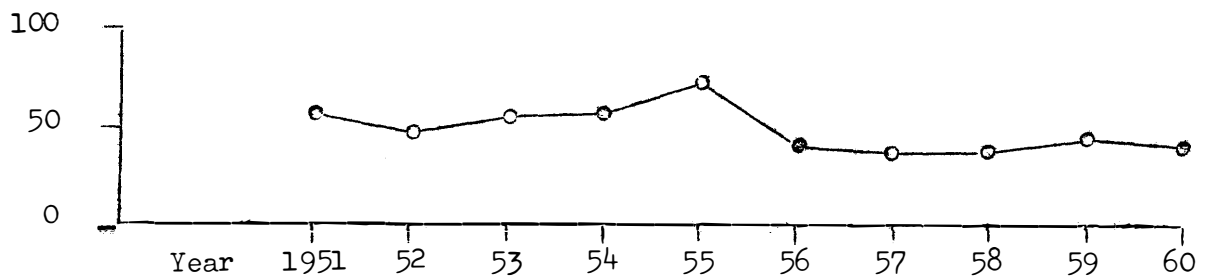


TABLE 30Annual Recruitment : Plasterers. 1951 - 1960

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	51	61	44	43	47	47	24	13	22	28	380

GRAPH XVII b

Apprentices

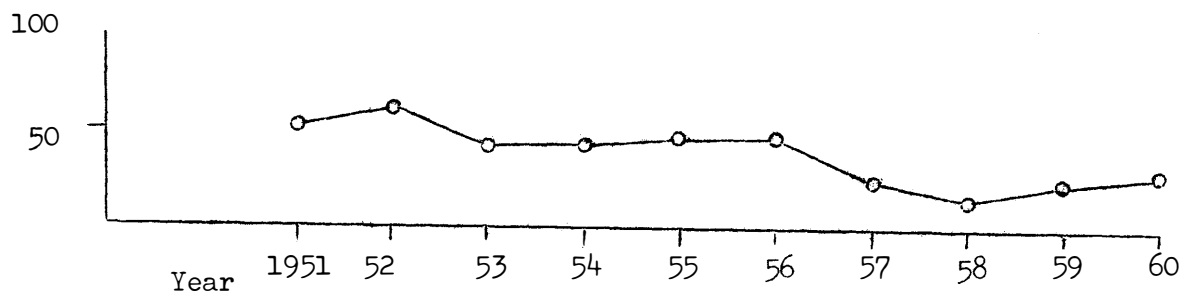




TABLE 31

Annual Recruitment : Carpenters. 1951 - 1960

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No of Recruits	13	89	149	194	175	110	149	126	152	198	1355

GRAPH XVIII

Apprentices

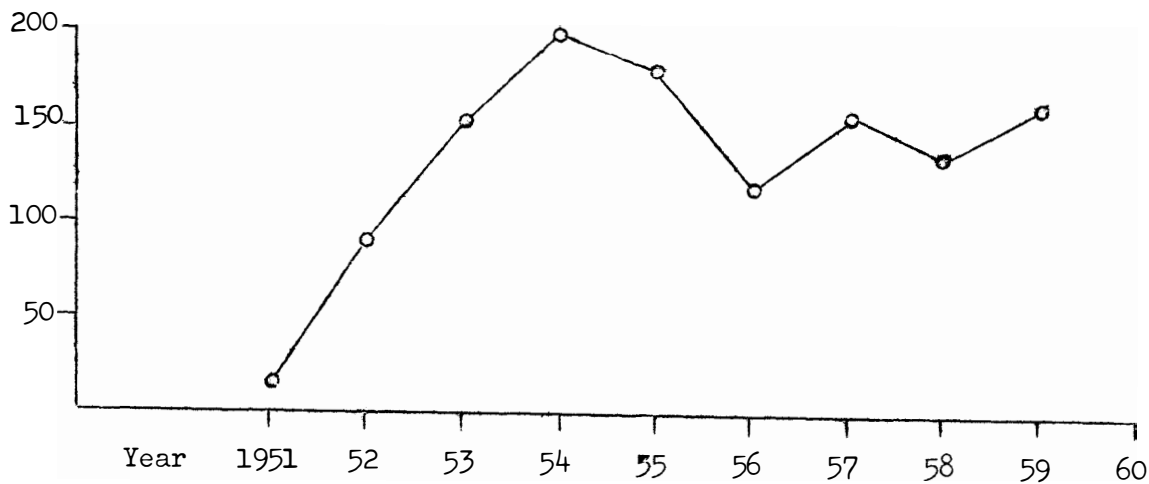


TABLE 32

Annual Recruitment Joiners, 1952 - 1960

Year	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	38	67	105	99	43	66	69	63	76	628

GRAPH XIX



TABLE 34

Annual Recruitment : Woodworkers. 1951 - 1960.

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	653	465	476	443	393	241	255	241	249	344	3660

GRAPH XXI

Apprentices.

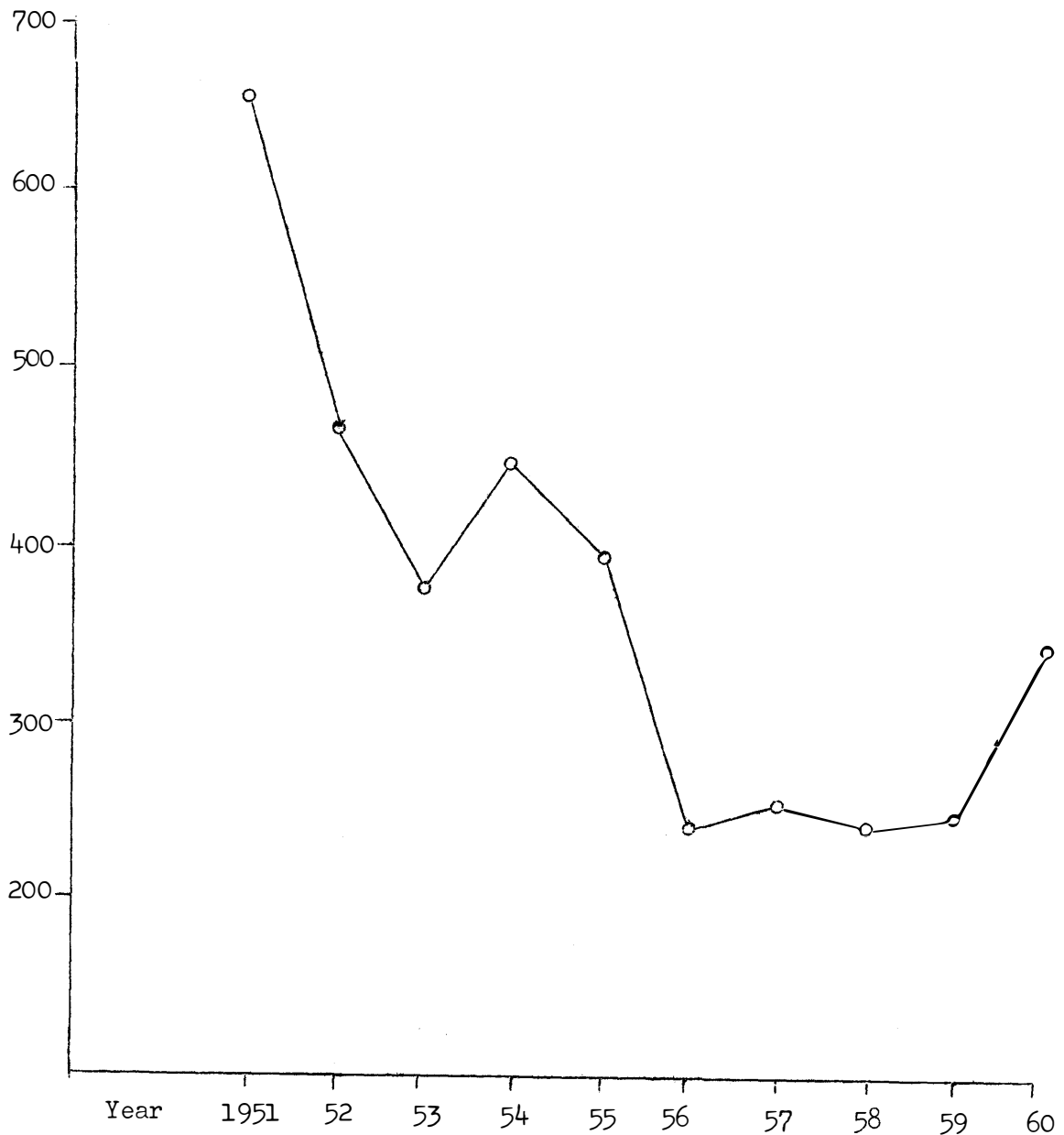


TABLE 35Annual Recruitment : Painters. 1951 - 1960.

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	67	73	109	102	101	76	92	77	81	105	883

GRAPH XXII

Apprentices.

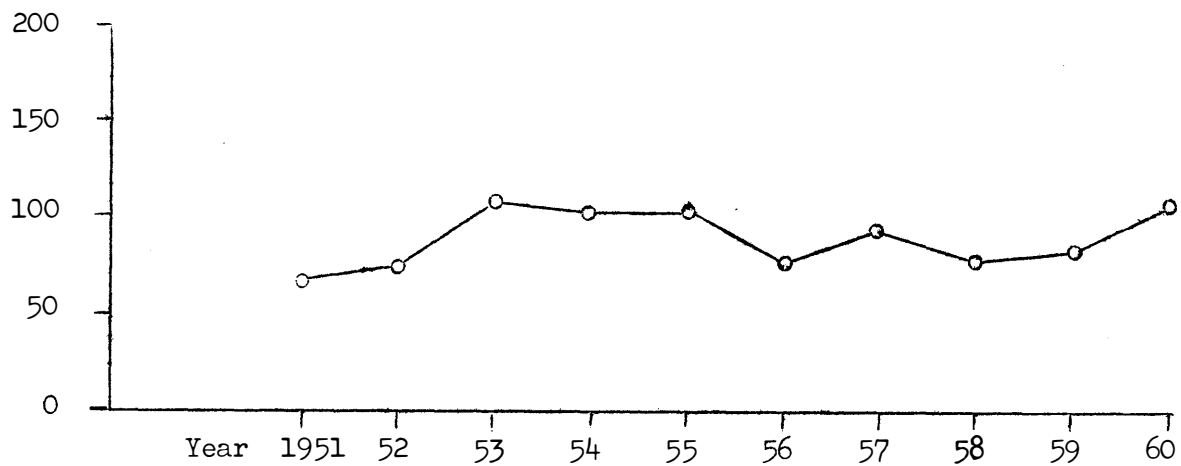


TABLE 36Annual Recruitment : Plumbers. 1951 - 1960

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	157	145	151	167	174	111	116	109	94	124	1348

GRAPH XXIII

Apprentices

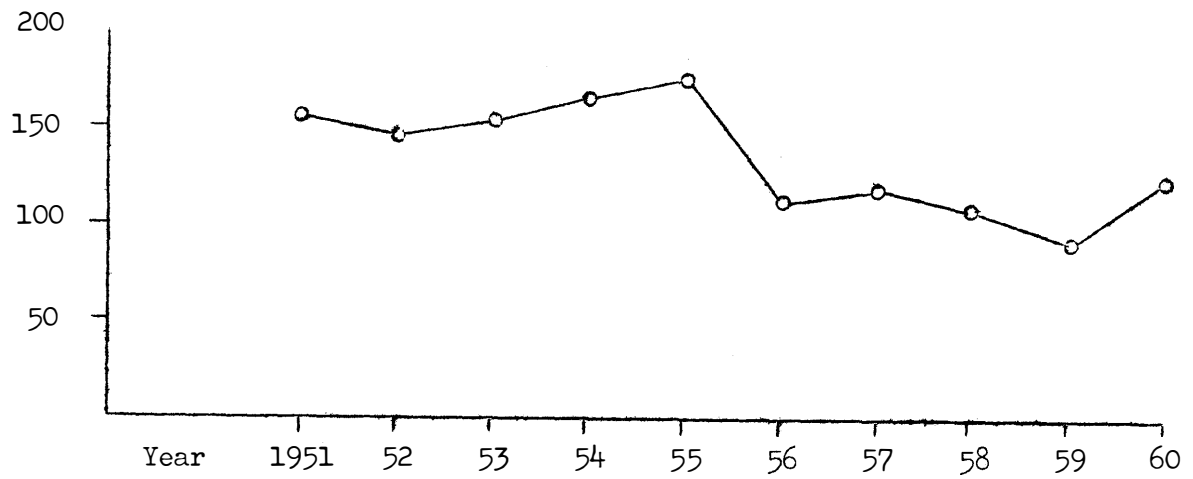


TABLE 37Annual Recruitment : Electrical Wiremen. 1951 - 1960

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	144	169	155	160	154	88	136	140	132	138	1416

GRAPH XXIV

Apprentices.

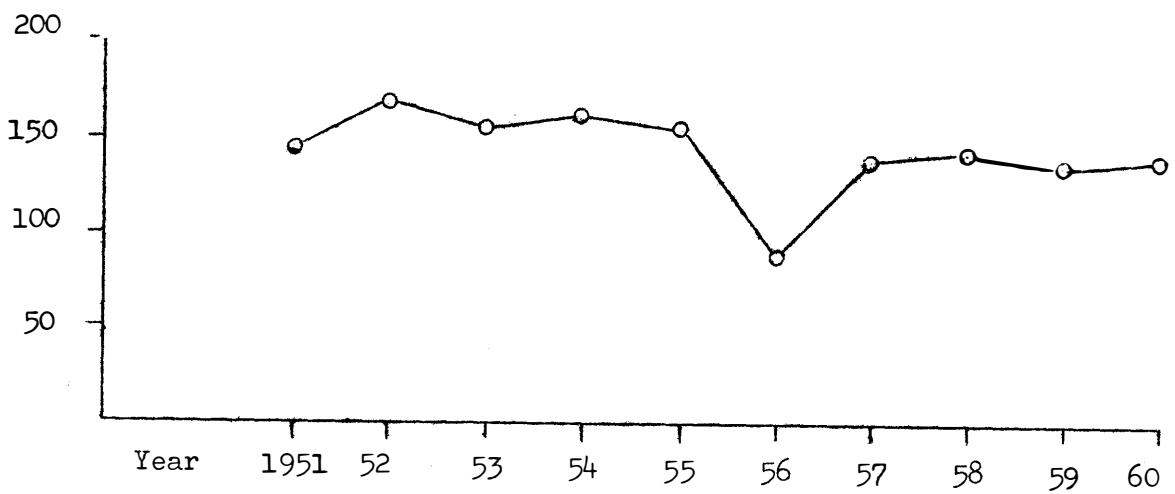


TABLE 38Annual Recruitment : 14 Minor Trades. 1951 - 1960

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	194	172	175	211	201	124	157	104	117	148	1603

GRAPH XXV

Apprentices

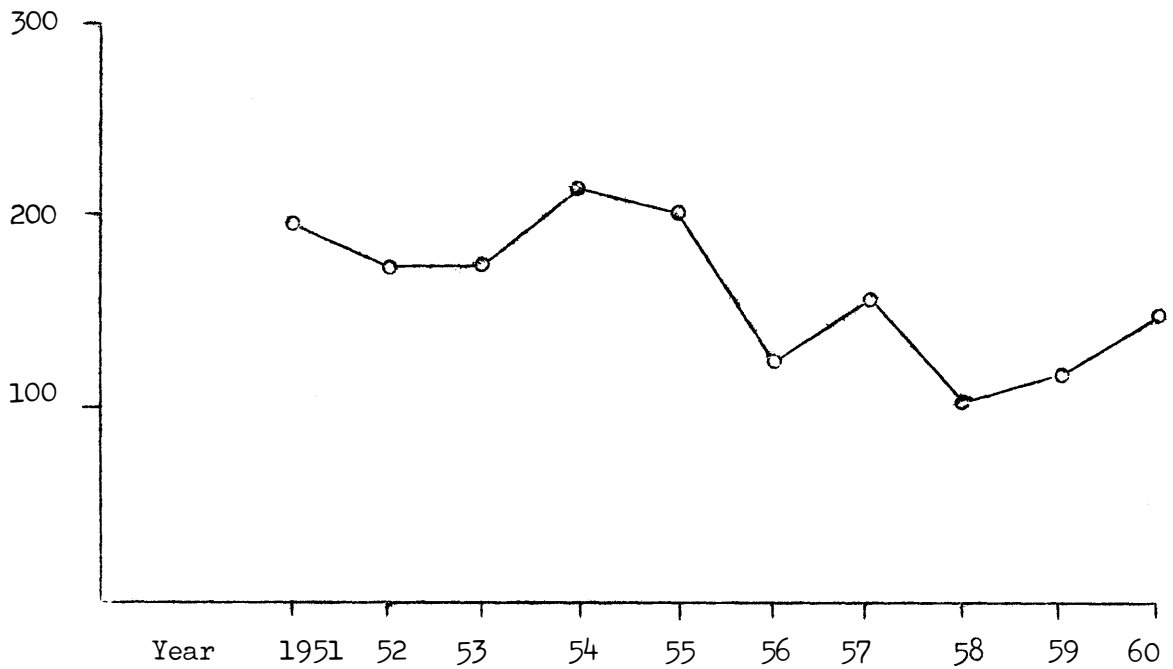


TABLE 39Annual Recruitment. All Trades. 1951 - 1960

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	Total
No. of Recruits	1557	1305	1203	1349	1306	856	921	821	817	1042	11,177

GRAPH XXVI

Apprentices.

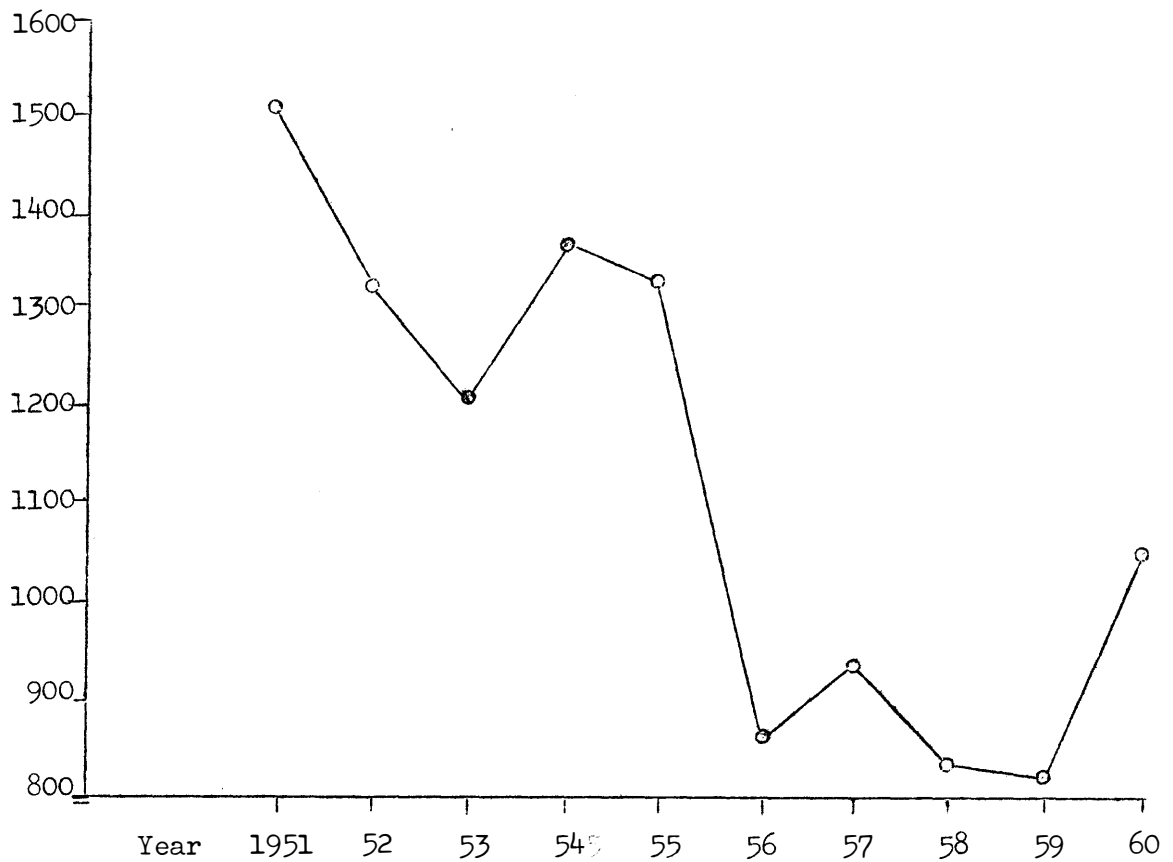




TABLE 40Annual Recruitment : Whites : Transvaal. 1951 - 1960.

<u>Year.</u>	<u>Apprentices.</u>
1951	648
1952	618
1953	570
1954	610
1955	524
1956	280
1957	413
1958	386
1959	358
1960	<u>400</u>
TOTAL	<u>4807</u> =====

GRAPH XXVII

Apprentices.

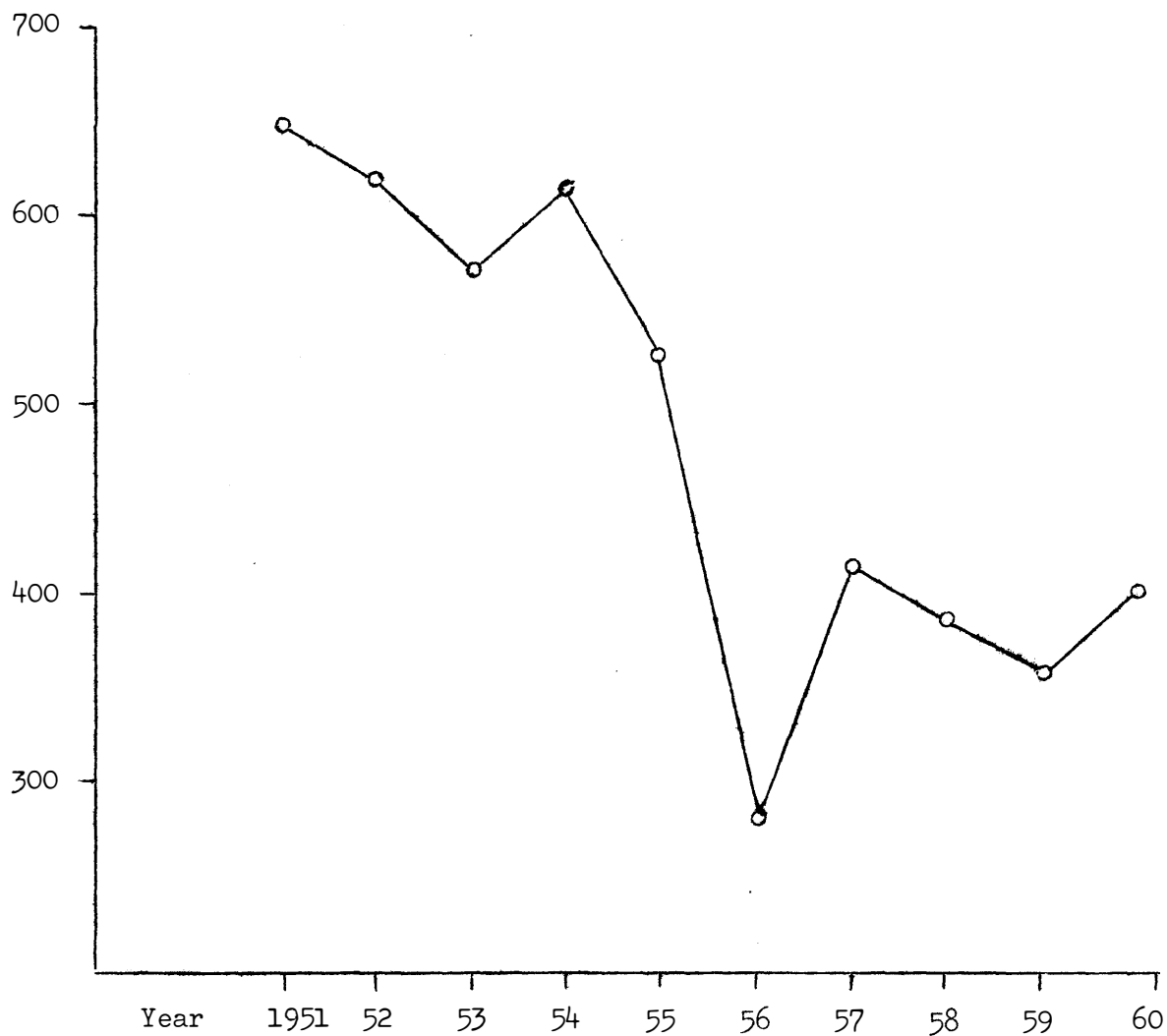


TABLE 41

Annual Recruitment : Whites : O.F.S.  
( WELKOM included ). 1951 - 1960.

<u>Year</u>	<u>Apprentices.</u>
1951	89
1952	66
1953	71
1954	56
1955	59
1956	47
1957	27
1958	35
1959	44
1960	<u>63</u>
TOTAL	557 =====

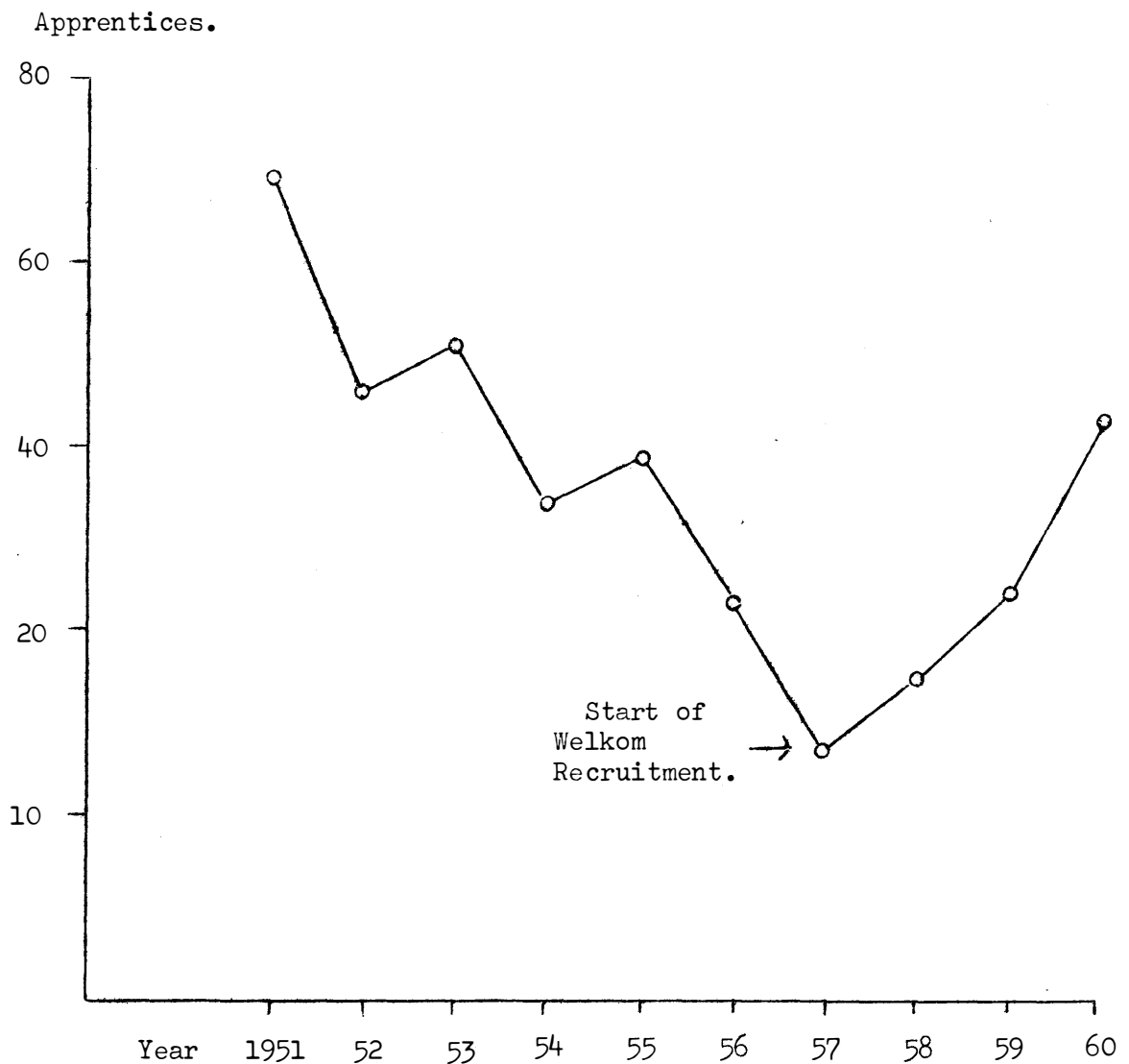
GRAPH XXVIII

TABLE 42Annual Recruitment : Races : Natal. 1956 - 1960

<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>	<u>Asiatics.</u>
1956	131	84	16
1957	89	67	12
1958	66	33	10
1959	95	26	15
1960	<u>118</u>	<u>27</u>	<u>7</u>
	499	237	60
	=====	=====	=====

(Numbers by races unknown before 1956).

GRAPH XXIX

Apprentices.

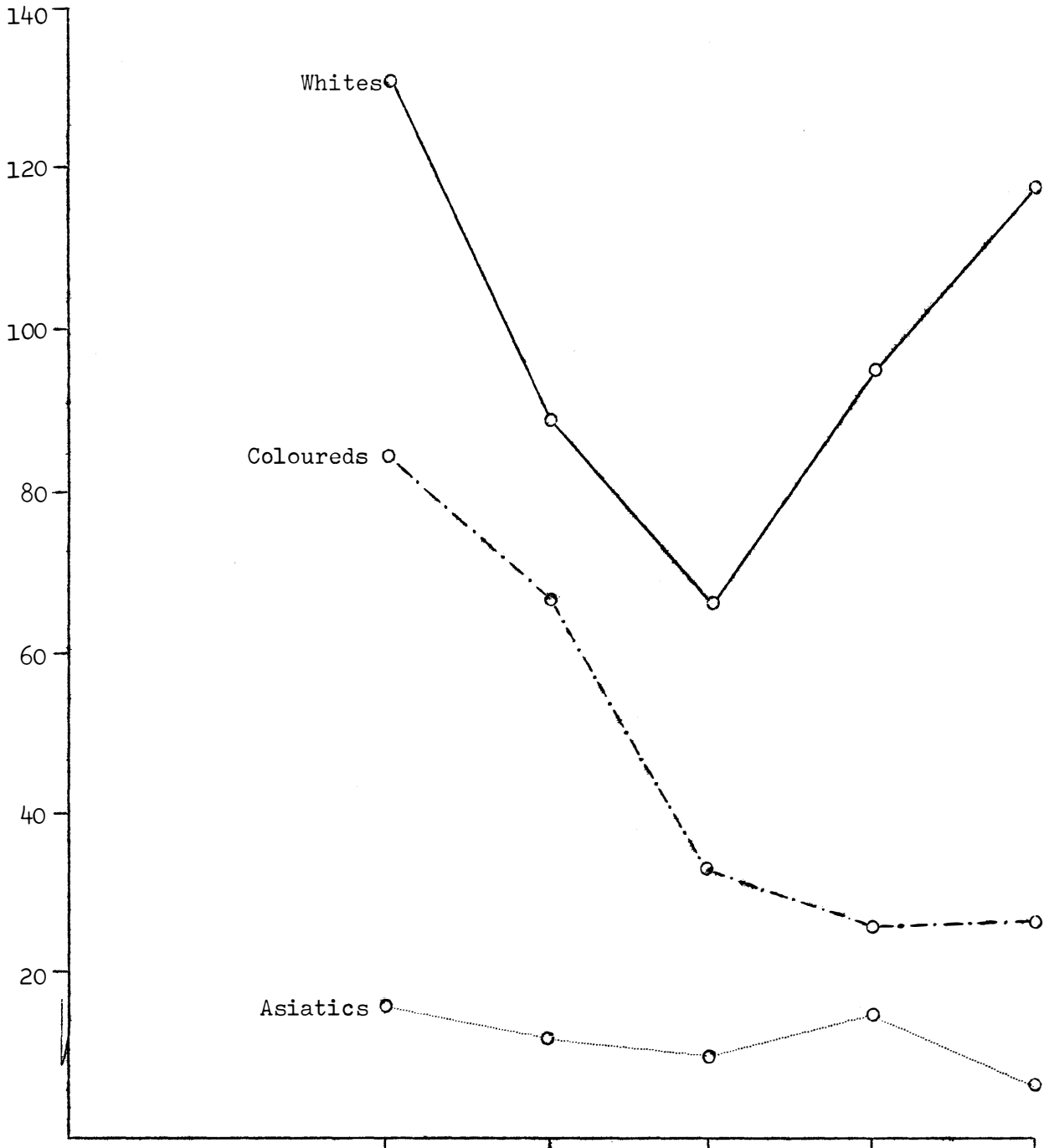


TABLE 43Annual Recruitment : Races : Cape Province. 1955 - 1960.

<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	132	166
1957	150	145
1958	109	135
1959	151	132
1960	<u>193</u>	<u>222</u>
TOTALS	735	800
	=====	=====

(Numbers by Race unknown before 1956)

GRAPH XXX

Apprentices.

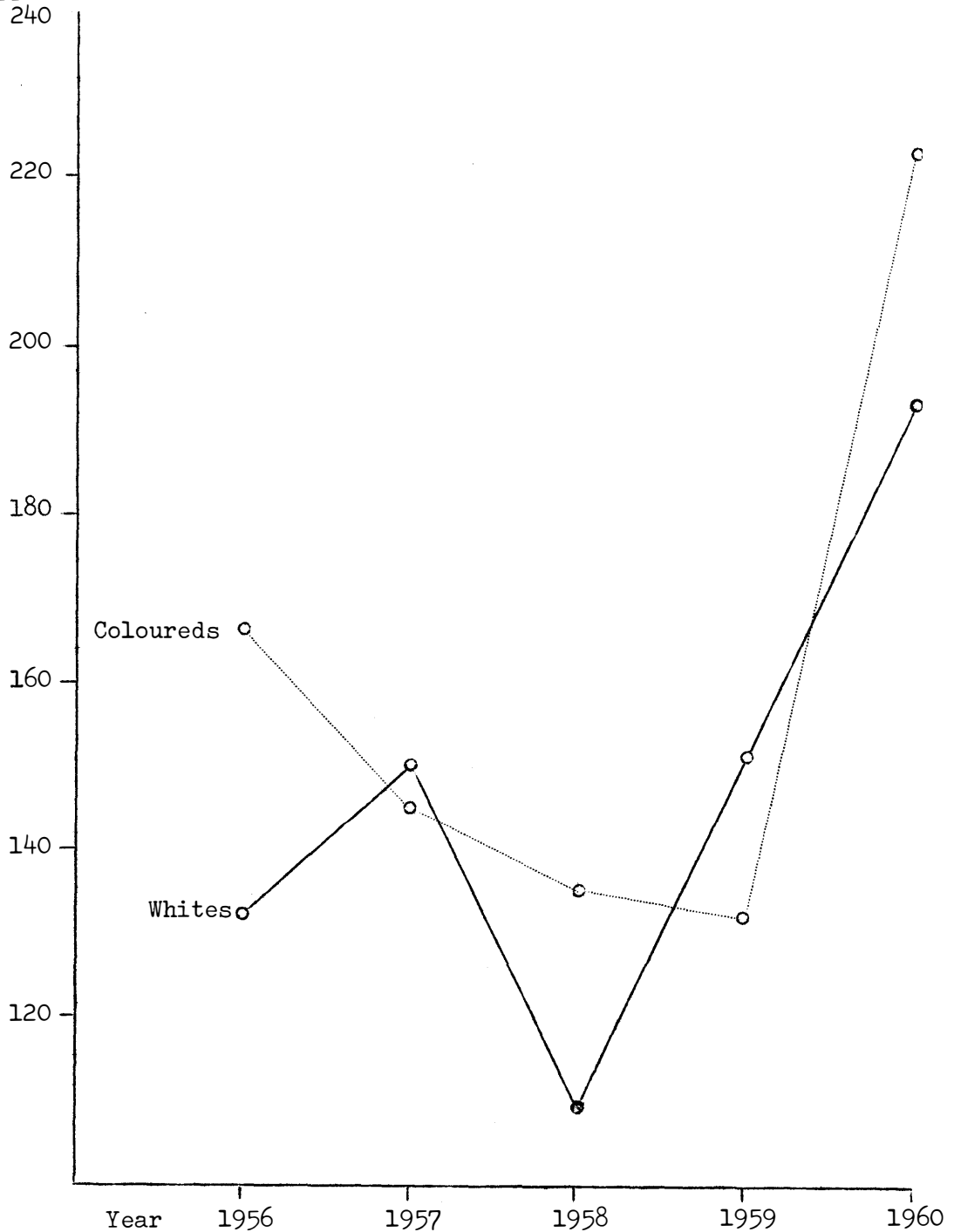


TABLE 44Annual Recruitment : Races : Bricklayers. 1956 - 1960

<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	54	72
1957	58	37
1958	46	38
1959	48	27
1960	<u>71</u>	<u>36</u>
TOTALS	<u>277</u>	<u>210</u>
	=====	=====

GRAPH XXXI

Apprentices.

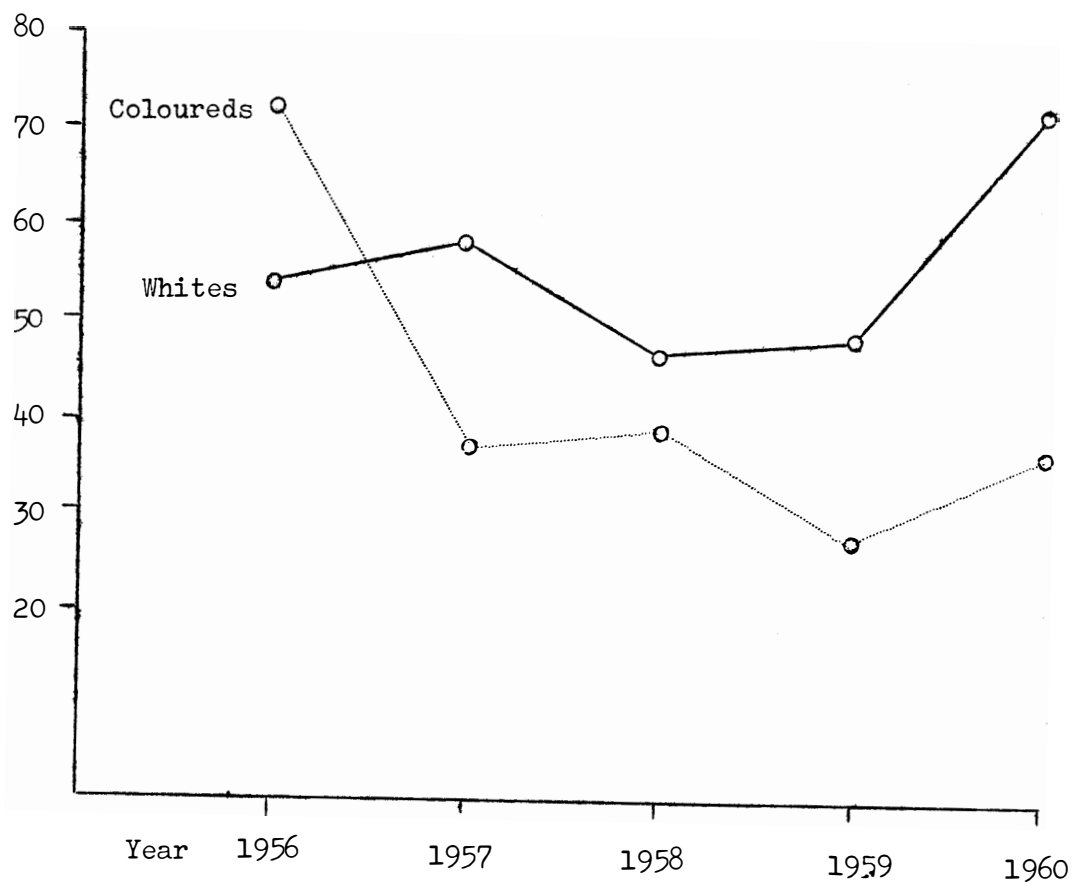


TABLE 45

Annual Recruitment : Races :  
Bricklayers and Plasterers. 1956 - 1960

<u>Year</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	19	14
1957	9	26
1958	13	18
1959	9	25
1960	<u>8</u>	<u>26</u>
TOTALS	<u>58</u> =====	<u>109</u> =====

GRAPH XXXII

Apprentices.



TABLE 46Annual Recruitment : Races : Plasterers. 1956 - 1960.

<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	19	26
1957	10	12
1958	5	6
1959	14	6
1960	<u>9</u>	<u>10</u>
TOTALS	57 =====	60 =====

GRAPH XXXIII

Apprentices.

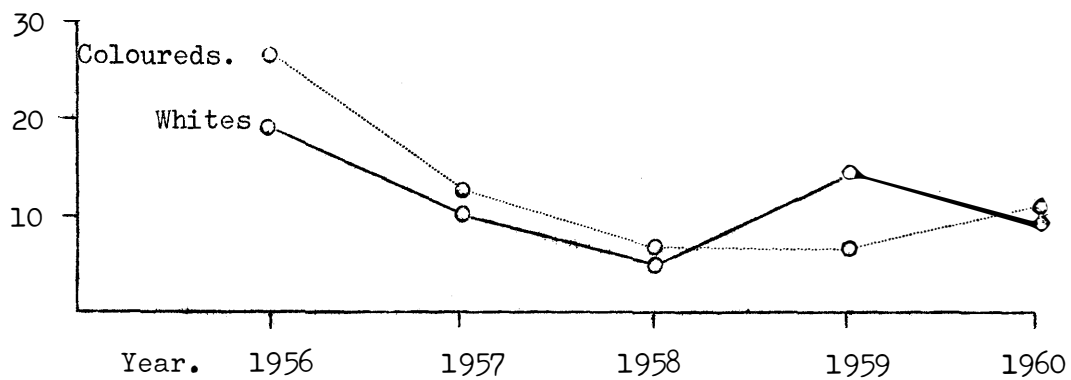


TABLE 47

Annual Recruitment : Races : Carpenters. 1956 - 1960

<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	72	35
1957	97	39
1958	73	39
1959	91	54
1960	<u>106</u>	<u>80</u>
TOTALS	439 =====	247 =====

GRAPH XXXIV

Apprentices.

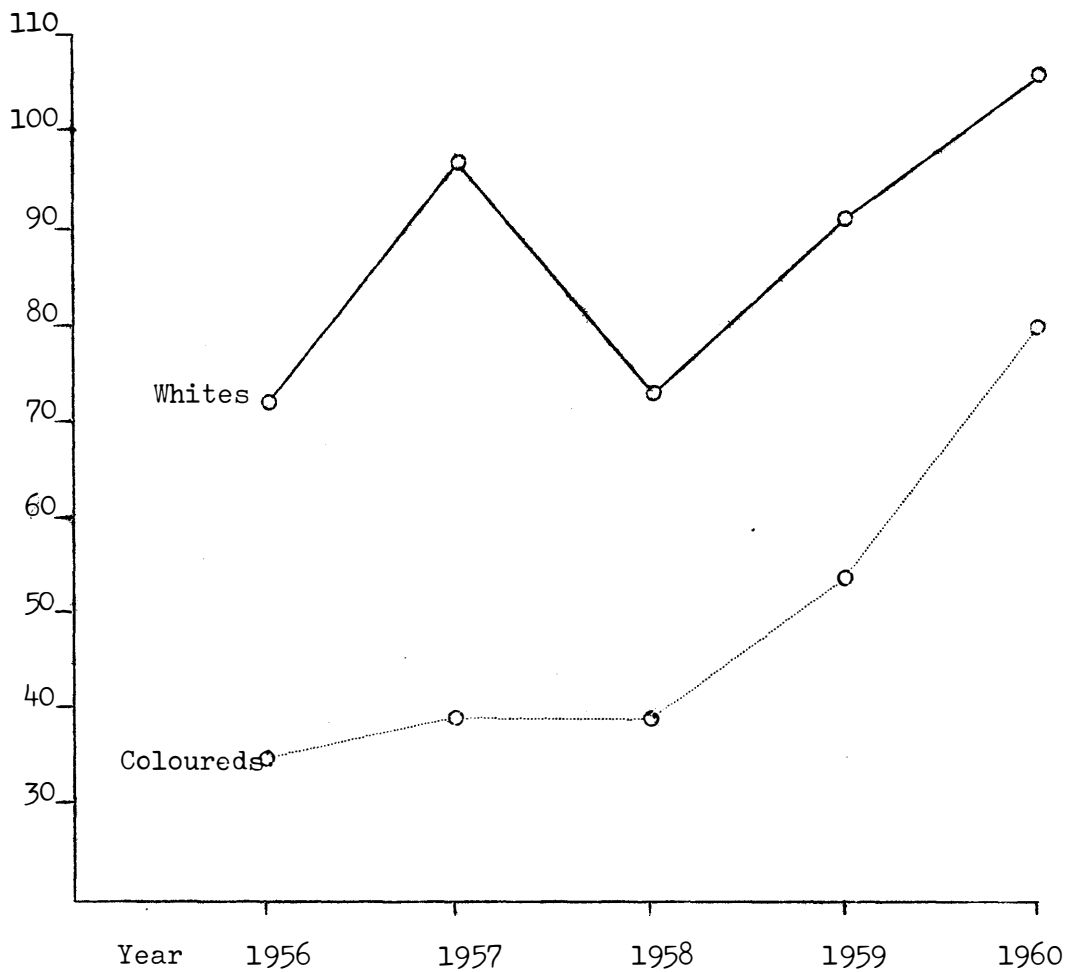




TABLE 48Annual Recruitment : Races : Joiners. 1956 - 1960.

<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	37	6
1957	57	9
1958	57	8
1959	60	3
1960	<u>60</u>	<u>14</u>
TOTALS	271 =====	40 =====

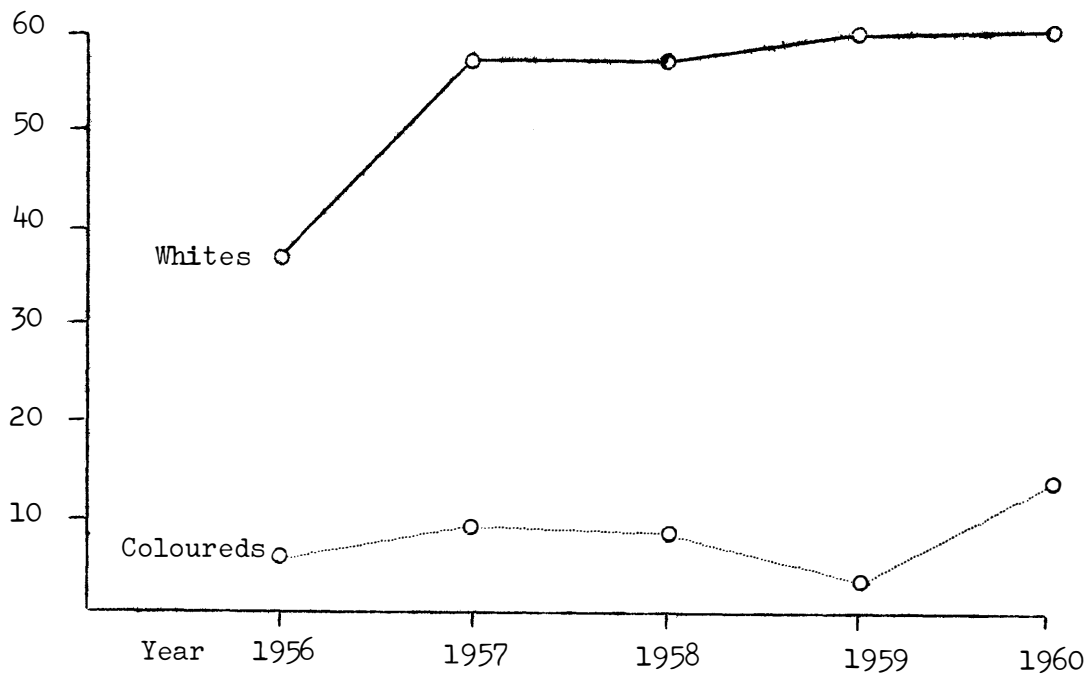
GRAPH XXXV

TABLE 49

Annual Recruitment : Races : Carpenters  
and Joiners. 1956 - 1960.

<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	73	14
1957	29	10
1958	31	14
1959	21	8
1960	<u>49</u>	<u>17</u>
TOTALS	<u>203</u> =====	<u>63</u> =====

GRAPH XXXVI

Apprentices.

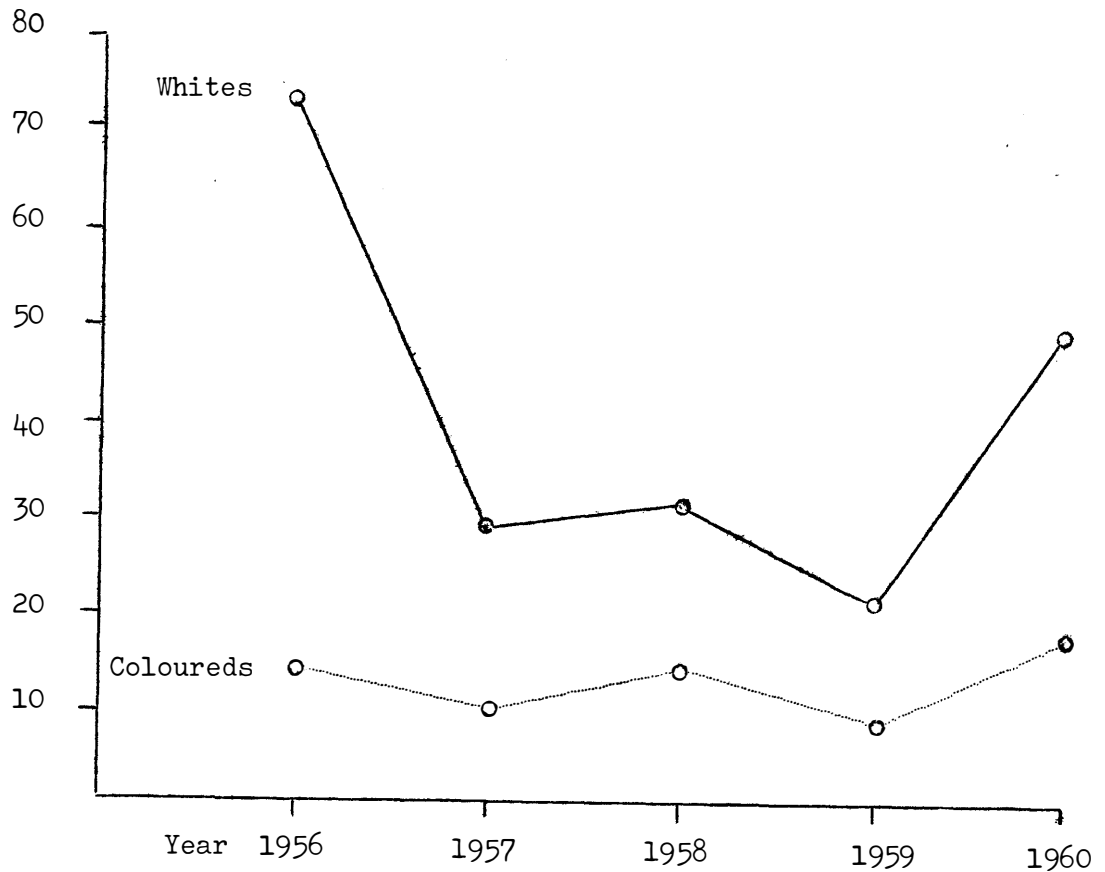


TABLE 50Annual Recruitment : Races : Painters. 1956 - 1960

<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	41	33
1957	50	41
1958	43	46
1959	60	19
1960	<u>78</u>	<u>22</u>
TOTALS	272	161
	=====	=====

GRAPH XXXVII

## Apprentices.

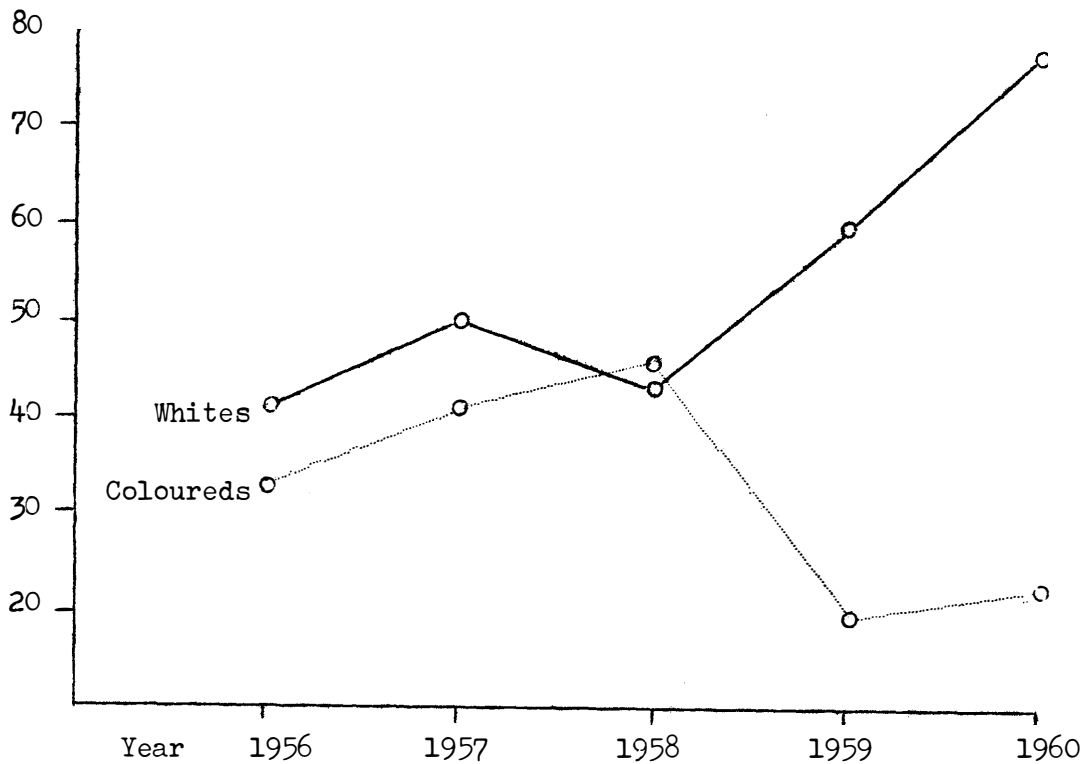
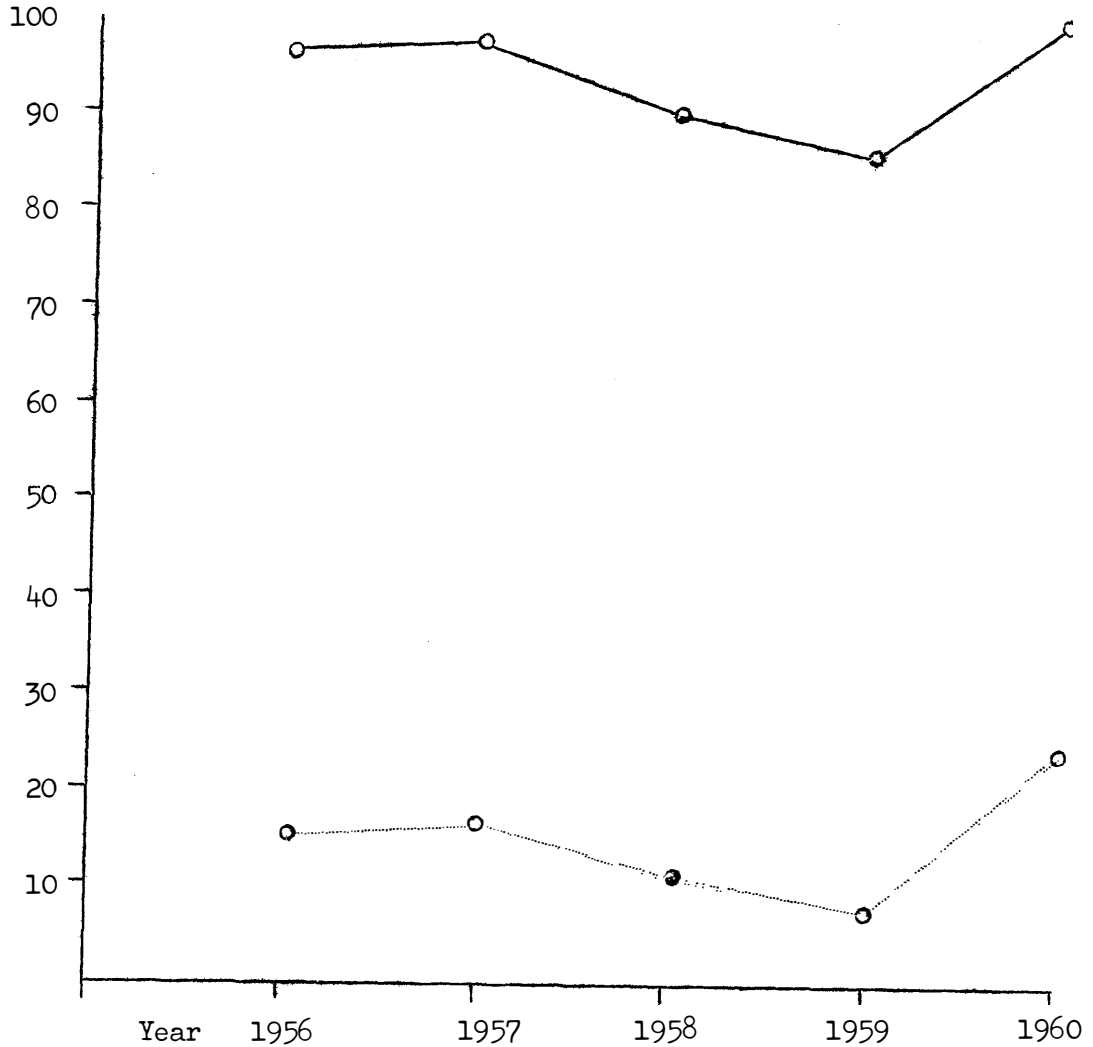


TABLE 51Annual Recruitment : Races : Plumbers. 1956 - 1960.

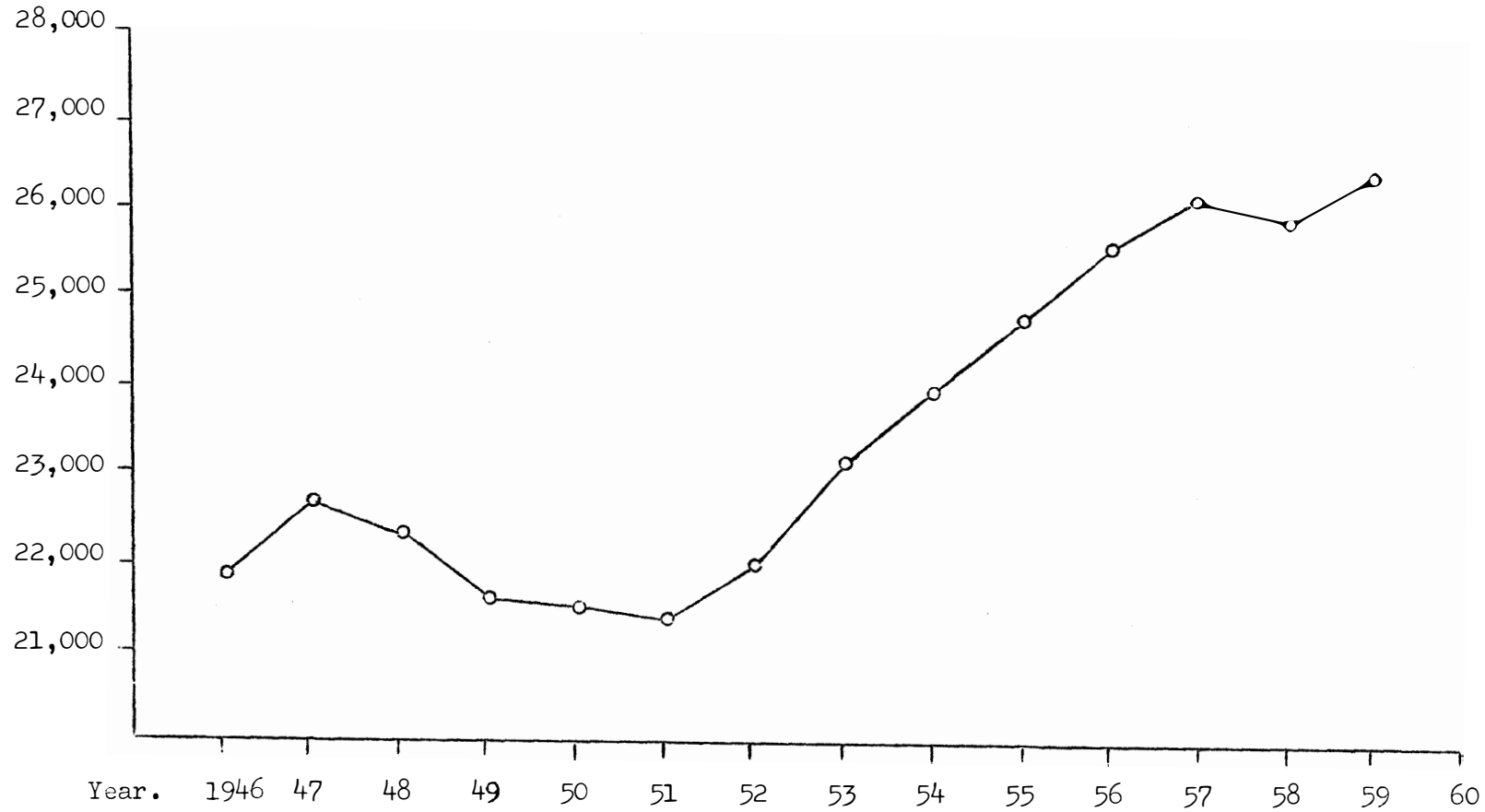
<u>Year.</u>	<u>Whites.</u>	<u>Coloureds.</u>
1956	96	15
1957	97	16
1958	90	11
1959	86	7
1960	<u>100</u>	<u>24</u>
TOTALS	469	73
	=====	=====

GRAPH XXXVIII

Apprentices.



GRAPH XXXIX      Estimated South African White Male Population:  
17 Year old Group. 1946 onwards.



All but one of the trade graphs show a relatively constant or a downward trend i.e. a fall off in recruitment. Even a constant trend (without predominant slope) is not healthy, since the White male population in the age groups covering the ages at which most building apprentices enter the Industry, is rising steadily (see Graph XXXIX). Hence a constant recruitment trend indicates diminishing recruitment in proportion to the apprentice age group population and, in fact, the general population.

The only trade graph to show an upward trend is that for Carpenters. However, this is largely an artefact resulting from legislation determining the trade designations which have been revised from time to time for the various provinces. Thus in certain provinces there was no trade designation "Carpenter" before a certain date, only "Carpenter and Joiner". For this reason a separate graph (XXI) has been drawn, combining all the Woodworking trades and the trend of this graph may be taken as reliable.

It is important to note that although the proportion of apprentices in the Plumbing and Electrical wiring trades appears satisfactory in relation to artisan numbers, recruitment in these trades is not rising and would not be in a position to meet any sudden future demand resulting from accelerated economic expansion.

The race and trade graphs show no marked trend differences between the races except that there appears to have been a greater fall-off in the Painting trade recently amongst Coloureds than amongst Whites.

The graphs showing the races by area are instructive. The recruitment of Whites in the Cape has increased sharply since 1958 whereas the recruitment of Coloureds has been declining since 1956, but shows a sharp increase in 1960. Recruitment in the Transvaal (Whites) has fallen off steadily since 1951. The upward trend in the Free State since 1957 is attributable to apprentices contracting in Welkom. The Bloemfontein figures show a decline. However, trends taken over short periods should not be taken too seriously since graph fluctuations within a short span tend to be random and therefore unreliable. In Natal Coloured recruitment has fallen off; amongst Whites it has declined and then increased.

The most significant and reliable graph is that showing the whole of the sample over the full period studied (Graph XXVI) and this shows a definite fall off in the recruitment of apprentices to the

RECOMMENDATIONS.

1. The importance of keeping accurate and extensive statistics for the control and development of an industry cannot be over-emphasized. Ideally, the following records should be kept by all local Industrial Councils for the Building Industry, each for its own area and on an annual basis:

- (a) Value of building plans passed according to types of construction.
- (b) Value of construction started.
- (c) Value of construction completed.
- (d) Regional population by race and age-groups.
- (e) Net regional and national income.
- (f) For each building artisan, the following information:
  - i. trade
  - ii. year of birth
  - iii. race
  - iv. place, manner and date of qualification
  - v. number of weeks worked in the private contracting sector in the area
  - vi. number of weeks worked in the public contracting sector in the area
  - vii. number of weeks worked outside the area and in what sector
  - viii. number of weeks worked outside the Building Industry.
  - ix. number of weeks unemployed
  - x. number of weeks lost through illness or accident
  - xi. year of withdrawal (benefits surrendered) and reason for withdrawal
  - xii. year of death.

(The information should preferably be recorded on an I.B.M. punched card for each artisan).

- (g) The number of apprentices registered by age, trade education and race.
- (h) The number of apprentices qualifying by age, trade education and race.
- (i) The number of apprentices cancelling by age, trade, education and race

Most of the information in items (a) to (e) above could be obtained with the collaboration of the Bureau of Census and Statistics. Items (g), (h) and (i) would be obtainable from the Department of Labour. Much of the data relating to artisans is already obtained by the Industrial Councils in Johannesburg and Pretoria. Other local Councils do not apparently function in anything like the same manner.

The above information, obtained on a regional basis should be processed annually and co-ordinated and scrutinized in some central office (e.g. Witwatersrand Industrial Council) either by a specially appointed statistician and industrial economist or in collaboration with a body such as the Industrial Economics Division of the C.S.I.R. A report could then be submitted annually to the Federation. This procedure would make possible:

- (a) a relatively accurate prediction, in time, of future trends in recruitment and labour resources;
- (b) an assessment of labour movement and of unemployment;
- (c) an analysis of possible differences between races, age groups and areas with regard to recruitment, movement and labour patterns;
- (d) an assessment of artisan labour wastage through deaths, withdrawals, illness and accident.

This would provide a picture of the present and probable future condition and development of the Building Industry, on a regional and national basis.

The organizational achievement of the Witwatersrand and Pretoria Industrial Councils for the Building Industry, within a relatively short period, suggests that this statistical programme could be implemented with similar efficiency. While many administrative difficulties would be involved, these should not be insuperable.

2. The apparent instability of the artisan working force in the Wits.-Pta. region, together with the impermanency which obtains in the employment of most building artisans, suggests the necessity for a co-ordination of manpower utilization. Over the period 1955 - 1961 the general pattern has been that of  $\frac{2}{3}$  of the registered artisans working for  $\frac{3}{5}$  of the year, on the average; and the hard



core of men working more than 80% of the time over the period is only 27% of the total force. This is clearly an undesirable situation.

The trade unions, the employment bureaux, the Department of Labour, building contractors, public bodies, and the men themselves all contribute to the continual placing of building artisans in jobs, as or after present contracts end; but what would be more desirable is a centralization of these efforts through a single body, co-ordinating the supply of and demand for skilled labour in the Building Industry.

This is a complex problem but it is put forward here for consideration by the National Federation of Building Trade Employers in South Africa.

3. The most serious fact to emerge from the analysis of the apprentice figures is the overall declining recruitment to the Building Industry. At best, in some trades, and over short periods in certain areas, recruitment has maintained a steady figure or increased slightly but this should be seen against a rapidly increasing population and South Africa's need for rapid economic expansion. It is clear that recruitment to the Building Industry is to be described as "static to declining" and rapid steps should be taken to reverse the pattern. The personnel policy which should determine the exact nature of these steps is a problem which lies outside the scope of this study.

4. Since the Bricklaying and Plastering trades show both a high wastage rate and a low proportion of recruits in relation to the other trades, it is suggested that shortages in these two trades might be off-set by encouraging Coloureds to join these trades, at any rate in the Cape and Natal.

5. The trade test pass rate of apprentices is extremely low. Consideration should be given to the causes of failure and steps taken, in the first instance, to ensure that there is no practical incompetence amongst apprentices who have completed their apprenticeship.

6. The general educational level of building trade apprentices is low. Very few of them have technical qualifications of any kind. A minimally trained and educated artisan force will give rise to a number of serious problems: (i) the inability to adapt readily to technical and organizational changes within the Industry; (ii) a lack of initiative and ability required to contribute to the technical development of the Industry; (iii) growing individual dissatisfaction with a job that is necessarily almost entirely static, since the artisan has not the background or training for development - of course, this applies differentially to the various trades, since not all trades present an equal potential for development; (iv) a lack of potential managerial personnel within the Industry itself.

The feasibility of encouraging apprentices to obtain higher educational, and particularly technical, qualifications should be investigated. Alternatively, it may be necessary to encourage youths of higher ability than that of past apprentices (to judge by educational level and the test pass rate) to join the Industry. The **whole question** of selection and training in the Building Industry requires attention.

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