THE DEMOGRAPHIC EVOLUTION OF SURINAM

1920—1970

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VERHANDELINGEN
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VOOR TAAL-, LAND- EN VOLKENKUNDE

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THE DEMOGRAPHIC EVOLUTION OF SURINAM 1920 - 1970

A socio-demographic analysis

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CONTENTS

CHAPTER I

INTRODUCTION

§ 1.1. RESEARCH GOALS AND DEFINITIONS OF CONCEPTS

Surinam has a heterogeneous ethnic population, developed mainly from voluntary as well as forced immigration. Especially since World War II, Surinam's multifaceted structure (the genesis of which is outlined in paragraph 1.5.2., below) has been the subject of sociological research. Various studies of ethnic populations have been completed and published. Such investigations, focusing as they do upon a single group without comparing it to others, carry both advantages and disadvantages. The danger lies in placing an unwarranted emphasis upon the ethnic factor. It may even be viewed as the single most important variable in social behavior, while the influence of such socio-economic factors as class, occupation, income, and urbanization is largely ignored. That these factors nevertheless play their role in Surinam is obvious, as evidenced for example in the growth of a class of Creole merchants and businessmen, a group whose interests are clearly different from those of the Creole laborers and farmers. A similar development has occurred in the Hindustani population. Among the Javanese — Surinam's third-largest ethnic group after the Creoles and the Hindustani — this process has not (yet) taken place. Class differences remain indistinct, and in some cases at least, because of the political and economic needs of certain groups, they have been kept at that stage. Since the realization of some form of social integration is seen as a national goal in Surinam, it is meaningful to focus the attention of social science upon whatever conditions may further the sense of inter-ethnic solidarity among people with common interests. Little is known, for instance, about the more-or-less equivalent socio-economic positions and working conditions of laborers from different ethnic backgrounds, nor do we know whether their similar circumstances lead to feelings of unity.

It is against this background that the relevance of the present work must be measured. Demographic-sociological research was conducted in Surinam from May 1969 to April 1971. Its purpose was to investigate which factors are significant in the demographic development of

Surinam. The analysis compares the three largest ethnic populations. The reason for this attention to ethnicity is twofold: there is considerable information about Surinam's ethnic groups, and the subject itself is intrinsically interesting. But as the concluding chapter stresses, this is definitely *not* meant to imply that ethnicity is the key component to Surinam's demography. The impact of socio-economic variables is traced in spite of the relative scarcity of information on such subjects. It will be noted that these factors have not been applied to the subject matter of every chapter. Their influence is most pronounced in the chapter on birth rates, especially in its historical description and in the section dealing with component analysis. Paragraph 2.3 of that chapter discusses the extent to which the variation in fertility rates is a function of such factors as population density, industrialization, education, religion, and ethnic origin.

The purpose of the investigation is to discover which conditions are associated with the differential population movement among the different ethnic groups since 1951. The term "population movement" refers to everything which describes quantitative changes in population groups by size and age distributions (United Nations 1958: 12b).

The Second (1950) and the Third (1964) General Population Censuses assigned membership in a particular ethnic group to those individuals who were so registered in accordance with their self-identification. The ethnic groups do not form homogeneous entities. Each is differentiated according to life style, status and occupation. The differentiation by occupation is clarified in the final chapter. The ethnic classification of the 1950 census was based upon a questionnaire which asked:

A. "To which of the following national categories do you feel you belong?"

B. "If you feel you do not belong to one of these national categories, what then is your correct category?"

The respondents answered these questions by choosing from the following national categories (Census Topics):

1. Negro	4. Indonesian	7. (Non-tribal) Indian
2. Colored	5. Chinese	8. (Non-tribal) Bush Negro
3. Hindustani	6. European	9. Other

(Non-tribal, in categories 7 and 8, refers to those not living in tribes, and not subject to the authority of a native chieftain.)

In the official publications on the results of the 1950 census, the Negroes and Bush Negroes are combined into one category, Unmixed Black-Colored, while the colored population is classified as Mixed Black-Colored (Census, 1950, Volume 10: 18, 25; Tables 11, 29; Volume 11: 7-11). In later publications based upon the same data, the total Black-Colored category (thus: Negroes, Non-tribal Bush Negroes, and Coloreds) is designated as Creoles or Black-Colored (van der Kuyp, van Lier, Walvis 1959; Schmidtgall 1964). Furthermore, only four national categories are recognized: Hindustani, Creole, Javanese, and Other. The section "Other" is a residual category for Chinese, European, non-tribal Indians, Lebanese, etc. The practice of lumping the latter groups as "Others" is perhaps justified by their small numbers per group. The census of October 31, 1950, counted 2471 Chinese, 2566 Europeans, and 1778 Indians. Because of the consolidation of these heterogeneous groups, future differences in such components as birth and death rates will not be clearly discernible. It would therefore be advisable to treat the ethnic groups separately. On the other hand, subdividing these small populations still further in accordance with age, sex, and region, could result in samples too small to warrant statistical conclusions.

The 1964 census used roughly the same questions and the same classification of ethnic groups. Again respondents were asked to identify their national category. For this enumeration, the groupings Negro, Colored, and Non-tribal Bush Negro were combined into one category, that of Creoles (Instructions to the Census Takers, p. 12). Here, too, there is little difference between the two censuses, since the ethnic groups designated as Creole are the same in both cases.

The First (1921) General Population Census also indicated the ethnic category with which the respondents identified, and used approximately the same categories as the later censuses. Since it does not cover the time span under investigation, little additional attention will be given to it here. Let it suffice to state that because of the uniformity of their questions on ethnicity, the 1921, 1950, and 1964 censuses have delivered comparable data.

Another consideration about the equivalence of these three instruments, insofar as they deal with membership in ethnic groups, lies in the possibility that some persons may have identified with a different category in 1964 than in 1950. The evidence indicates, however, that it is unlikely that the number of such cases could approach statistical significance. The number of inhabitants per ethnic category for the 1964 census differs very little from the number obtained by adding the

figures for the 1950 census to the natural increase for the years 1951-1964 (see § 1.4.4).

January 1951 was chosen as the starting point for the investigation because the first complete information dates back to October 31, 1950, the day of the Second Census. The time span between the First and Second Censuses has been examined, but with less emphasis than the post-1950 period. Another limitation on the research concerns the two tribal populations of Bush Negroes and Indians. The investigation is limited to persons who live within Surinam's contiguously occupied terrain. This territory, which measures 4,739 km^2, covers but a small portion of the total domain of more than 143,000 km^2. The rest of the country — sometimes referred to as "the area of scarce occupation" — is populated mainly by the tribal Bush Negroes and Indians (see map). The 1921 census put their number at 21,000, the same as the total estimated by the 1950 census. The 1964 census counted 32,000 tribal people. The 1921 and 1950 estimates must be considered unreliable, and to a lesser extent that charge also applies to the 1964 data on tribal populations. This is not surprising, in view of the difficulties associated with census taking among these groups (Köbben 1967: 48-51).

In this context, it must be pointed out that since World War II several anthropologists (including Hurault, Kloos, and Price) have collected incidental demographic information during their fieldwork among the Bush Negroes and Indians. These data have not, however, been systematically accumulated for a number of consecutive years. For this reason and because of the doubtful validity of the First and Second Censuses, it was decided to exclude the tribal Bush Negroes and Indians from the investigation.

§ 1.2. RESEARCH METHODS

Chapters 2 through 5 concern fertility, mortality, and migration rates, and explore the degree to which the development of these demographic components parallels that of such factors as family type and age distribution within the population. The results are used to support a theoretical explanation of the patterns of growth in the population. Section 2.3 further applies regression-analysis to the fertility factor, so that variation in the fertility rates of the registration districts (geographic subdivisions of a Government District) can be compared to the other variables. Chapters 4 and 5 deal with immigration and emigration only in a descriptive sense, since the data do not allow further statistical analysis of these subjects.

More detailed descriptions of research methods are incorporated into the relevant chapters.

§ 1.3. TECHNIQUES OF DATA COLLECTION

The materials employed in this investigation were derived not only from existing census data, but from information personally collected from such sources as archives and official vital statistics documents. The accounts were copied not only in the registers and archives of Paramaribo, but in those of other district centers, some more than 200 km. from the capital city. This time-consuming and laborious approach was applied to six districts in order to guarantee the reliability of the material. Furthermore, information published in the official statistical reports, the *Surinaams Verslag,* was recomputed for the period 1920-1949 as a check on accuracy.

One of the many problems associated with the data-gathering process is presented as a case study in Appendix I.

§ 1.4. THE NATURE OF THE MATERIAL

The collected data reflect fertility, mortality, and migration. Since 1900, the Government Service has collected and published records on these demographic variables (*Surinaams Verslag* 1900-1949). These reports are not completely reliable for the period prior to July 31, 1921, the day of the First Census. The reason is that until that time the birth and death figures for the agricultural work forces were based upon the reports of plantation directors, while the figures for the rest of the population were dependent upon reports to the Government Service.

§ 1.4.1. NATURE OF THE FERTILITY DATA

Information on the birth rate was collected for the period July 31, 1921, to October 31, 1950 (the definition of "live birth" used in Surinam and in this study is that found in United Nations 1955: 46-53). The figures in the *Surinaams Verslag* are not complete in all respects. For example, in some years there are statistics for the total country, but not for individual districts. The "Algemeen Bureau voor de Statistiek" (General Office for Statistics, hereafter referred to as GOS) has evaluated the accuracy of the relevant reports in the following terms: "The computed rates of natural increase may be too high or too low because in a number

of cases of both births and deaths, their announcement was omitted" (GOS 1957: 3). Nevertheless, the *Surinaams Verslag* is the sole official source for these decades. It alone is the basis for the GOS figures which were published as "*Suriname in Cyfers* no. 26 en 27" (Surinam in Figures, number 26 and 27), and in the journal *Vox Guyanae* (van der Kuyp, van Lier, Walvis 1959: 137-162).

For the period after 1950, I derived statistical data from the birth records and identity cards of the "Centraal Bureau Bevolkingsadministratie" (Central Office for Population Administration, hereafter referred to as COPA). For this period, some discrepancies were found between the GOS-*Vox Guyanae* figures and the personally collected data, but these were not significant. For 1952, the number of live births was 8,453 according to the GOS, while the investigation could account for only 8,361. This difference of 92 births is correlated with a difference in birth figures of 0.5 $^0/_{00}$. For 1957, the figures of the investigation were higher than the GOS by 374, or 1.64 $^0/_{00}$. This variance concerns cases which the GOS had "lost". But during an earlier census held by government officials, before the loss of some pages of the birth register, these cases had indeed been counted. There is thus no evidence of systematic error.

For every live birth, the COPA prepares a birth-and-identity form which contains a variety of information including:

1. For the child: Volume number, sex, birth date, birth place, religious affiliation, family name, and first name(s).
2. For the father and/or mother: sex, birth date, birth place, family and first names, marital status, domicile and address, religious affiliation, and parity (the total number of children including those born previously).

Codifying the desired information is sometimes difficult:

A. In many cases the data of Creole paternity are omitted.

B. The ethnic affiliation of the parents — and therefore of the child — is not part of the information on the registration forms. There are three ways to correct this difficulty:

1. By means of an inquiry, the parent(s) of each registered birth could be asked what their ethnic affiliation is. This method has a number of drawbacks:

a. Many people can no longer be reached (address unknown, emigrated out of the country, deceased). An earlier investigation (Lamur 1963)

discovered that of the 2,514 males over the age of 15 who had settled in Paramaribo from 1958 through 1962, 40 % could no longer be traced.

b. Each year more than 12,000 children are born. The number of parents to be polled for a project covering 20 years would thus be quite large.

c. It is highly questionable whether such an inquiry would be politically defensible in view of the ethnic character of local politics, and the latent tensions between Surinam's two largest ethnic populations: the Creoles and the Hindustani. In this connection, it needs to be emphasized that politics have had no influence on the collection of demographic information.

2. A second method is to consult the census forms. Here too, a major obstacle is the omission of a number of addresses. And insofar as the 1964 census is concerned, the strips of the census form on which name, address, and birth date are recorded were secret, and were removed as soon as the forms were counted, in most cases. There is thus no way to relate these birth registers to the ethnic information on the rest of the census forms.

3. The method employed in the present investigation is based on the assumption that a person's ethnic affiliation can be deduced from his name. The probability of error in this technique was measured by the following test: All investigators were given identical lists of 100 randomly chosen names. These were names of persons who died in Paramaribo after March 31, 1964. Each investigator was told to classify the names according to ethnic group membership. It was found that there were only four disagreements between the classifications so produced, and the data in the official register of death certificates. The death register was cross-validated against the results of the 1964 census. The small error term implies that this method is valid. The year of the Third General Populations Census, 1964, was chosen for the test because its data are recent and reliable. The choice was limited to Paramaribo because this city has the highest incidence of inter-ethnic marriages. It is, of course, quite difficult to place the ethnicity of the children of mixed marriages by their names: there are Surinam Creoles with Chinese and with Hindustani names, for instance. Without some personal knowledge, one could not hope to derive the ethnicity of such individuals from their names

with any degree of accuracy. Since the experiment was successful in Paramaribo, the place most likely to give difficulties, it must be assumed that the number of errors for the whole country would be lower than the 4 % error term found in Paramaribo. Furthermore, the large numbers with which this research deals are likely to reduce, that is to say, to improve upon this error term of 4 %. Finally, the sizes of the ethnic populations computed by this method for 1963 do not differ significantly from the 1964 census totals (see Table, § 1.4.4), proving the reliability of the method.

§ 1.4.2. NATURE OF THE MORTALITY DATA

The remarks regarding the fertility data in § 1.4.1 above apply equally to mortality figures (for the definitions of mortality statistics used in Surinam and in this research, see United Nations 1955: 53). Self-collected statistics were employed for the 1951-1960 period. Their deviation from the figures published since 1958 by the Ministry of Public Health is minimal. For 1958, the year of greatest disagreement, the death rate was 8.549 $^{0}/_{00}$ according to the Ministry, and 8.192 $^{0}/_{00}$ according to my data. My results give 61 more deaths in 1962 than found in GOS figures, a difference of 0.327 $^{0}/_{00}$. Because my fertility rates were also computed on the basis of self-collected data, I have given preference to my own figures on mortality. The raw data is based upon the register of death certificates of COPA. These contain, among other information, the deceased's name, birth date, sex, residential district, date of death, and cause of death.

The figures for the period after 1960 are those of *Doodsoorzaken* (Causes of Death), a yearly publication of the GOS in cooperation with the Department of Vital Statistics of the Ministry of Public Health. The collection of such information is the exclusive task of that Department. *Doodsoorzaken,* whose categories are based upon "International Statistical Classification of Diseases, Injuries, and Causes of Death" (World Health Organization 1957), lists mortality figures by ethnic group, age group, sex, cause of death, and — since 1965 — District. The sources for these reports are the death notices of the civil Registrar's Office, and Form C, the cause-of-death form which is the medical doctor's report. For a detailed description of death notices and Form C, see Ministerie van Volksgezondheid (1957?). A condensed explanation follows.

For every deceased or stillborn person a medical doctor must complete

a declaration of death or stillbirth, which is filed with the Registrar's Office. This Declaration A is fastened to an Envelope B, into which cause-of-death Form C is to be folded. Declaration A contains the following information: date of death, name, sex, residence, address, age or birthdate of the deceased. Form C contains all the data of Declaration A, plus the following: occupation, ethnic group, cause of death, and civil status. Both documents are to correspond to the family register (an official identification booklet, equivalent in some respects to the birth certificate in the U.S.A.) of the deceased. After it is received by the Registrar's Office, the forms are given the same register volume number. Envelope B, which contains the cause of death data, may not be opened by the Registrar's Office. A death notice is completed on the basis of the information in Declaration A, with additional information, if needed, supplied by the person responsible for reporting the death. Then, normally, documents A and C are sent to the Ministry of Public Health. Occasionally Declaration A is not forwarded. In such cases, a Form D, based upon the information in Declaration A, is forwarded instead. The Department of Vital Statistics then codifies the following information for publication: registration number, age, sex, residence, address, ethnic affiliation, cause of death, and District.

§ 1.4.3. NATURE OF THE MIGRATION DATA

Figures on migration for the period 1922-1950 are published in the *Surinaams Verslag*. Migrants, during this period, were mainly contract laborers who for the most part came from India and Indonesia.

No consideration is given in this investigation to migration figures for the period 1951-1963. The reasons for this are as follows:

1. The figures on migration for this period are not accurate.
2. The information is not classified into the necessary categories: the available data do not specify age, and sometimes omit sex and ethnic group. It is thus not possible to devise an age-distribution pyramid for the total population — including migration, and the statistical category "Women aged 15-44" is unknown. It is therefore impossible to work with fertility figures in this area.
3. Insofar as migration figures are available, they do not appear to have had a major influence upon the size of the population. The crude population growth due to migration for these years (figures rounded to the nearest 100) was:

1951:	800	(GOS 1957)
1952:	400	„
1953:	700	„
1954:	—400	„
1955:	500	„
1956:	—200	„
1957:	—200 to 300	(Office of Rural Development)
1958:	0	„
1959:	100 to 200	(GOS 1957)
1960:	50 to 100	„
1961:	320	(my own data)
1962:	—101	„
1963:	—194	„

The total increase due to migration for the 1951—1963 period, according to these figures, amounted to roughly 1800, which is a yearly average of below 150, which means less than 0.1 % of the population on January 1, 1951. There is, however, a possibility of sex- and age-specific selectivity.

4. It further appears that, in spite of the omission of migration particulars for 1951 through 1963, the number of inhabitants according to the Third Census differs very little from the figure derived by adding the data on natural increase for the years 1951-1963 to the population total of October 31, 1950 (the date of the Second Census). According to the Third Census (March 31, 1964), the total population was 292,205, which means that on December 31, 1963, it was 289,282. On the basis of the Second Census plus the natural increase for the 1951-1963 period, the total population should have been 288,528. The difference of 754 is only 0.2606 % of the 1964 census figures.

5. Migration from the area of scarce occupation to the central area is also of negligible importance to the population size. The reason for this is that the settling of Bush Negroes and Indians in the central area is characterized by its extreme impermanence, at least during the years in question (Lamur 1965: 123-125). Furthermore, both of these ethnic categories fall outside the scope of the present research.

It is thus demonstrable that the migration patterns between 1951 and 1963 did not materially affect the size of the Surinam population.

TABLE 1

The number of Census Tracts by Population Size and District on March 31, 1964

Inhabitants	Par.	Sur.	Sar.	Cor.	Nick.	Mar.	Comm.	Brok.	Total
Less than 100	—	15	12	—	7	—	32	5	71
100-199	—	6	3	—	1	—	13	2	25
200-299	—	4	5	—	—	—	5	—	14
300-399	—	4	2	4	2	—	4	—	16
400-499	—	2	1	—	2	—	2	—	7
500-999	1	16	2	2	5	1	8	1	36
1000-1999	7	11	2	1	5	1	3	—	30
2000-2999	16	8	—	—	1	2	1	—	28
3000-3999	7	2	1	—	2	—	—	—	12
4000-4999	4	3	—	—	—	—	—	—	7
5000-9999	3	4	—	—	1	—	—	—	8
10,000 and over	—	1	—	—	—	—	—	—	1
Totals	38	76	28	7	26	4	68	8	255

Source: The Third General Population Census of 1964.

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200-299	—	4	5	—	—	—	5	—	14
300-399	—	4	2	4	2	—	4	—	16
400-499	—	2	1	—	2	—	2	—	7
500-999	1	16	2	2	5	1	8	1	36
1000-1999	7	11	2	1	5	1	3	—	30
2000-2999	16	8	—	—	1	2	1	—	28
3000-3999	7	2	1	—	2	—	—	—	12
4000-4999	4	3	—	—	—	—	—	—	7
5000-9999	3	4	—	—	1	—	—	—	8
10,000 and over	—	1	—	—	—	—	—	—	1
Totals	38	76	28	7	26	4	68	8	255

Source: The Third General Population Census of 1964.

large enough to warrant statistical manipulation and interpretation. However, demographic data for groupings of census tracts do not exist, either. Only for the day of March 31, 1964, have data been reported by census tracts, and only for 1964 can the tract be used as a unit of analysis. When compared to Districts, census tracts are relatively homogeneous in socio-economic structure, and therefore they are used to explain fertility as it results from a number of variables. In Chapter 2.3, these units are subjected to regression-analysis, to allow a comparison of the fertility rates of the various census tracts in relation to other variables.

§ 1.4.4. RELIABILITY OF THE MATERIAL

The purpose of this section is to test the reliability of the basic data used in this research: the results of the 1950 and 1964 censuses, fertility, mortality, and migration. Most published tests of reliability appear to suffer from certain handicaps (United Nations 1952; 1954; 1955). Therefore a criterion is needed which least interferes with the purpose of this research, which is the differential population growth among the various ethnic groups.

A. *The Census Material*

The "balancing equation" method was chosen to test the reliability of the census totals because it affords more quantitative indices of the degrees of confidence than do other statistical tests (United Nations 1954: 173-191; 1955: 4-18; 1958: 104-111). This method is based on the axiom that the difference between the totals of two censuses held on different dates must be identical to the population change in terms of birth, death, and movement between these dates. In other words, the census totals of any enumeration must equal the expected total, which is the total of a previous census plus the population increase or decrease since that date, as computed through changes in fertility, mortality, and migration.

This ideal situation may nowhere have been achieved, since some errors creep into any census. However, if it is found that a census total deviates significantly from the expected total, it may be assumed that there are biases, registration errors, in one or more of the main components of population growth or in the totals themselves. This does not mean that it is necessarily safe to assume that the absence of such large deviations demonstrates the material's reliability: errors may not be obvious because of compensating trends (see Table 2 page 14).

TABLE 2

Variation in Population Estimates for the Major Ethnic Groups, by Method of Computation

Ethnic Group	Population on Dec. 31, 1950			Population on Dec. 31, 1963		
	1950 census	1921 census plus natural increase	Difference	1964 census	1950 census plus natural increase	Difference
Creole	71,678	82,528	— 1,085	113,929	113,657	272
			— 1.5%			0.23%
Hindustani	62,570	67,016	— 4,446	111,409	111,438	—29
			— 7.1%			—0.02%
Javanese	35,308	37,992	— 2,684	48,053	49,211	—1,158
			— 7.6%			—2.40%
Surinam Total *	178,078	195,249	—17,171	289,282	288,528	754
			— 9.6%			0.26%

* Includes other, smaller ethnic populations.

A comparison between the observed total of the Second Census (178,078) and the expected total based on the First Census plus natural increase (195,249) shows a difference of 17,171, an error of almost 10 % of the 1950 census total. We may assume, provisionally, that registration errors occurred in one or more of the population groups. It must be kept in mind, however, that this error refers to the unusually long accumulation of 30 years. Only after the three components — fertility, mortality, and migration — have been individually tested, will it be possible to arrive at a definite conclusion.

In comparing the Second and Third census, the differences between the observed total of 289,282 and the expected total of 288,528 amount to only 0.26 % of the 1964 total. Variance is highest for the Javanese population, but even here the error of 2.4 % may be considered minor. To the United Nations, such errors as 0.8 % for Puerto Rico and 1.8 % for Thailand are considered acceptable (United Nations 1955: 14). In view of the fact that these error terms refer to total populations (2,211,000 for Puerto Rico, 17,443,000 for Thailand), it may be assumed that acceptable levels of deviance will lie still higher for separate population components. Therefore, even the error in the Javanese totals is tolerated, especially since the deviation accumulated over the comparatively lengthy period of 13 years.

Census aspects other than totals may be tested for reliability. One factor which is meaningful in the context of the present research is the division of the population by age and sex. There are various ways to express confidence indices in these categories. The argument against most of these is that they do not so much measure general reliability as the occurrence of "digit-preference" (the tendency among respondents to report a specific age such as 40 rather than the actual age of 39 or 41), which results in an over-representation of certain age categories (United Nations 1955: 40-43). One method which avoids this and other biases in counting and registration is the "United Nations Secretariat Method" (1952: 59-79). This is used to measure the actual enumeration of the population. One of its advantages is its applicability to age groupings as well as to specific age levels, while other methods are usually restricted to the latter statistic.

Essentially, the United Nations method postulates that the "age-accuracy-index" is a yardstick for the reliability of census materials. Expressed in formula, the index is:

$$3 \times \text{sex score} + 1 \times \text{age score for males} + 1 \times \text{age score for females.}$$

The sex score = The mean of the differences between two successive sex ratios regardless of sign (see Appendix II), where:

$$\text{the sex ratio} = \frac{\text{males}}{\text{females}} \times 100.$$

The age score = The mean of the deviations from 100 of each age ratio regardless of sign, where (for a given age group, say 5-9 years of age):

$$\text{the age ratio} = \frac{\text{5—9 years}}{\text{1/2 (0—4 years + 10 — 14 years)}} \times 100.$$

An age ratio of 112 means that the age group in question has 12 % more members than would be expected on the basis of the neighboring age groups. The U.N. does not apply this method to age groups of 70 years or above, because of the importance of incidental factors in such groups in the context of their small numbers.

Regarding the application of this method, the U.N. considers a census reliable when the coefficient of the index is 20 or less, less reliable when the indicator ranges from 20 to 40, and unreliable when it exceeds 40.

Before the testing of the Surinam material can be discussed, it is necessary to make two limitations of the method explicit. The first concerns the nature of the device. Although the index measures the intensity of irregularities in the age and sex distributions, the test does not indicate whether these irregularities result from errors in registration (unreliability) or from accurate reports of age- and sex-specific migration and mortality figures. For example: If the test of a population produces a high index, it only means that certain age groups are over- or under-represented. It must not be assumed automatically that great numbers of respondents reported their ages inaccurately. That is to say, discrepancies in the representation of certain age groups do not prove census error. It is possible that the anomalies result from the arrival or departure of large numbers of persons within a narrow age range. In such a case the data *is* reliable, in spite of the high coefficient. In order to interpret the Surinam data, it is therefore mandatory that some of the country's unique demographic processes are understood. An effort will be made to trace selective processes by comparing two successive censuses in regard to the age and sex factors.

Apart from selective influences, the total size of the population can influence the index: the smaller the population, the greater the effect of random factors. The U.N. therefore advises that a corrective constant

be applied to each computed index. The numerical values of this constant for different populations are given in Table 3.

Consider a case where the test of a population of 100,000 delivers an index of 25. On this basis alone, one could conclude that the census was less than totally reliable, because this indicator lies between 20 and 40. However, in view of the "small" size of the population, it is not impossible that the high (that is, the negative) index results from random causes which are related to the small population size. In order to minimize the disruptive aspects of population totals, the U.N. formulation computes the corrected rates for universes of different sizes (see Table 3).

In actual use, Table 3 offers two possibilities: those corresponding to the column marked "1,000,000", and those corresponding to the column labeled "Infinity". If it is assumed that in a population of 1,000,000 the influence of accidental factors randomizes out to zero, then this means that for populations of 1 million or more the coefficient of the index is reduced by zero, that is, is not corrected. This assumption also implies that for a sample size between 600,000 and 999,999, the value of the indicator is reduced by one point. The alternate possibility is to assume that only an infinitely large population is sizable enough to nullify the influence of random factors. On this basis, according to the U.N. method, the derived index for a population of 1 million is to be reduced by three points, and the next smaller category (600,000 to 999,999) by four.

Finally, it must be noted that the correction is applied only in cases where the statistics on two or more groups are compared. Other technical details, including the manner in which the constants were derived by regression analysis, can be found in the relevant publication (United Nations 1952).

The application of this method to the problem of the reliability of the Surinam censuses gave the following results. The computations (see Appendix II) show that the age-accuracy index for the 1950 census is 22.4, indicating a relatively low level of confidence. However, this high indicator is partly the result of age- and sex-specific migration, which lasted until 1940. This influence of migration appears not only from a comparison with the 1964 census, but through the fact that for the Creoles the census is reliable (index = 11.4) while for the two immigrant groups, the Hindustani and the Javanese, the index falls outside the limits of confidence.

For the 1964 census the indices for the total population and for the

TABLE 3

Age Ratio Adjustments for Different Population Totals, by Assumption of Random Factor Nullification

Population Size	Assumption A: Over 1,000,000	Assumption B: Infinity *
Over 10,000,000	0 points	0 points
6,000,000—9,999,999	0 „	1 „
3,000,000—5,999,999	0 „	2 „
1,000,000—2,999,999	0 „	3 „
600,000— 999,999	1 „	4 „
400,000— 599,999	2 „	5 „
290,000— 399,999	3 „	6 „
220,000— 289,999	4 „	7 „
170,000— 219,999	5 „	8 „
136,000— 169,999	6 „	9 „
111,000— 135,999	7 „	10 „
93,000— 110,999	8 „	11 „
78,000— 92,999	9 „	12 „
67,000— 77,999	10 „	13 „
58,000— 66,999	11 „	14 „
51,000— 57,999	12 „	15 „
45,000— 50,999	13 „	16 „
40,000— 44,999	14 „	17 „
36,000— 39,999	15 „	18 „
32,000— 35,999	16 „	19 „

* Column A assumes that the influence of random factors will disappear in a population of one million. Column B assumes that only in infinitely large populations are random factors nullified.

Source: United Nations 1952.

Creoles remain below 20, those for the immigrants above that level. The same remarks apply here as for the Second Census. That the enumeration is indeed reliable not only for the total and the Creoles, but for the Hindustani and the Javanese, is shown by the fact that the high indicators are directly related to age- and sex-specific migration. In the case of age ratios, the 1964 census shows that the number of men aged 50-54 is "excessive" when compared to neighboring age groups. This "excessive" figure can be traced back to an equally "excessive" one in the 1950 census for the age group 35-39. This indicates age-selectivity. The relatively large number of males aged 50-54 in 1964 causes a high age ratio and three high "deviations from 100", to wit, the age group in question and its two neighbors (see Table 75, Appendix II). The same observations apply to the age group 35-39 for the 1950 census, although in this case there is a partial nullification because the bordering age group 40-44 also shows a high age ratio. In 1964, the high age ratio for males 65-69 is similarly explained by the age group 50-54 in the Second Census, and the 60-64 group in 1950 is justified by the same process.

In the area of sex ratios for the Third Census, the high ratio of the group aged 50-54 is again noted. This results from a high sex ratio in the group aged 35-39 in 1950. Its consequences are high consecutive differences for the groups aged 35-39 and 40-44 in 1950. Again, the high sex ratio for the group aged 65-69 in 1964 is derived out of that for the group 50-54 in 1950. The same logic applies, although to a lesser degree, in analyzing the sex ratios of the groups aged 55-59, 60-64, and 65-69 in 1950. For these categories, the selective influence of migration factors has become difficult to trace in the age-pyramid of 1964.

In conclusion, it is suggested that both instruments, the Second Census of 1950 and the Third Census of 1964, are reliable even where they deal with the Hindustani and the Javanese. The 1921 census was not tested because it did not offer data on age. Its reliability will be discussed after the tests of fertility, mortality, and migration have been described.

The application of a quite different measure to test the reliability of the birth and death figures, the technique of the stable population, was not justified because the Surinam material violates the constant-growth prerequisite of that test (United Nations 1967: 12, 13, 46, 47).

B. *Fertility*

The accuracy for the fertility figures may be considered as established, for the following reasons:

1. All fertility-related data for this research were collected from the population registers of the District governments. This extremely time-consuming method guarantees accuracy. Furthermore, the data in *Surinaams Verslag,* one of the major sources, was recomputed.
2. Totals for Surinam were compiled from the District statistics, and compared to the totals published in official records.
3. Each birth, when announced by relatives or others, is registered by the District concerned, and is noted by name on a family form or identity card. This procedure is repeated at a central agency in Paramaribo, the COPA.
4. The occasional case of over- or under-enumeration is usually discovered in the context of normal official functions such as the yearly "counting" of the population in each administrative province.
5. The sex ratios constitute an independent check on the dependability of the fertility data. If they lie within the limits which the U.N. accepts, 102-107, then the criterion for reliability has been met. It must be noted that the U.N. does acknowledge that ratios larger than 107 or smaller than 102 are possible (United Nations 1955: 20). Blanc (1962: 40) also admits that such ratios can be realistic: "En gros, le rapport de masculinité à la naissance (nombre de naissances masculines pour 100 naissances feminines) s'établit aux environs de 103-107 pour les naissances vivantes." For Surinam during the period 1923-1960, the sex ratio fell outside the 102-107 limits in 16 of the 38 years, as seen in Appendix III, Table 83. These 16 cases do not, however, necessarily point to inaccuracies in the fertility data, because the excesses may be caused by incidental factors associated with the low number of births. For this reason, the 16 ratios were subjected to a correction derived from a formula used by Blanc. On the basis of this equation (Blanc 1962: 167), the confidence level for a number of births is represented as follows:

$g \pm \sqrt{n}$, where n = the number of births, and

$g = n \times \frac{105}{100 + 105} = n \times 0.512$, the theoretical number of male infants.

After application of the correction factor, 10 of the 16 ratios appear to satisfy the criterion of reliability (see Appendix III, Table 84), but the other six do not. Still, their failure does not prove that the fertility data for these six is unreliable, as the following reasons indicate:

a. As described earlier, the United Nations noted that sex ratios at birth may vary beyond the usual limits. This view is bolstered by the findings that the magnitude of sex ratios in a population may change as a function of such factors as birth control, birth order, and welfare (Lampe 1952; 1955: 240-246; Mijers 1954).

b. Even for the Netherlands with its extremely reliable population statistics, sex ratios have been observed which exceed the customary 102-107 limits. This is illustrated in the following ratios for some Dutch communities of various sizes. The ratios were calculated on the basis of birth statistics derived from the provincial registers of various provinces:

Hoensbroek	1964:	96	Eindhoven	1948:	110
Nijmegen	1961:	99	Nijmegen	1952:	110
Eindhoven	1963:	99	Middelburg	1964:	114
The Hague	1960:	108	Vlissingen	1963:	119
Eindhoven	1964:	108			

The foregoing refers only to the reliability of fertility data derived from sex ratios for the period 1923-1960. The post-1960 period does not require such ratio-checks because its data are reliable.

6. A different reliability test assumes that the crude birth rate may be no higher than 5 %, but here, too, exceptions have been noted (Bourgeois-Pichat 1967: 160, 163; Smith 1961: 102; Tabbarah 1971: 271, 272; United Nations 1955: 21). Only for the Hindustani have there been measures above the 5 % level for some years.

7. The fertility trend, another criterion used by the United Nations, (1955: 200-208; 1956: 23) shows a gradual development for Suriname.

On the basis of the foregoing, especially the first point, it may be concluded that the fertility data are, indeed, reliable.

C. *Mortality*

Most of the comments about confidence in the fertility material apply equally to the mortality data, as the following illustrates:

1. For the period up to 1960, the data were collected from the continuous population registers. The post-1960 data comes from

publications by the Department of Vital Statistics of the Ministry of Public Health.

2. My own figures and those of the Department were compared for the overlapping period 1958-1960, as a check on accuracy.
3. Each reported death is registered by the District authorities; after the affirmation by the medical doctor in charge, the name of the deceased is struck from his family card or identity card. The same procedure is followed at a central installation in Paramaribo, the COPA.
4. The rare cases of over- or under-enumeration of mortality are normally discovered in the yearly "count" of the population in each administrative province.
5. The usually valid principle that in a normal distribution the death rate for males is higher than for females, cannot be tested in the case of Surinam. Because of the age-selective factors of immigration there are more older men than women. A comparison of the death figures is similarly of little use.
6. Death rates below 0.8 % seldom occur under normal circumstances, according to the United Nations. Their occurrence in Surinam does not reflect on the reliability of the data. For some years, death rates of 0.7 and 0.8 % have been noted, but these figures are not standardized for the population for a particular year or a particular area.
7. The mortality trend, like the fertility trend, shows a gradual development. The mortality data must be accepted as reliable on the same grounds as the fertility data.

D. *Migration*

Insofar as they are available, the migration data were accumulated from the transcripts of the *Surinaams Verslag* for 1922-1949, and from the register of "Arrivals and Departures" for the post-1949 period. All persons who leave or enter the country, regardless of the duration or purpose of their stay, are registered by the Aliens Branch of the Ministry of Justice. This office therefore has at its disposal a complete listing of persons who have migrated into or out of Surinam. This listing was used to check the reliability of the continuous registers I transcribed, and where necessary, to complete them. The population registers appear to be quite accurate, except for the period between 1950 and 1963.

For those years, the data have not been broken down into categories, and for the available material the information on age, sex, and ethnic group often are omitted. Insofar as migration figures are encountered, they appear to have had little influence on the size of the population (see § 1.4.3). It is possible that migration did have an effect on the age or sex distribution of the population. Unfortunately, the data do not allow an investigation of that eventuality. The foregoing discussion of the reliability of the data on external migration is equally valid for the migration between Surinam and its eastern and western neighbors. It is possible that unregistered cases of migration exist, but their number must be trifling.

We may sum up the reliability of the material of this study as follows. The data on fertility, mortality and migration have been shown to be trustworthy. It was shown that when the Second Census of 1950 was added to the population increase due to birth, death and movement between 1950 and 1964, it matched the figures of the 1964 census. On this basis, both the Second and Third Censuses must be accepted as accurate.

The same test when applied to the First Census does not give an accurate figure, but one which is 17,000 higher than the total counted in the 1950 census. Since the Second Census was shown to be accurate, and the registration statistics since the First Census are also reliable, it follows that the 1921 census overestimated the population by about 17,000. There are other indicators of this same inaccuracy. Fertility figures based on the 1950 census show a more gradual change (from 3.9 to 4.2 %) than those based upon the First Census (3.7 to 4.2 %) for the years 1950 and 1951. Birth rates based on the 1921 census show the 1950 figures to be relatively low, meaning that the population was smaller that year (and the other years) than expected. On the assumption that the First Census totals were too high, new population totals were computed for the period 1921-1949. These are based on the figures of the 1950 census, accepting the population changes for that period as accurate. The results of this calculation, beginning in 1950 and working back to 1921, are given in Table 58.

It may be remarked that Surinam is always considered one of the underdeveloped countries. In many respects this is justified. But insofar as demographic data are concerned, Surinam is equal to the developed nations.

According to Harewood (1971), the data for the English-speaking Caribbean countries with which Surinam is compared are also reliable.

Most of the countries have a reasonably satisfactory series of population census reports, with the exception of Haiti. But current vital statistics are not satisfactory for the three republics (Cuba, Haiti, and the Dominican Republic), while reasonably accurate international travel data are available only in the (British) Commonwealth Caribbean (Harewood 1971: 294).

And later,

It is believed that after more than a century of vital registration it is unlikely that there is any serious under-registration of births, death, or marriages in the Commonwealth Caribbean. This does not mean that any of the countries concerned have necessarily achieved one hundred per cent registration, but certainly for purposes of demographic analysis, all available tests indicate that the vital records are sufficiently complete and accurate (Harewoord 1971: 301).

§ 1.5. A SURVEY OF THE SOCIETY

§ 1.5.1. THE COUNTRY

Surinam lies on the north-east coast of South America between 1°5′ and 6°7′ North latitude and 53°30′ and 58°2′ West longitude. In the West it borders on Guyana, in the East on French Guyana, and in the South on Brazil. The four major rivers — the Corantijn, the Saramacca, the Suriname, and the Marowijne — flow from the South to the Atlantic Ocean in the North. Its area (including a so-called "disputed territory" of some 19,000 square kilometers) covers 143,000 km^2 (54,200 mile^2). Surinam has a tropical and humid climate. In the coastal areas the mean daily temperature is about 27° Centigrade (81° Fahrenheit), and the noctural mean about 23° C (73° F).

§ 1.5.2. ORIGINS OF THE ETHNIC GROUPS

The aboriginal inhabitants of Surinam are Indians (for further data on ethnic origins, see van der Kuyp, van Lier, Walvis 1959: 123). Negroes were imported from Africa, to work on the plantations, as early as 1650. Although the slave trade was prohibited in 1814, it lasted until 1826. During these 175 years, some 300,000 to 350,000 Negroes were imported. When slavery was abolished in 1863, the total number of emancipated Negroes was 36,902, and the total population 52,963. The estimate of the total number of imported slaves is based upon the contractual agreement between the West India Company, the city of

Amsterdam, and Governor van Sommelsdijck in 1682. This called for the minimum yearly import of 2,500 slaves (Hartsinck 1970: 638-740; Stedman 1813: 290). The profit motive on which slavery was based makes it likely that this quota was achieved in most years. From 1682 to 1814, there must thus have been at least 330,000 involuntary black immigrants. For the period after the prohibition of the slave trade, the number of new slaves dropped to 1,000 per year, until in 1826 improved methods of registering slaves made it almost impossible to smuggle slaves into Surinam (van Lier 1971: 125; Teenstra 1833: 59; Wolbers 1861: 546).

Because the emancipated Negroes were unwilling to continue working on the plantations, and because of their low rate of natural increase, there was a serious shortage in plantation laborers after 1863. In order to fill the need, contract laborers were brought to Surinam.

From 1853 to 1872, some 5,400 immigrants arrived: 500 Portuguese from Madeira, 2,500 Chinese, and 2,400 West Indians from Barbados. After 1869 both China and Portugal closed their harbors to emigrants. In Surinam, these two groups did not adjust well to plantation labor. After their contracts were ended, these immigrants turned to store-keeping and trade, and in time many returned to their homelands.

Between 1872 and 1916, 33,824 contract laborers were imported from what was then British India. Of this number, 11,350 returned to India while the rest settled as independent farmers.

From 1853 to 1933, 33,299 contract laborers immigrated from the island of Java in what was then the Dutch East Indies. Of this number 7,229 were repatriated. Some of the remaining Javanese stayed on the plantations, and the rest became independent farmers.

After the Second World War, the Caribbean again became a source of immigrants. In 1948 a group of 25 families from St. Lucia and another group of 25 families from Barbados came to Surinam. This experiment failed: in 1950 all but five families had returned to the islands.

In 1845, 400 Dutch farmers settled in Surinam. This attempt at colonization also failed. Nearly half of these Dutchmen died of tropical diseases. The rest settled in the neighborhood of Paramaribo to raise cattle.

There have been numerous other colonization attempts (Verkade-Cartier van Dissel 1937). These will not be discussed here, since they did not affect the ethnic structure of the society, at least not for the large groups which are our concern here.

§ 1.5.3. DEMOGRAPHIC SURVEY

The total population of Surinam in December 31, 1963, was 289,282, exclusive of tribal populations. Of this total 144,549 were male, and 144,733 female. The distribution according to ethnic group and District, sex, and age is found in Tables 4-9.

Table 10 illustrates the distribution of the work force by sector of the economy on March 31, 1964.

§ 1.5.4. PER CAPITA INCOME

Table 11 gives an overview of Surinam's national and per capita income.

§ 1.6. OUTLINE OF THE RESEARCH

Population growth is a function of four factors: fertility, mortality, immigration and emigration. Each of these is examined in a separate chapter. Chapter 2 discusses ethnic variations in fertility, and attempts to identify the elements responsible for the variations. Chapter 3 analyzes the differences in the mortality levels. Immigration and emigration are discussed respectively in Chapters 4 and 5. The final chapter endeavors to give a general overview of Surinam's demographic evolution as it resulted from the four vital factors.

TABLE 4

Population by District, Ethnicity, and Sex. December 31, 1963

	Creole		Hindustani		Javanese		Indian		Chinese		Europ.		Other		Unknown		Total		
District	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Total
Paramaribo	31904	35688	12624	12671	3877	3985	613	723	2100	1740	1082	1124	785	843	55	48	53040	56822	109862
Suriname	15161	15398	27402	26928	9369	8720	447	463	391	316	783	782	474	441	200	165	54227	53213	107440
Nickerie	3037	2795	9057	8730	2439	2402	81	100	169	130	154	133	36	48	0	0	14793	14338	29311
Coronie	1702	1645	21	26	173	174	—	3	30	15	1	3	7	7	0	0	1934	1873	3807
Commewijne	916	716	3391	3309	5739	5442	110	79	57	38	48	38	42	37	0	0	10303	9659	19962
Saramacca	450	387	3370	3228	1685	1621	28	35	38	30	12	10	18	10	0	0	5601	5321	10922
Marowijne	1722	1556	291	267	1175	1129	126	137	108	78	51	47	83	60	0	0	3556	3274	6830
Brokopondo	676	176	88	6	83	40	7	0	11	0	15	10	35	1	0	0	915	233	1148
Total	55568	58361	56244	55165	24540	23513	1412	1540	2904	2347	2146	2147	1480	1447	255	213	144549	144753	289282

Source: The Third General Census of 1964.

TABLE 5

Surinam's Ethnic Composition by District, in Percentages, on December 31, 1963

District	Creole	Hindustani	Javanese	Indian	Chinese	European	Other	Unknown	Totals
Paramaribo	61.5	23.0	7.1	1.2	3.4	2.0	1.4	0.0	99.6
Suriname	28.4	50.5	16.8	0.8	0.6	1.4	0.8	0.3	99.7
Nickerie	19.8	60.6	16.5	0.6	0.9	0.9	0.2	—	99.5
Coronie	87.9	1.2	9.1	0.0	1.1	0.1	0.3	—	99.7
Commewijne	8.1	33.5	56.0	0.9	0.4	0.4	0.3	—	99.6
Saramacca	7.6	60.4	30.2	0.5	0.6	0.2	0.2	—	99.7
Marowijne	47.9	8.1	33.7	3.8	2.9	1.4	2.0	—	99.8
Brokopondo	74.2	8.1	10.1	0.6	0.9	2.1	3.1	—	99.1
Totals	39.3	38.5	16.6	1.0	1.8	1.4	1.0	0.1	99.7

TABLE 6

Percental Distribution of Surinam's Ethnic Groups per District, December 31, 1963

District	Creole	Hindustani	Javanese	Indian	Chinese	European	Other	Unknown	Totals
Paramaribo	59.3	22.7	16.3	45.2	73.1	51.3	55.6	22.0	37.9
Suriname	26.8	48.7	37.6	30.8	13.4	36.4	31.2	77.9	37.1
Nickerie	5.1	15.9	10.0	6.1	5.1	6.6	2.8	—	10.1
Coronie	2.9	0.0	0.7	0.1	0.8	0.0	0.4	—	1.3
Commewijne	1.4	6.0	23.2	6.4	1.8	2.0	2.6	—	6.9
Saramacca	0.7	5.9	6.8	2.1	1.2	0.5	0.9	—	3.7
Marowijne	2.8	0.5	4.7	8.9	3.5	2.2	4.8	—	2.3
Brokopondo	0.7	0.0	0.2	0.2	0.2	0.5	1.2	—	0.3
Totals	99.7	99.7	99.5	99.8	99.1	99.5	99.5	99.9	99.6

TABLE 7

Population by Age, Ethnicity, and Sex. December 31, 1963

Age	Creole		Hindustani		Javanese		Indian		Chinese		European		Other		Unknown		Total		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Total
0	2221	2120	2745	2555	978	866	49	51	76	62	57	54	51	44	87	72	6264	5824	12088
1	2192	2129	2543	2510	886	868	44	61	85	74	68	66	58	60	54	39	5930	5807	11737
2	2197	2061	2458	2396	842	820	46	38	75	49	61	55	61	40	27	32	5767	5491	11258
3	2156	2020	2234	2212	750	744	47	55	65	65	56	59	47	50	14	20	5369	5225	10594
4	2071	2050	2413	2312	843	777	56	29	62	62	64	62	55	50	10	10	5574	5352	10926
5— 9	9251	9159	9626	9679	2164	3123	231	246	332	339	254	298	209	191	21	14	23088	23049	46137
10—14	7312	6881	7450	7276	2410	2307	204	209	306	302	179	205	155	173	8	4	18024	17357	35381
15—19	5329	5213	5589	5505	1643	1701	143	182	239	230	88	107	110	107	4	5	13145	13050	26195
20—24	3456	3719	4146	4427	1503	1532	97	138	234	179	81	98	88	93	2	1	9607	10187	19794
25—29	2911	3476	3528	3619	1646	1663	111	118	254	159	141	164	79	89	2	4	8672	9292	17964
30—34	2807	3215	2990	2999	1647	1715	87	107	229	163	222	246	111	115	7	—	8100	8560	16660
35—39	2606	2928	2486	2445	1136	1079	89	75	181	143	190	136	93	105	—	1	6781	6912	13693
40—44	2318	2476	1930	1828	699	721	45	62	145	116	186	156	70	67	2	1	5395	5427	10822
45—49	1970	2139	1585	1613	380	372	39	41	109	93	135	109	63	48	—	—	4281	4415	8696
50—54	1733	1923	1098	1003	1180	816	25	33	108	87	123	88	59	59	1	2	4327	4011	8338
55—59	1410	1806	880	743	637	798	25	17	109	68	91	69	34	31	—	—	3186	3532	6718
60—64	1099	1419	612	507	753	759	15	22	93	50	67	43	35	35	—	2	2674	2837	5511
65—69	806	987	370	264	1103	996	15	10	60	26	34	32	27	31	5	—	2420	2346	4766
70—74	602	990	326	213	494	300	4	6	47	21	22	41	20	21	—	1	1515	1593	3108
75—79	418	713	254	123	236	151	6	8	25	19	14	22	6	10	2	—	961	1046	2007
80—84	212	394	62	43	106	82	2	1	7	14	5	16	8	7	—	1	402	558	960
85 and older	96	250	33	23	46	43	1	4	4	4	2	12	4	9	—	—	186	345	531
Unknown	395	293	886	870	1458	1280	31	27	59	22	6	9	37	12	9	4	2881	2517	5398
Total	55568	58361	56244	55165	24540	23513	1412	1540	2904	2347	2146	2147	1480	1447	255	213	144549	144733	289282

Source: The Third General Census of 1964.

TABLE 8

Percental Age Distribution of Each Ethnic Population on December 31, 1963

Age	Creole	Hindustani	Javanese	Indian	Chinese	European	Other	Unknown	Totals
0—4	18.6	21.8	17.4	16.1	12.8	14.0	17.6	77.9	19.5
5—9	16.1	17.3	13.0	16.1	12.7	12.8	13.6	7.4	15.9
10—14	12.4	13.2	9.8	13.9	11.5	8.9	11.2	2.5	12.2
15—19	9.2	9.9	6.9	11.0	8.9	4.5	7.4	1.9	9.0
20—24	6.2	7.6	6.3	7.9	7.8	4.1	6.1	0.6	6.8
25—29	5.6	6.4	6.8	7.7	7.8	7.1	5.7	1.2	6.2
30—34	5.2	5.3	6.9	6.5	7.4	10.9	7.7	1.4	5.7
35—39	4.8	4.4	4.6	5.5	6.1	7.5	6.7	0.2	4.7
40—44	4.2	3.3	2.9	3.6	4.9	7.9	4.6	0.6	3.7
45—49	3.6	2.8	1.5	2.7	3.8	5.6	3.7	—	3.0
50—54	3.2	1.8	4.1	1.9	3.7	4.9	4.0	0.6	2.8
55—59	2.8	1.4	2.9	1.4	3.3	3.7	2.2	—	2.3
60—64	2.2	1.0	3.1	1.2	2.7	2.5	2.3	0.4	1.9
65—69	1.5	0.5	4.3	0.8	1.6	1.5	1.9	1.0	1.6
70—74	1.3	0.4	1.6	0.3	1.2	1.4	1.4	0.2	1.0
75—79	0.9	0.3	0.8	0.4	0.8	0.8	0.5	0.4	0.6
80—84	0.5	0.0	0.3	0.1	0.3	0.4	0.5	0.2	0.3
85 and Older	0.3	0.0	0.1	0.1	0.1	0.3	0.4	—	0.1
Unknown	0.6	1.5	5.6	1.9	1.5	0.3	1.6	2.7	1.8
Totals	99.2	99.9	99.9	99.1	99.9	99.1	99.1	99.2	99.1

TABLE 9

Percental Distribution of Ethnicity at Each Age Level, December 31, 1963

Age	Creole	Hindustani	Javanese	Indian	Chinese	European	Other	Unknown	Totals
0—4	37.4	43.0	14.7	0.8	1.1	1.0	0.9	0.6	99.5
5—9	39.9	41.8	13.6	1.0	1.4	1.1	0.8	0.0	99.6
10—14	40.1	41.6	13.3	1.1	1.7	1.0	0.9	0.0	99.7
15—19	40.2	42.3	12.7	1.2	1.7	0.7	0.8	0.0	99.6
20—24	36.2	43.3	15.3	1.1	2.0	0.9	0.9	0.0	99.7
25—29	35.5	39.7	10.4	1.2	2.2	1.6	0.9	0.0	99.5
30—34	36.1	35.9	20.1	1.1	2.3	2.8	1.3	0.0	99.6
35—39	40.4	36.0	16.1	1.1	2.3	2.3	1.4	0.0	99.6
40—44	44.2	34.7	13.1	0.9	2.4	3.1	1.2	0.0	99.6
45—49	47.2	36.7	8.6	0.9	2.3	2.8	1.2	—	99.7
50—54	43.8	25.1	23.9	0.6	2.3	2.5	1.4	0.0	99.6
55—59	47.8	24.1	21.3	0.6	2.6	2.3	0.9	—	99.6
60—64	45.6	20.3	27.4	0.6	2.5	1.9	1.2	0.0	99.5
65—69	37.6	13.3	44.0	0.5	1.8	1.3	1.2	0.1	99.8
70—74	51.2	17.3	25.5	0.3	2.1	2.0	1.3	0.0	99.7
75—79	56.3	18.7	19.2	0.6	2.1	1.7	0.7	0.0	99.3
80—84	63.1	10.9	19.5	0.3	2.1	2.1	1.5	0.1	99.6
85 and Older	65.1	10.5	16.7	0.9	1.5	2.6	2.4	—	99.7
Unknown	12.7	32.5	50.7	1.0	1.5	0.2	0.9	0.2	99.7
Totals	39.3	38.5	16.6	1.0	1.8	1.4	1.0	0.1	99.7

TABLE 10

Distribution of the Labor Force by Economic Sector and by Sex, on March 31, 1964

Economic Sector	In Absolute Numbers			In Percentage of Total		
	Male	Female	Total	Male	Female	Total
Agriculture and Forestry	15,374	14,548	19,922	25.1	23.9	24.9
Mining	5,413	184	5,597	8.9	1.0	6.9
Industry	6,835	1,198	8,033	11.2	6.3	10.0
Construction	2,222	30	2,252	3.6	0.1	2.8
Business and Transportation	8,264	2,555	10,819	13.5	13.5	13.5
Service	1,766	3,621	5,387	2.9	19.0	6.7
Government	13,295	4,491	17,786	21.7	23.6	22.2
Unclassified	2,107	343	2,450	3.4	2.0	3.1
Subtotals	55,276	16,970	72,246			
Unemployed	5,933	2,011	7,944	9.4	10.6	9.9
Totals	61,209	18,981	80,190	100.0	100.0	100.0

Source: The Third General Census of 1964.

TABLE 11

Gross National Product by Type of Economic Activity

	1965	1964
Agriculture	28.8	24.3
Forestry	6.0	5.6
Mining	71.5	64.1
Industry	36.3	28.6
Trade	38.9	31.5
Transportation	10.5	8.9
Services	19.6	18.7
Government	47.0	43.5
Building Trades	11.4	10.7
Gross Domestic Product at Factor Cost (In Millions of Surinam Guilders)	270.0	235.9
Net Factor Income from Abroad	— 28.5	— 29.1
Gross National Product at Factor Cost (In Millions of Surinam Guilders)	241.5	206.8
Cost of Living Price Index (1955 = 100)	128.2	125.2
Gross National Product at Factor Cost (In Millions of 1955 S. Guilders)	188.4	165.2
Population Size (× 1000, Including Bush Negroes and Indians)	347.3	333.9
Gross per Capita Income at 1955 Prices (In Millions of Surinam Guilders)	542	495

After the 1965 Yearly Report of the Planning Commission.

CHAPTER II

THE DEVELOPMENT OF FERTILITY

§ 2.1. THE DEVELOPMENT OF FERTILITY BETWEEN 1922 AND 1970

This section concerns the development of fertility from the years 1922 to 1970. The subsections trace the relationship between this component of population growth and several variables. § 2.2 treats differential fertility and ethnicity, and § 2.3 determines the effect (in percentages) on the general fertility rates of a number of interacting variables such as population density, industrialization, ethnic origin, religion, and education. An attempt is made to identify the factor with the dominant effect upon natality.

Because of the large number of children born out of wedlock — estimated at over 50 % of all births — it is not possible to use the marital fertility index as a guide to the level of fertility. This is also true for the fertility rate, which cannot be used because the data on mother's age was unavailable, especially in the period before 1950. In their place will be used the crude birth rate (the number of births per year per 1000 inhabitants), although admittedly this is a less exact indication of fertility. The birth rate will be analyzed for each of the three major ethnic populations.

The computations of the fertility rates for the 1921-1950 period were based on the data of the 1950 census. As justified by the extensive discussion in § 1.4.4, it is assumed that the results of the Second Census are reliable, and that those of the First (1921) Census were too high. New population figures were computed for the period 1921-1950. These are reproduced in Table 58. The size of the population between 1950 and 1963 is based on 1950 census results and self-collected vital statistics. Migration has been ignored for this period, for the reasons outlined in § 1.4.3. This section endeavored to show that the balance of settlement over out-migration was too small to affect population size to a significant extent. It therefore remains justified to compare the birth data and, eventually, the fertility figures of this period with those of the periods

1922-1950 and 1964-1970, when migration *did* affect the population composition.

For the population figures between 1964 and 1970, not only the 1964 census but the mortality data of the Ministry of Health and self-collected birth and migration figures were employed.

Three phases can be distinguished in the development of fertility in the fifty years since 1923. The first phase is one in which the birth rate remained virtually unchanged. That was during the period from 1923 to 1943. It was followed by the second phase, lasting from 1943 until 1962, when reproduction increased. The final phase is one of decline. The birth rate, which oscillated at 36 per thousand in phase one, rose to a level of 48 per thousand in 1962, and went down to 36.5 in 1970.

The evolution of the birth rate is also distinguished by fluctuations in the 1923-1943 period. In fact, however, these are less important than they appear, amounting as they do to at most 7 points for the differences between 1924 (39.4 per thousand) and 1927 (32.4). Furthermore, when the birth rate is expressed in percentages, we note that the difference amounts to but 0.5 %, a negligible quantity. This is not to deny, of course, that the yearly waves of immigration, which were very unequal in the pre-1940 period, may have contributed to the development of peaks in the graph of the birth rate. The fact that much stronger fluctuations exist among the Hindustani and the Javanese (both comparatively recent immigrants) than among the Creoles, makes such an interpretation attractive.

Countries having a somewhat similar socio-economic structure to Surinam, such as Trinidad (a Caribbean island close to the North coast of Venezuela) and Guyana (Surinam's Western neighbor), demonstrate an analogous, three-phased trend in the development of fertility. This is shown for Guyana by the figures published in the *Demographic Yearbook,* and for Trinidad by the *Central Statistical Office* (1956; 1969). Differences between the statistics in the *Demographic Yearbook* and other publications on Guyana (Harewood 1967a: 86; 1968: 878-881) are minor. The *Yearbook* was retained as the primary source because it gives statistics for the complete period 1923-1968. In Guyana, the birth rate remained quite stable between 1923 and 1944, then rose to 43 per thousand in 1959, and since 1962 shows a decline.

In Trinidad (see also Harewood 1967a: 86; 1967b: 219; 1968: 878-881) and some other Caribbean islands, the three-phased fertility trend is also encountered. The rise in reproduction began in 1942, its fall in 1961.

TABLE 12

Numbers of Live Births in Surinam, and Comparison of Ratios per 1000 Inhabitants for Surinam, Guyana, and Trinidad

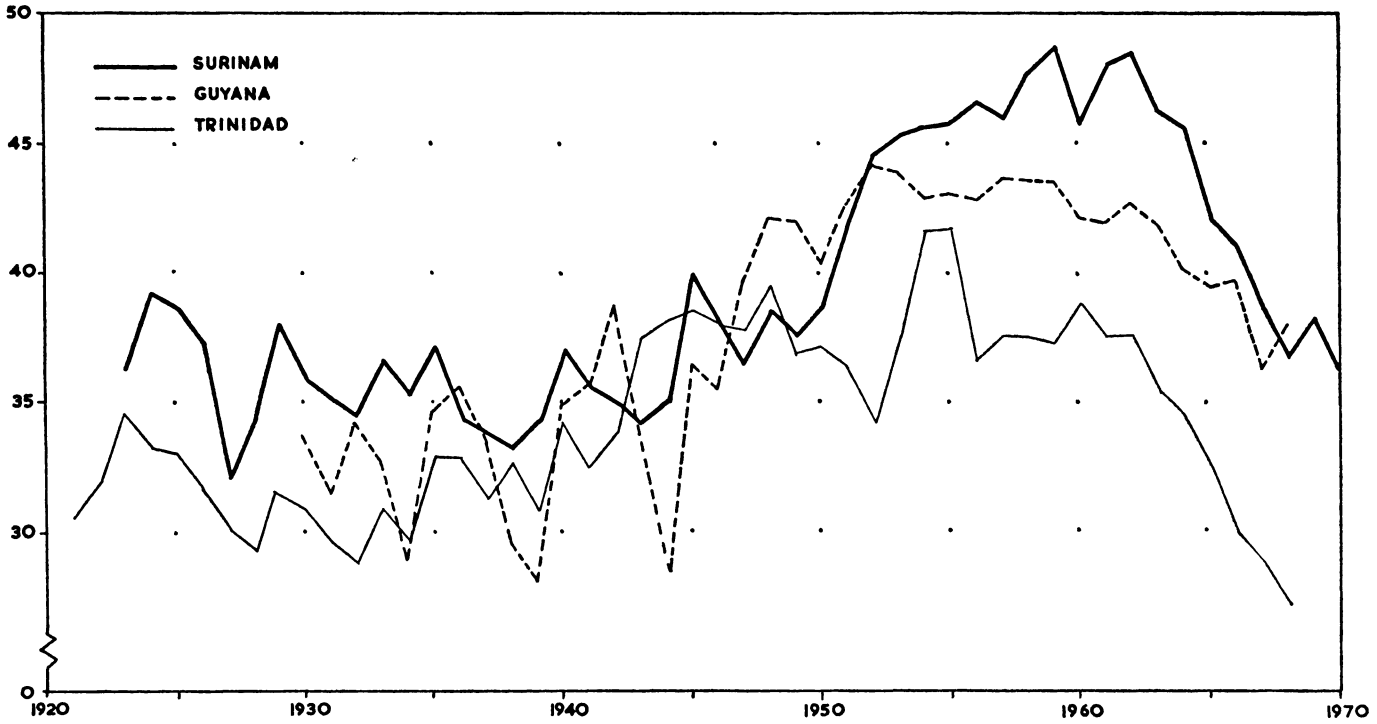
Year	Surinam [1]		Guyana [2]	Trinidad [3]
	Numbers	Ratios	Ratios	Ratios
1923	3464	36.5	31.4	34.7
1924	3846	39.4		33.6
1925	3931	38.9		33.1
1926	3922	37.6		31.9
1927	3481	32.4		30.4
1928	3825	34.6		29.5
1929	4331	38.2	32.4	31.7
1930	4159	36.0	33.8	31.1
1931	4166	35.3	31.6	29.8
1932	4186	34.8	34.3	28.9
1933	4532	36.8	32.8	31.0
1934	4474	35.5	28.9	29.7
1935	4806	37.4	34.7	32.9
1936	4536	34.6	35.6	32.9
1937	4524	34.0	33.6	31.4
1938	4514	33.5	29.7	32.8
1939	4740	34.5	28.3	30.9
1940	5224	37.1	35.0	34.5
1941	5140	35.8	35.8	32.6
1942	5159	35.2	38.8	34.0
1943	5145	34.4	33.6	37.7
1944	5346	35.2	28.8	38.4
1945	6213	40.1	36.6	38.7
1946	6098	38.4	35.6	38.3

Year	Surinam [1] Numbers	Surinam [1] Ratios	Guyana [2] Ratios	Trinidad [3] Ratios
1947	5983	36.7	39.9	38.1
1948	6476	38.8	42.3	39.7
1949	6473	37.8	42.3	37.1
1950	6863	39.0	40.4	37.3
1951	7652	42.2	42.5	36.7
1952	8361	44.7	44.3	34.6
1953	8790	45.4	44.1	37.8
1954	9196	45.8	42.9	41.9
1955	9547	45.9	43.2	41.9
1956	10106	46.8	43.1	36.9
1957	10375	46.3	43.8	37.7
1958	11180	48.0	43.8	37.6
1959	11879	49.0	43.7	37.4
1960	11617	46.1	42.2	39.1
1961	12657	48.3	42.1	37.9
1962	13287	48.7	42.7	37.9
1963	13186	46.5	42.0	35.6
1964	13549	45.9	40.3	34.7
1965	12925	42.3	39.7	32.8
1966	13045	41.3	39.8	30.2
1967	12746	39.1	36.5	28.9
1968	12414	37.1	38.1	27.5
1969	13114	38.4		
1970	12710	36.5		
1971 *	13754	39.0		

[1] 1922-1949 figures based on 1950 Census.
[2] After 1945, excludes American Indians.
[3] Before 1954 Year of Registration.
* 1971 figures are provisional.

Figure I

LIVE BIRTHS PER 1000 INHABITANTS: SURINAM, GUYANA TRINIDAD, 1923-1970



This trend is not unique to these countries. A similar development took place in Western Europe and England, according to Stycos (1968: 28) who wrote: "First of all, we must not overlook the possibility that Latin-America birth rates will rise before they begin to fall. This occurred in England and most Western-European nations" (see also Biraben 1966: 1-29).

The following subsections deal with the degree to which the development of the birth rate parallels that of public health, nutritional status, age of the mother at the birth of her first child, and age distribution. For some of these factors insufficient data are available, especially for the period before 1940. Therefore the analysis of fertility data for the period before the Second World War is somewhat summary.

§ 2.1.1. PUBLIC HEALTH

It is probable that the development of the birth rate relates to changes over the years in the general conditions of health for the Surinam population. This is especially so in regard to certain parasitic and communicable diseases, such as malaria and venereal disease.

The original intent was to trace the relative contributions to the fertility index of a number of specific diseases. Unfortunately this proved to be impossible because of the lack of statistics prerequisite to any attempt to quantify the relationship between a particular disease and the birth rate. Instead, the present study investigates the degree to which measures to improve public health have actually influenced the number of births. Thus, the emphasis here is not on the influence of different diseases, but upon the accumulative effect of the measures to combat these causes of death.

A. *The 1922-1943 period*

The birth rate for this era in Surinam averaged a constant 36 per thousand. Some investigators even speak of a minor decline. Insofar as they may be correct, however, this "lowering" was practically infinitesimal. Since the focus of this research is on the post-1950 period, and since there are almost no particulars for the time before 1950, it is not possible here to decide whether there is a relationship between the fact of the relatively low birth levels in the period 1920-1943 and the fact that there were few measures to improve public health in the pre-1940 days. Perhaps such conclusions could be based on the data for the period after 1943.

B. *The 1943-1962 period*

It is highly probable that the increase in the birth rate between 1943 and 1962 is in part a function of the amelioration of public health in the period just before and after 1943. This supposition rests upon the fact that certain diseases, such as malaria and venereal disease, generally have a braking effect upon the birth rate. As Pampana observes:

> Malaria may lead to interruption of pregnancy, to miscarriages and abortions, which may be in part explained by the various types of anaemia that it causes, and in part by the well-known predilection of malaria parasites and particularly of P. falciparum for the placenta. Hence it would be logical to assume that malaria may, to some extent, reduce the number of live births. Available data on the influence of malaria on natality rates are, however, contradictory (Pampana 1954: 501).

In Surinam, malaria probably has had no influence on the birth levels of the population living in the coastal zone, because there the climatological circumstances do not favor the malaria mosquito. In Guyana, on the other hand, malaria has had a measurable impact on birth and death, because there the coastal areas were more amenable to mosquitoes than in Surinam (Giglioli 1948: 39, 65). The water reservoirs, in the form of irrigation canals dug for the cultivation of sugar cane and rice, make fine breeding places for the mosquito in the coastal plains of Guyana, while the cane growing there gives protection from the wind. The decline of the birth rate in Guyana is followed by an increase after 1940, which, according to Giglioli and other investigators (Harewood 1968: 878, 879; Roberts 1957: 282) is related to the control of malaria. Newman notes that Smith saw no relationship between Guyanan birth rates and malaria, but offers no data to bolster this conclusion (Newman 1970: 151-158).

Although Surinam, unlike Guyana, does not demonstrate a clear link between malaria and fertility, it may nevertheless be assumed that the various measures to control this and other diseases effected a positive influence on the birth rate. Besides malaria, these measures include the efforts to combat Aëdes Egypti (yellow fever), and the purification of the water supply through the distribution of piped water. The use of rain water and well water was prohibited in Paramaribo and some other Districts. Some years later, in 1948, a start was made in the program to spray with D.D.T. all dwellings and containers which might serve as breeding places for the mosquito responsible for yellow fever.

For the same reasons, the keeping of private ponds was forbidden. Although these tactics (van der Kuyp 1967: 7) which in combination with the anti-malaria measures amounted to 1.5 million Surinam guilders, did not yet succeed in eliminating the two diseases, some clear gains have been noted. Yellow fever has been eliminated from the coastal regions for decades. There, the control measures have definitely a preventive character. However, the disease is still encountered in the interior.

Another disease whose control has occupied interests for a number of years is bilharzia. Unlike yellow fever, it is still found in the coastal strip, especially in the shell-mound regions. Various measures have been taken to battle this illness. Persons who contract the disease are treated with Miracyl D. Prevention is difficult because bilharzia is related to the activities of the agricultural population. Hindustani and Javanese are over-represented in agriculture. Their work regularly exposes them to the water-covered rice fields which are the breeding places for bilharzia. Then too, the farmers are generally barefoot, which increases the chance for infection. For these reasons also, the effort to treat patients is supplemented by medical education such as the showing of films which demonstrate the manner in which infection takes place, and advice in the building of sanitary facilities.

Other health measures were important to the promotion of public health in the 'Forties and 'Fifties. Consultation offices for pregnant women and infants have been opened. These are being visited by increasing numbers of people (van der Kuyp 1956).

In short, it may be assumed that the strides made in the 1940's in preventive and curative medicine had a positive influence on fertility. Their combined results contributed to the rise in the birth rate between 1943 and 1962. It follows that the "low" birth rates in the Twenties and 'Thirties resulted in part from the fact that public health efforts were less intensive in the pre-1943 period.

Gonorrhea is another disease which is suspected of affecting reproduction. Stone notes:

Of special importance in relation to fertility are the venereal diseases, gonorrhea and syphilis. Gonorrheal infection may lead to inflammation of the epididymus in the male or of the fallopian tubes in the female, causing obstruction to the passage of sperm and egg-cells. Syphilis may be the cause of fetal deaths resulting in miscarriage or stillbirth. Formerly these diseases were a frequent cause of infertility, but the advent of modern methods of treatment are markedly reducing their

threat to reproduction (Stone 1954: 737; see also Nag 1962: 123, 124).

That gonorrhea is one of the factors in infertility is also shown in the work of Romaniuk (1968: 219-221), who notes that the Congo (now Zaïre) districts where the disease is frequent have lower birth rates than the areas in which its spread is more limited.

There are few differentiated data on the incidence of venereal diseases in Surinam. It has not been possible, therefore, to measure the extent to which the importance of gonorrhea has declined, nor how such changes affected the rise in the birth rate between 1943 and 1962. It is not improbable that the high turnover of sexual partners, especially in the lower income groups, encourages the spread of venereal diseases, and so affects the birth levels. This possibility will be further investigated in the section on family structure.

C. *The post-1962 period*

The birth rate began to decline in 1962 after a rising phase which lasted two decades. This decline does not contradict the fact that after 1962 there were still measures to improve public health. It is possible that the positive influence of such factors was canceled out by the negative influences of a number of other variables. These will be discussed later.

§ 2.1.2. NUTRITIONAL STATUS

The relationship between diet and fertility has been explicitly stated by Stone:

> A diet lacking in vitamins A or B or E, for instance, or in such amino acids as arginine, tryptophane or lysine, may lead to a loss of fertility by either suppressing sperm formation or ovarian function, or by interfering with fertilization or implantation. It has also been reported that diets deficient in vitamin E or in folic acid, and that even the administration of a drug which is antagonistic to the utilization of folic acid may cause a resorption of the fetus after pregnancy has already started. In the main, then, the more adequate a diet is in its protein, vitamin and mineral content, the more efficient will be the reproductive mechanism (Stone 1954: 734).

Nag (1962: 128; 1972: 234) has been less positive about the link between the two phenomena.

A. *The 1922-1943 period*

For nutrition as well as for public health, the data are inadequate to allow an interpretation of the role of this factor in the birth levels. However, the 1943-1962 data may reflect the negative influence of diet in the 1922-1943 period on the relatively low birth rate for those years.

B. *The 1943-1962 period*

Around 1930, the State began a program of supplying food to school children. Nutrition research was conducted among school children, which lead to the conclusion that their nutritional status was adequate (van der Kuyp 1956: 4). Unfortunately his research report did not explain the degree to which the size and the composition of the subject population was representative of the school-age youth of Surinam.

Some twenty years later, in 1952, a budget research program was completed. This noted an improvement in the menu composition of the population, as compared with the previous period. Probably this improvement reflects the general advance in the economic situation which was achieved largely during and after the Second World War. "Because of better economic conditions following the war, the diet generally is more adequate" (van der Kuyp 1963: 230). The study does not mention whether the menu improvement is based on a comparison with the earlier study on the diet of school children, and if so, how far the results of the comparison apply to the population in general.

Between 1958 and 1968, the Central Institute for Nutrition and Food Research made a thorough investigation into medico-physiological factors. A comparison of its results with those of the 1952 menu study — acknowledging that the studies are not completely comparable — leads to the following conclusions. Since the earlier study found few shortages in proteins and calcium (van der Kuyp 1963: 207, 211, 214, 218, 219, 230), the latter research failed to note an improvement in the nutritional status between 1952 and 1968. It was noted again that the intake of albumen and calcium was low when compared to Western Europe, but actual anemia and clear albumen deficiencies were not encountered. The absolute need for calcium appeared to be lower than among typical Western Europeans.

In order to further ascertain the albumen provision, the activities of the blood serum enzymes amylase and lypase were determined. These also did not allow the conclusion that an albumen shortage existed (van der Kuyp 1963: 288). (Original in Dutch.)

Regarding calcium, the report states:

> From these results it may be concluded that the need for calcium is lower in Surinam than in Western Europe or North America, a finding which accords with the views of the Food and Agriculture organization, and of the World Health Organization. It follows that the promotion of products rich in calcium, such as milk and milk products, for human consumption is of little urgency in Surinam (van der Kuyp 1963: 288). (Original in Dutch.)

In view of the foregoing, it would appear that the nutritional status in Surinam in the pre-1943 period was not so bad that the improvement which began in that year can account for the rise in the birth rate. In fact, a number of other measures regarding nutrition had been taken. In 1930, a food inspection service was begun: persons who worked in food stores, butcher shops, etc., were required to undergo yearly medical examinations. The inspection of meat before and after butchering became mandatory. Years later, in 1954, with the help of UNICEF, the distribution of milk to pregnant women, infants, and school children was instituted.

It is probable that these measures, coupled with other improvements in the public health, had a positive effect upon the birth rate in the 1940's and '50's. One may conclude that the "low" figures for the birth rates in the years between 1923 and 1943 were related to the absence of most of the measures mentioned above.

For many other South American countries the rising birth rate after World War Two is partly explained on the basis of improved diet (Stycos 1968: 28, ff). This applies to Jamaica (Tekse 1968: 7-10) and to Trinidad (Roberts 1971: 696).

C. *The post-1962 period*

The fact that the birth rate declined after 1962 implies that any further positive influence of better nutrition was submerged in the effect of factors which reduced the birth levels. These factors will be examined later.

§ 2.1.3. MOTHER'S AGE AT BIRTH OF FIRST CHILD

It is generally true that an early age at marriage has a positive influence on fertility, although this trend is partly compensated for by other factors (Davis and Blake 1956: 4-8). As noted earlier, marriage is not the only

form of cohabitation for a large proportion of the Surinam population. As there are no yearly data on the age at which family union (marriage, common-law, or visiting union) takes place, this factor will not be investigated in the explanation of the development of fertility. An attempt will be made, however, to discover the role of ethnicity in age at entry into a particular type.

This section is concerned with the question whether the age of the mother at the birth of her first child is a factor influencing fertility rates. Here, too, it must be noted that a positive relationship has only general relevance. Again there exist other factors whose activity generates a negative influence. The presence or absence of voluntary birth control is a case in point, one which usually results in lengthy intervals between the first and second births. Nevertheless, the age of the mother at her first reproduction generally is positively correlated with fertility, just as early marriages have a positive influence, as Davis and Blake (1956) noted.

A. *The 1922-1943 period*

There is no information recorded on the age of the mother at the birth of her first child. Although the First General Population Census was held in 1921, questions on this subject were not asked until the 1950 census.

B. *The 1943-1962 period*

Some data are available for this period, consisting of the results of the 1950 census. On the basis of these, Gemmink (1966: 86, 87, 143-145) devised a table which is reproduced here in a modified form.

Table 13 (which contains only figures for Creoles and Hindustani since the necessary information was lacking for other groups) shows that 55 % of women aged 20-24 gave birth to their first child before their 20th birthday; for women in the higher age brackets the percentages are lower. The implication is that for both groups in general the age of women at the birth of their first child has declined in the period before 1950. This decline was quite gradual: the figures are 55 % for the 20-24 age group and 41 % for the 45-49 age category. It cannot be simply concluded, however, that the decline in the age of the mother at the birth of her first child necessarily contributed to the rise in the fertility rate in the pre-1950 period, because there are no data on the influence of birth intervals. As noted earlier, the effect of even a dramatic decline in mothers' ages may be nullified by an increase in

TABLE 13

Numbers of Mothers who have their First Child Before Age 20, per 1000 Women in Different Age Groups, in 1950

Mothers' Year of Birth	Mothers' Age in 1950	Number of Mothers per 1000 Women in Each Age Group		
		Creole	Hindustani	Combined
—1936	Under 15	(—) *	(—) *	(—) *
1931—1935	15—19	(—) *	(—) *	(—) *
1926—1930	20—24	305	705	550
1921—1925	25—29	266	725	496 **
1916—1920	30—34	231	739	485
1911—1915	35—39	206	746	476
1906—1910	40—44	200	719	460 **
1901—1905	45—49	189	635	412
Total		204	541	

* Incomplete life phase: Since the data on the age groups below 15 and 15-19 are not complete, the numbers for these age categories have been omitted.
** Figures rounded off.

the interval between successive births, or by a decrease of the average age of the mother at the birth of her last child. Table 13 also indicates that reproduction begins at a much earlier age among Hindustani than among Creole women. This difference holds true for all birth cohorts. No such data are available for the Javanese population.

The raw data for Table 13 came from the marriage certificates of the respondents in the 1950 census. This minimizes the possibility that older women may have forgotten to report the births of their deceased children. This is an important consideration in view of the fact that the non-use of the certificates (small booklets recording various vital events related to the marriage) may result in "under-registration" of the number of dead children. This would produce the same trend as Table 13 documents: the number of mothers who were aged less than 20 at the birth of their first child would be smaller for older than for younger women. In such a case, the conclusion that first child mothers are younger than in the past would be incorrect.

C. *The post-1962 period*

As Table 14 and Figure 2 indicate, the average age of mothers at the birth of the first child rose from 20.9 years in 1966 to 21.1 in 1970. This increase is especially important for the Javanese population. The emancipation of Javanese women, their desire for more education, and the decline in the tradition of child-marriage all combined to raise the age of marriage. But even for this group, the rise in the age at which procreation begins is too small to account for the lowering of the birth rate after 1962.

TABLE 14

Average Age of Mother at Birth of First Child, by Ethnic Group

Year	Creole	Hindustani	Javanese	Total
1966	21.8	20.1	18.8	20.9
1967	21.9	20.5	19.5	21.1
1968	21.8	20.3	19.3	21.1
1969	21.5	20.3	19.5	20.9
1970	21.8	20.7	19.8	21.1

The same tendency to change the reproductive patterns is repeated in Table 15 and Figure 3, which clearly demonstrate that the percentage of women who have their first child between the ages of 15 and 19 has declined. In 1966, this fertility cohort accounted for 47.1 % of first births, in 1970 for only 42.3 %. Again, however, this change has not been of major importance: only among the Javanese and the Hindustani is there a clear indication of a declining tendency.

For the post-1962 period it is thus also true that both the rise in age at procreation and the decline of the percentage of young first-mothers are unable to account for the general decline in the birth rate. Furthermore, nothing is known about the birth intervals and the age at the birth of the last child for this period.

§ 2.1.4. AGE DISTRIBUTION

Because changes in the age structure of the population may be related to the development of the fertility levels, changes in the age distribution, especially in regard to the percentages of females aged 15-44, will be investigated.

Figure 2

AVERAGE AGE OF MOTHERS AT BIRTH OF FIRST CHILD.

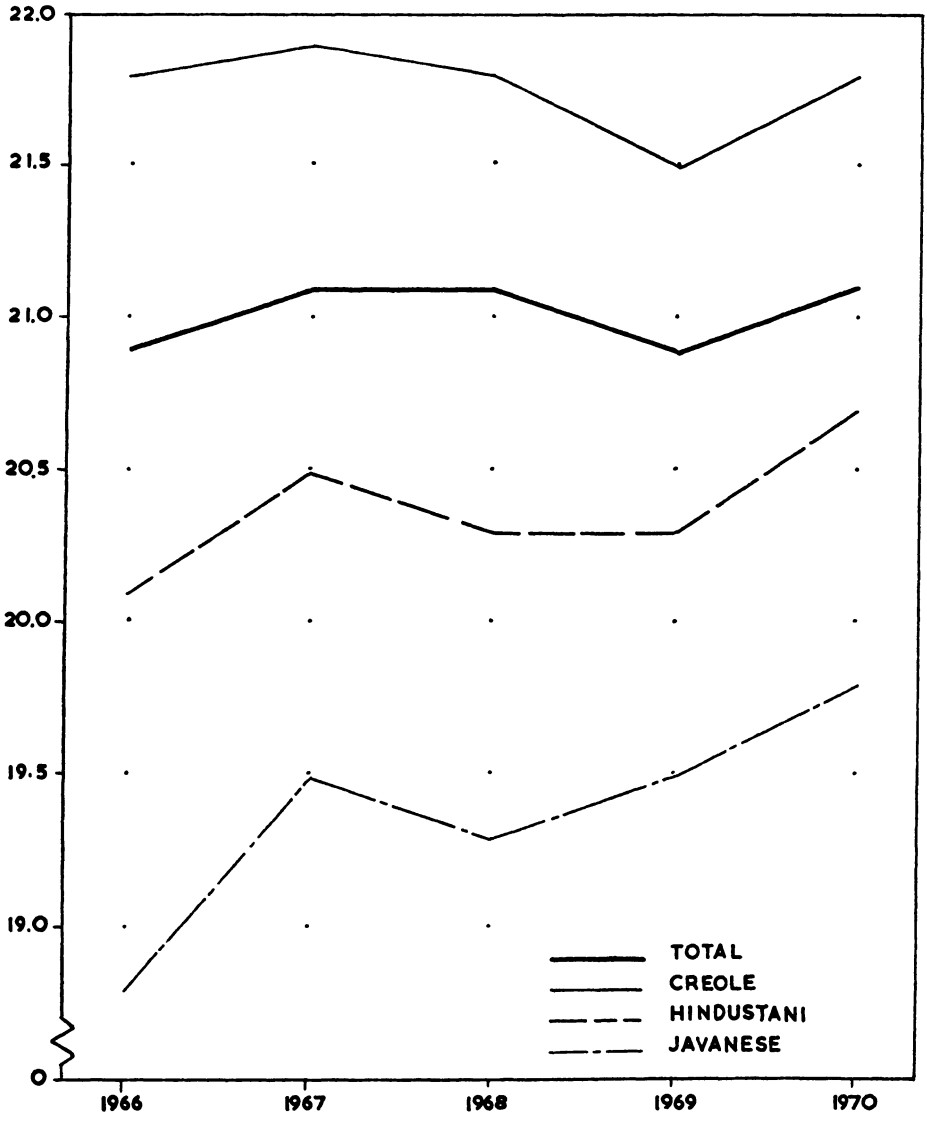


TABLE 15

Percentage of Women who have their First Child Between the Ages of 15-19, by Ethnic Group

Year	Creole	Hindustani	Javanese	Total
1966	37.8	56.9	64.6	47.1
1967	39.2	48.0	58.9	42.2
1968	36.9	51.6	61.8	42.6
1969	40.0	50.5	53.3	41.1
1970	34.5	46.8	58.0	42.3

A. *The 1922-1943 period*

There are no data on the age distribution of Surinam's population for this period, and no ratios can be computed.

B. *The 1943-1962 period*

Table 16 shows that women aged 15-44 declined during this period from 20.6 % to 18.8 % of the total population. At the same time, however, the birth rate rose 11 points. It is thus safe to conclude that other factors also played a positive role in the fertility picture.

One possible factor is the development of the most-fertile age category. As Table 17 indicates, for Surinam this is the category aged 20-29. Data on age-specific fertility rates are available only for the 1950 census and for the post-1962 period. For the year 1950 itself, there is no information. Table 17 makes clear, however, that the percentage of women aged 20-29 did not increase between 1950 and 1962. Thus, this factor is no more important than the percentage of women aged 15-44 in causing the changing fertility level. In fact, even if we did not know which age category was the most fertile, we would arrive at the same conclusion: all the quinary classes for women aged 15-44 remained fairly constant for this period.

Since only the non-standardized birth figures have been compared, it is not possible to deny that the factor of age distribution had an influence on population development. If we take the population of 1950 as a standard, we note that the number of women aged 15-44 was 36,802 in 1950, and 52,440 in 1962. On the basis of the relationship between births and the size of this fertile cohort for the year 1950,

Figure 3

PERCENTAGE OF FIRST-CHILD MOTHERS BETWEEN 15 AND 19 YEARS OF AGE

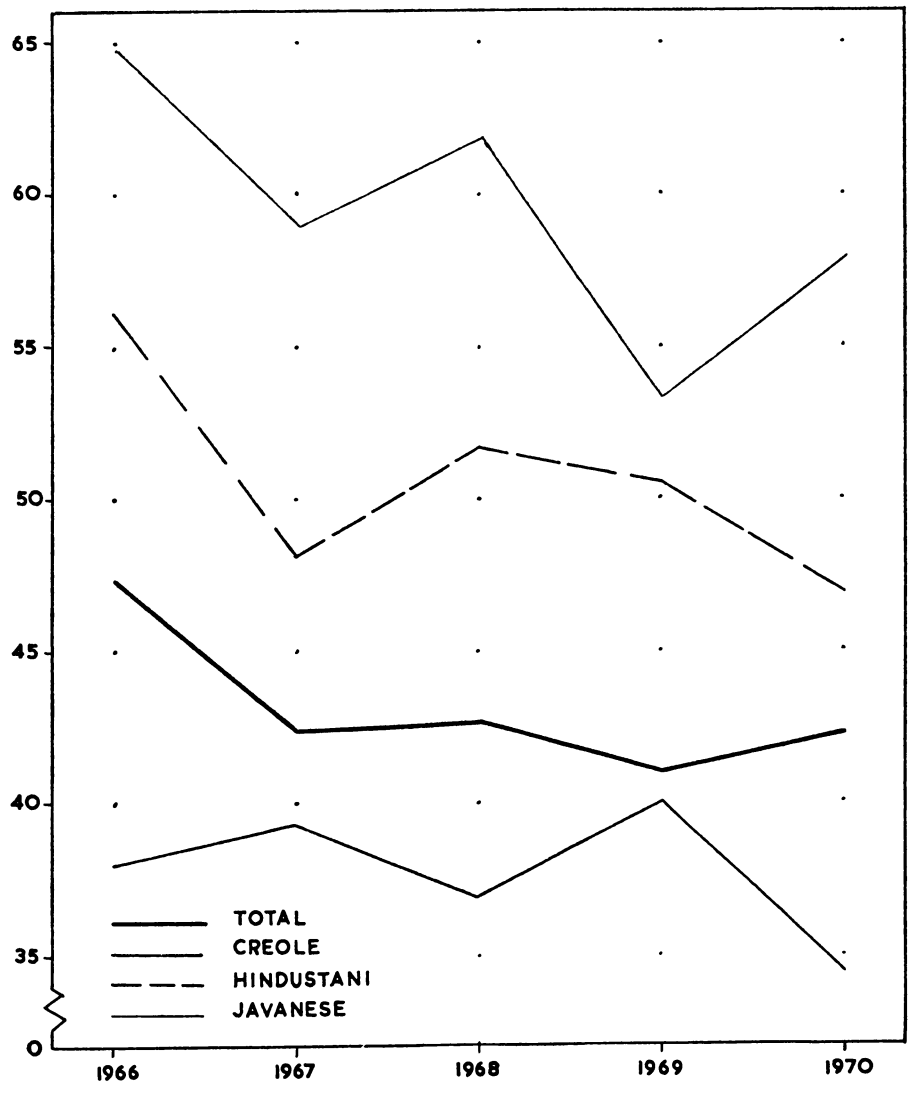


TABLE 16

Women Aged 15-44, in Absolute Numbers and in Percentages of the Population, 1950-1970

Dec. 31 of year	Live births per 1000 inhabitants	Women aged 15-44	
		Absolutes	Percentages
1950	39.0	36,802	20.6
1951	42.2	37,773	20.5
1952	44.7	38,766	20.3
1953	45.4	39,775	20.2
1954	45.8	40,762	19.9
1955	45.9	42,100	19.8
1956	46.8	43,241	19.6
1957	46.3	44,482	19.5
1958	48.0	45,871	19.3
1959	49.0	47,419	19.1
1960	46.1	49,026	19.1
1961	48.3	50,963	18.9
1962	48.7	52,440	18.8
1963	46.5	53,428	18.4
1964	45.9	55,295	18.4
1965	42.3	57,136	18.3
1966	41.3	58,756	18.3
1967	39.1	61,204	18.5
1968	37.1	63,121	18.6
1969	38.4	64,564	18.7
1970	36.5	65,728	18.7

the number of births in 1962 should have been 9,779, the result of $\frac{52,440}{36,802} \times 6863$. This is lower than the actual registration of 13,287 births, which indicates that the actual number of births must also have been lower. Only on this basis may it be concluded that the rise in the birth rate between 1950 and 1962 followed from increased fertility, and not from changes in the age-structure of the population.

C. *The post-1962 period*

In this period as in the previous one, the percentage of women aged 15-44 did not decline. This factor thus cannot be invoked to account

TABLE 17

Women Aged 15-44 in Quinary Groups, in Percentages of the Total Population of Women aged 15 to 44

Year	15-19	20-24	25-29	30-34	35-39	40-44	15-44 (Total)
1950	24.7	20.1	17.6	13.6	12.0	11.8	99.8
1951	24.7	20.6	17.3	13.8	11.7	11.5	99.6
1952	24.6	21.1	17.3	13.9	11.6	11.1	99.6
1953	24.4	21.0	17.4	14.8	11.3	10.9	99.8
1954	24.2	21.5	17.3	15.1	11.3	10.4	99.8
1955	24.1	21.4	17.3	15.1	11.6	10.2	99.7
1956	23.9	21.4	17.8	14.9	11.8	10.0	99.8
1957	23.8	21.2	18.1	14.9	11.9	9.9	99.8
1958	23.9	20.9	18.0	14.8	12.5	9.6	99.7
1959	24.1	20.6	18.2	14.6	12.7	9.5	99.7
1960	24.0	20.5	18.1	14.6	12.7	9.7	99.6
1961	24.3	20.2	18.0	14.9	12.5	9.9	99.8
1962	24.5	20.0	17.8	15.2	12.4	9.8	99.7
1963	24.4	19.0	17.3	16.0	12.9	10.1	99.7
1964	24.8	18.9	17.0	15.6	12.9	10.6	99.8
1965	24.8	19.0	16.5	15.6	12.8	11.0	99.7
1966	25.1	19.2	16.2	15.3	12.9	11.0	99.7
1967	26.2	19.0	15.8	15.0	13.1	10.7	99.8
1968	26.7	19.3	15.4	14.4	13.3	10.7	99.8
1969	27.5	19.2	15.2	14.1	12.9	10.7	99.6
1970	28.3	18.9	15.0	13.8	13.1	10.7	99.8

for the decline in the birth rate after 1962. Although the percentage of the most fertile age group (20-29) in the population did decline somewhat, this was not a major change, and was probably related to the greatly increased emigration of the 1960's. This possibility will be investigated later.

It is apparent that neither the rise nor the fall in the birth rate between 1943 and the present can be explained on the basis of the population's age structure. Only in the post-1962 period is a slight decline noted for the most-fertile group. It may thus be concluded that the changes in the birth rate reflect actual changes in fertility. Although crude birth rates are useful for some purposes, a finer instrument of measure is needed. Therefore the birth levels will be computed in terms of age-specific fertility rates. Unfortunately, it was only possible to calculate these ratios for the period after 1962.

It must be emphasized here that the figures on fertility for the 1951-1963 period (as they are given in Table 18) are *not* comparable to those of the post-1963 period. During the former period there was no effort to collect data on the age of the mother at every birth. It was therefore impossibe to eliminate the category of births occurring to mothers below age 15 and over age 44. The figures are given only to indicate the degree to which the fertility rates changed between 1950 and 1962. The error introduced by the number of births occurring outside of age group 15-44 is, in any case, minor. This is indicated by the numbers of births to mothers below age 15 and over age 44 for the randomly selected year of 1966: the total was 88, that is to say, 0.6 % of the total number of births for that year.

Figure 4

AVERAGE PARITY

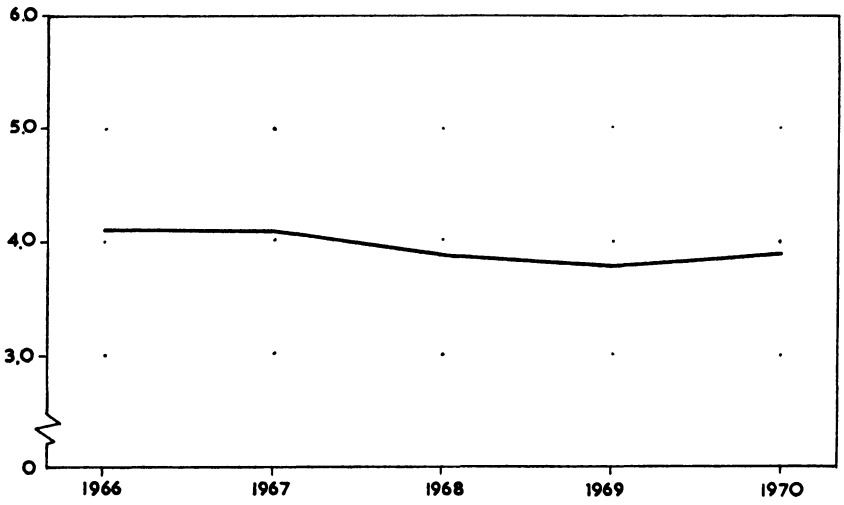
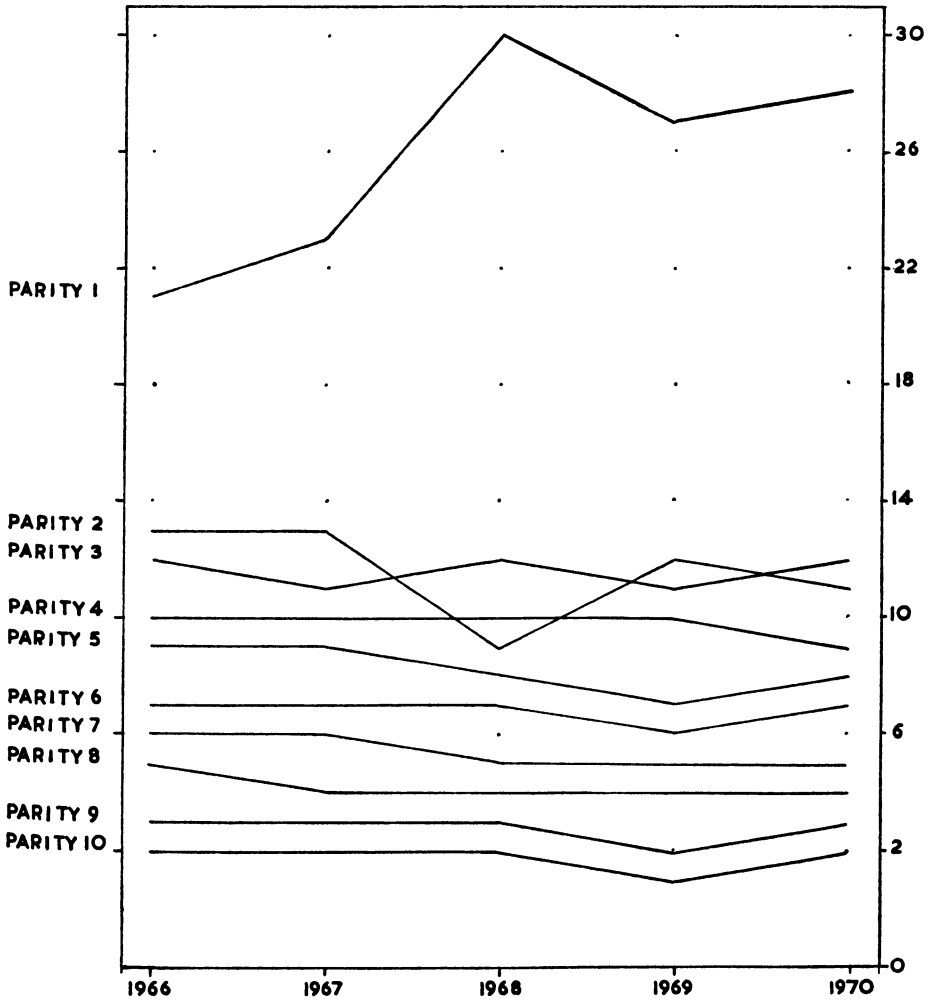


Figure 5

PERCENTAGES OF MOTHERS BY PARITY



That fertility has declined since 1962 is also indicated by the changes in parity. Figure 4 shows that the average family size declined between 1966 and 1970 from 4.1 to 3.9 children. Figure 5 demonstrates that the percentage of mothers with large families has shrunk, while that of women with small families has expanded.

The fertility rate fell from 234.2 per 1000 in 1964 to 185.1 in 1970. This decline was noted among all age cohorts, although not in equal degree, as Tables 18 and 19 indicate.

It is also clear that the birth rate for the age group 15-19 declined the greatest percentage, and that for the group 40-44 the least. Although the percentage decline of age group 20-24 was not great when compared to the other cohorts (see Table 19), this group and that aged 15-19

TABLE 18

Live Births per 1000 Women Aged 15-44, by Quinary Age Groups

Year	15-19	20-24	25-29	30-34	35-39	40-44	15-44 *
1951							205.2
1952							218.4
1953							223.8
1954							228.3
1955							230.4
1956							236.8
1957							236.5
1958							247.4
1959							254.6
1960							240.9
1961							253.1
1962							256.9
1963							249.1
1964	165.1	357.1	331.9	254.2	166.5	65.4	234.2
1965	153.6	346.4	319.2	237.0	145.8	67.6	220.7
1966	146.6	328.0	298.7	224.8	156.3	61.9	210.1
1967	121.9	309.3	291.7	227.4	145.8	58.4	196.7
1968	130.9	301.0	281.3	204.8	136.6	52.7	190.3
1969	128.3	302.5	276.0	197.6	127.3	44.4	185.3
1970	111.0	303.5	285.8	202.9	134.2	63.9	185.1

* For 1951-1963: Based on all births per year.
For 1963-1970: Based on births by mothers aged 15-44, per year.

TABLE 19

Percentage Change in Age-specific Fertility Rate

Period	15-19	20-24	25-29	30-34	35-39	40-44	15-44
1964—1965	— 6.9	— 2.8	— 3.8	— 6.7	—12.4	+ 3.4	— 5.7
1965—1966	— 4.5	— 5.3	— 6.4	— 5.1	+ 7.2	— 8.4	— 4.8
1966—1967	—16.8	— 5.7	— 2.3	+ 1.1	— 6.7	— 5.6	— 6.3
1967—1968	+ 7.3	— 2.6	— 3.5	— 9.9	— 6.3	— 9.7	— 3.2
1968—1969	— 1.9	+ 0.4	— 1.8	— 3.5	— 6.8	—15.7	— 2.6
1969—1970	—13.4	+ 0.3	+ 3.5	+ 2.6	+ 5.4	+43.9	— 0.1
1964—1970	—32.7 *	—15.0	—13.8	—20.1	—19.3	— 2.2	—20.9

* Computed as follows:

$$\frac{\text{1964 fertility rate} - \text{1970 fertility rate}}{\text{1964 fertility rate}} \times 100\ \%.$$

For an analogous treatment, see Freedman 1967: 3-17.

effected the greatest depression on the general fertility rate between 1964 and 1970, as Table 20 demonstrates. This is because the fertility rate of the 20-24 group is the highest of all cohorts. To illustrate this point, Table 20 reflects the absolute decline in fertility which was calculated in Table 18. These absolute figures allow the computation

TABLE 20

The Contribution to the General Decline of Fertility Between 1964 and 1970 of Different Age Groups, in Absolute Numbers and Relative Percentages

	15-19	20-24	25-29	30-34	35-39	40-44
In Absolute Numbers	54.1	53.6	46.1	51.3	32.3	1.5
% of Total Decline	22.6 *	22.4	19.2	21.4	13.5	0.6

* Computed as follows:

$$\frac{54.1}{(54.1 + 53.6 + \ldots\ldots + 1.5)} \times 100\ \%$$

of each age group's contribution to the total decline of recorded births, and show the great influence of the 20-24 age group.

That the fertility rates for the younger age groups decreased more than for the older ones probably results from the fact that contraceptives (pill) have become readily obtainable only since 1960, and because the availability of information on birth control is of even more recent origin. Thus, the possibility of family planning occurred while the younger groups had not yet, or only just, begun to form their families, while the older groups already had several children.

In summary, then, the increase in the birth rate between 1943 and 1962 is in fact a rise in fertility. Improved medical conditions probably were important. The decline in the birth rate after 1962 is also due to a change in fertility rates, and probably associated with the increase in voluntary birth control since 1960.

It is interesting to trace the degree to which the actual fertility of Surinam (determined in part by social conditions, as expressed in the figures of Table 18) deviates from the biological potential which, as Lorimer (1958: 51) described it, is "the proportion of women who are capable of bearing live offspring at successive ages if exposed to risk of conception in conjugal unions (P)" where:

$$P = A \times B \times C, \text{ in which}$$

A = the percentage of women of a certain age who have their first child at that age when exposed to risk of conception. It is assumed that biological factors which affect fertility negatively (such as pregnancy and menopause) play no role. In formula:

$$A = \frac{1}{1 + e^{1.2\,(18.0 - a)}}$$

e = the base of the natural logarithms (= 2.7183 . . .).

18 = the age at which 50 % of all women could have their first child, if exposed to risk of conception, etc.

a = the "age", time of delivery of a mature foetus (10, 11, 12, 13 years or later), not age at conception.

The definition of A does not take into consideration factors which have a reductive effect on procreation. To correct this, factors B and C are applied. B = that portion of the percentage of women mentioned

under A at a given age, who have their first child at that age regardless of the negative influence on fertility of pregnancy.

$$B = 1 - 0.01\, e^{\left(\frac{a - 16.5}{12} + 1.386\right)}, \text{ where}$$

16.5 = the age at which pregnancy begins to produce an increasingly negative influence on procreation.

Besides pregnancy, menopause reduces procreation. This influence is corrected for by factor C:

C = That portion of the percentage of women of that certain age named under A, who have their first child at that age regardless of the negative influence on fertility of menopause.

$$C = 1 - \frac{1}{1 + e^{8\,(46.5 - a)}}, \text{ where}$$

46.5 = the age at which the negative influence of menopause upon fertility reaches its peak.

It may now be proposed that $P\,(= A \times B \times C)$ is equal to the percentage of women capable of procreation, considering the negative effects of such biological factors as pregnancy and menopause.

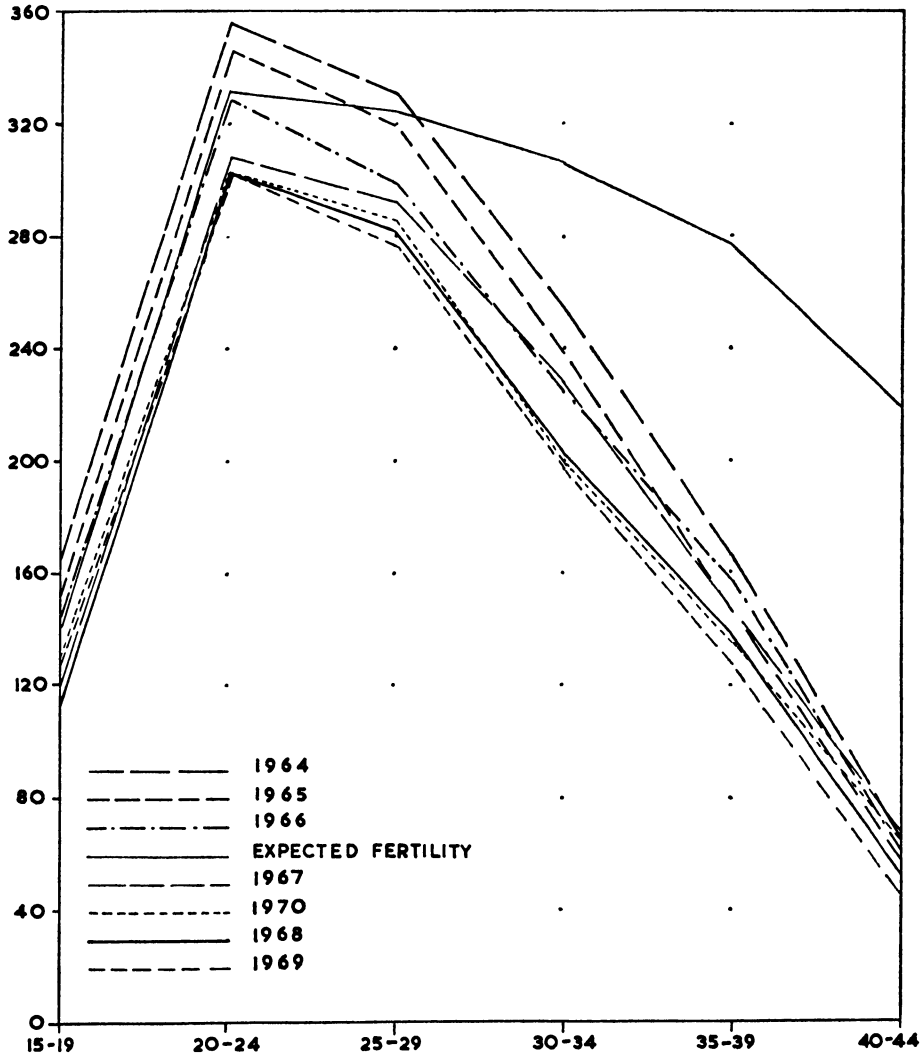
Based on the assumption that the number of live births per year per woman is 0.36, the fertility rates for women of different ages are calculated on the basis of the aforementioned hypothetical model. This model is characterized by a unimodal curve skewed to the left with exceedingly low frequencies at the extremes. Figure 6 shows that for the lower age groups (15-19, 20-24, and 25-29) the differences between the actual Surinam rates and those generated by the hypothetical model are minor. On the other hand, the differences for the higher age groups are impressive.

Later publications (e.g. Bourgeois-Pichat 1965), based upon more precise information, indicate that fecundity is influenced by several

Figure 6

A COMPARISON OF SURINAM FERTILITY WITH EXPECTED

FERTILITY RATES



biological factors. On the basis of three of these factors, Bourgeois-Pichat (1965: 415-419) constructed 8 types of the age curve.

For a comparison between the actual fertility of Surinam and 5 principal types of the age curve of fertility (affected by social factors), see Pavlik (1971: 386-388).

§ 2.2. ETHNICALLY DIFFERENTIATED FERTILITY

Table 21 and Figure 7 illustrate that the fertility trends (a rise in the birth rate followed by a decline) which were noted for the country at large hold true for each of the ethnic groups. The data also show that the fertility rates are higher for the Hindustani than for the Creoles and the Javanese. Although generally the birth rates for the Creoles have been higher than for the Javanese, during the last years the fall in fertility for the Creole group has been so steep that since 1962 their birth rate is the lowest.

The high fertility level among the Hindustani is not restricted to Surinam. In other countries where they form a relatively large percentage of the population, their birth rates are generally higher than those for other population groups (Lorimer 1958: 178). For Guyana, this is indicated both in the crude birth rate and in the gross reproduction rate (Roberts 1948: 205, 206, 207). The fact that the Hindustani once had lower birth rates than the Creoles in Guyana (between 1910 and 1912 and perhaps earlier) may have been a function of the surplus of males at that time, which created a sex ratio which did not encourage high birth rates. This situation resulted from the immigration of Hindustani to Guyana, which began in 1838. If instead of the birth rate the reproduction rate is computed, then the Hindustani prove to have higher ratios than all other groups, even in the aforementioned years.

For Trinidad and Tobago, the Hindustani figures are also the highest. In 1943-1946, and again in 1960, they produced more children per 1000 mothers than any other group. This difference held true for all age categories (Roberts 1971: 706, 707).

In South Africa, some years ago, the net reproduction rate of the Hindustani was higher than 2, while for the Bantu and the "Coloured" populations it was less than 2. This was true for all geographic areas as well for the years 1911 and 1936 (Badenhorst 1952: 155-157).

In East Africa, the Hindustani living in Kenya, Tanzania and Uganda also have a high fertility (Martin 1953: 238, 240, 244).

In order to gain some insight into the background of ethnically differentiated fertility, an effort will be made to discover whether the

TABLE 21

Live Births Between 1923 and 1970, by Ethnic Group, in Numbers and per 1000 Population

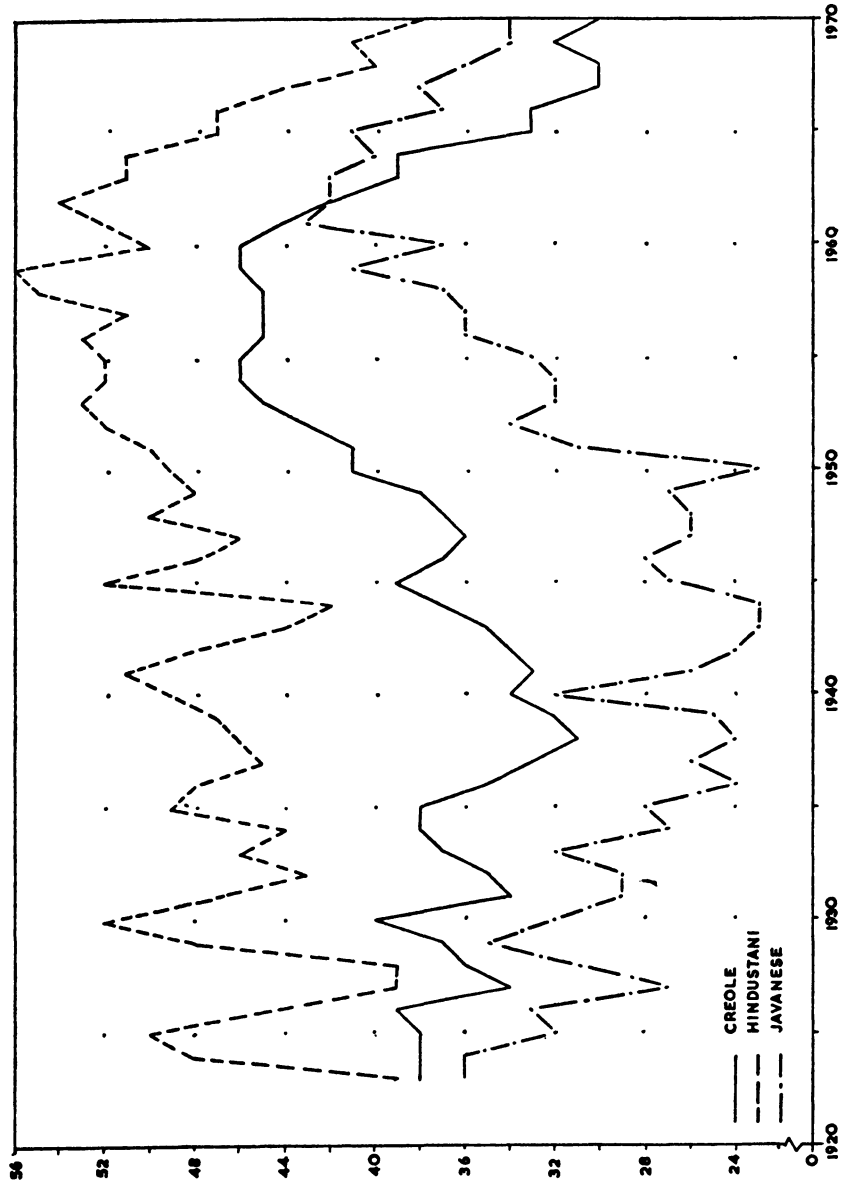
	Numbers			Per 1000		
Year	Creole	Hindustani	Javanese	Creole	Hindustani	Javanese
1923	1719	1029	586	38.2	39.1	36.8
1924	1762	1295	615	38.2	48.2	36.7
1925	1836	1387	607	38.9	50.1	32.8
1926	1842	1298	708	39.0	45.6	33.4
1927	1605	1143	648	34.0	39.4	27.2
1928	1761	1180	808	36.8	39.8	31.4
1929	1793	1480	966	37.3	48.6	35.5
1930	1948	1639	498	40.1	52.5	—
1931	1705	1500	848	34.5	47.0	29.7
1932	1804	1414	873	35.8	43.3	29.9
1933	1928	1548	957	37.5	46.3	32.0
1934	1999	1530	855	38.0	44.4	27.9
1935	2081	1753	880	38.7	49.1	28.5
1936	1921	1765	759	35.0	48.1	24.5
1937	1870	1729	785	33.3	45.3	26.0
1938	1805	1843	706	31.4	46.4	24.0
1939	1885	1919	769	32.3	47.2	25.8
1940	2064	2059	1009	34.8	49.1	32.6
1941	1966	2257	829	33.0	51.6	26.0
1942	2100	2167	797	34.7	48.0	24.8
1943	2227	2069	764	35.7	44.2	23.7
1944	2383	2099	765	37.4	42.8	23.8
1945	2569	2668	876	39.2	52.6	27.6
1946	2546	2570	892	37.7	48.9	28.1
1947	2528	2536	851	36.7	46.7	26.5
1948	2608	2842	883	37.1	50.7	26.9

	Numbers			Per 1000		
Year	Creole	Hindustani	Javanese	Creole	Hindustani	Javanese
1949	2705	2714	944	38.5	46.3	27.7
1950	2933	2951	813	41.5	48.0	23.1
1951	3021	3251	1122	41.5	50.9	31.4
1952	3271	3517	1274	43.5	52.8	34.9
1953	3545	3728	1213	45.6	53.5	32.5
1954	3756	3826	1243	46.6	52.6	32.7
1955	3909	3966	1307	46.7	52.2	33.6
1956	3913	4220	1449	45.1	53.2	36.4
1957	4072	4248	1504	45.2	51.3	36.9
1958	4283	4838	1571	45.9	55.8	37.5
1959	4540	5141	1783	46.8	56.5	41.4
1960	4678	4832	1651	46.4	50.7	37.3
1961	4613	5210	1980	44.1	52.3	43.4
1962	4570	5662	2007	42.2	54.3	42.7
1963	4463	5626	2023	39.8	51.6	42.2
1964	4520	5825	1986	39.0	51.1	40.7
1965	3983	5682	2096	33.5	47.8	41.7
1966	4058	5858	1964	33.4	47.3	37.9
1967	3740	5717	2059	30.3	44.5	38.7
1968	3847	5427	1989	30.8	40.8	36.3
1969	4081	5738	1912	32.4	41.9	34.1
1970	3804	5389	1998	30.2	38.3	34.8

factors which are usually mentioned in the literature as having effects upon reproduction among different ethnic populations are also at work in Surinam. The commonly mentioned factors are: family structure, socio-religious structure, and sex ratio. Other factors which may have an influence include the frequency with which partners are replaced, and the "frontier mentality". These latter variables have not been systematically examined for lack of research time.

Figure 7

LIVE BIRTH RATES PER 1000 INHABITANTS BY ETHNIC GROUPS



§ 2.2.1. FAMILY STRUCTURE

Among Caribbean populations three forms of the family are distinguished. These are usually referred to as marriage, common-law, and visiting union. For a discussion about the role of socio-economic and other factors in the evolution of these family structures, see the studies on matrifocality (e.g., Rodman 1971; Smith 1971). Various researchers have demonstrated links between these family types and fertility, in the sense that the birth rate is highest among those who are married, and lowest among those who form visiting unions.

Since these family types also occur in Surinam, according to the census data (see also Buschkens 1973: 56-58, 124-125), it is necessary to investigate whether the Caribbean findings regarding fertility are mirrored here.

The visiting union is a form of cohabitation between a male and a female which is not characterized by permanence, and which has no legal basis. In short, the category "visiting union" concerns unmarried women with or without children. It is distinguished from the category "common-law" because the woman does not share a domicile with a male on a permanent basis. Common-law, also known in Surinam as "concubinage", is described as permanent cohabitation without a legal basis (Abraham-van der Mark 1969: 72-104; Cumper 1966; Leridon 1970: 65; 1971: 277-300; Marks 1973: 46-58; Roberts 1967a: 20 ff; 1967b: 95; 1967c: 102 ff; 1967d: 148).

As these publications indicate, the West Indian students see a connection between women's fertility and the family structure. Other areas have delivered the same conclusions. The usual focus is upon polygyny as a factor in female reproduction. Although not all cases show a negative relationship between polygyny and fertility, there is a general tendency to that effect. A number of reasons have been suggested. One is, that it is especially the males in childless marriages who decide to take a second wife. The purpose here is procreation. Obviously such cases cannot be interpreted to mean that polygyny results in lowered fertility. A second theory suggests that the potential spread of venereal disease is greater in polygamous than in monogamous marriages (see Dorjahn 1958; Romaniuk 1967: 251-259; for this and related cases). In view of these suggestions, we may tentatively assume a negative relationship between polygyny and fertility. This assumption is bolstered by a variety of researchers. Henin, reporting on the Sudan, concludes that co-wives of a single husband have lower fertility rates than the wives of monogamous men. Although the difference appears clear from

his tables, Henin admits that this does not conclusively demonstrate the polygyny-fertility link, "since the data were not controlled for other variables, e.g. age at marriage and proportions childless" (Henin 1969: 184-185). Similar conclusions were reached by van de Walle for Congo (see Brass 1968: 230, 231). On the other hand, the link is far less convincing for another West African country: Guinea. Then again, in Tanzania, like the Sudan in East Africa, polygyny is negatively related to fertility (de Jonge 1971: 65-68).

There are problems in linking fertility to family structure. So far, the family forms have been considered as types. They may, however, be seen as phases through which a family passes. Since the point of passage from one phase to another cannot be stipulated exactly for all cases, one cannot simply correlate fertility with family organization. One notes that some of the children of mothers registered as married may have been born while these women were still living in common-law or an unmarried state. As indicated in the following review, the percentage of mothers who are married is highest for the higher age brackets, and lowest for the youngest groups. The relationship is reversed for unwed mothers.

Table 22 based on the figures of the 1964 census indicates that many women begin their families as unwed mothers, or as common-law wives, and that they marry only after they have had a number of children. In view of the fact that this phenomenon does not — or almost not — occur among the Hindustani and the Javanese, Table 22 is misleading. Because it does not differentiate ethnic groups, it does not sufficiently indicate the role which this form of cohabitation has on the Creole population. This bias is corrected in Table 23.

To illustrate the difficulty of linking fertility and family form, consider the case of an 18-year-old woman who enters into a common-law relationship. Assume the affiliation lasts for 10 years, during which she gives birth to four children. Further assume that at the end of this decade the concubinage is replaced with an actual marriage, and that a few years after the wedding a population census is held. The woman registers as "Married" on the census forms. If another two children are born to her after the marriage, then all six of her children will belong to a married woman, while in fact only two were born in wedlock. In other words: the last two children constitute data on the fertility of the marriage, but *not* on the fertility of the common-law relationship. With the first four children the situation is reversed: they indicate the fertility of concubinage, but not of marriage. An answer to this problem is

TABLE 22

Mothers by Type of Family or Marital Status, per Quinary Age Group in Percentages of Each Age Group, on March 31, 1964 (Excludes Bush Negroes and Indians)

	< 15	15-19	20-24	25-29	30-34	35-39	40-44	≧ 45	Total
Visiting Relationship + Common-Law	100.0	36.1	33.4	29.8	27.5	26.2	27.0	29.6	29.4
among which: Visiting Relationship	100.0	25.5	20.5	14.8	13.1	12.7	13.7	21.2	17.4
Common-Law	0.0	10.6	12.8	15.0	14.3	13.5	13.2	8.4	11.9
Married + Widowed + Divorced	0.0	63.8	66.5	70.1	72.4	73.6	72.9	70.2	70.5
among which: Married	0.0	62.3	63.9	65.9	66.6	65.9	63.4	47.6	59.4
Widowed	0.0	0.7	0.9	1.3	1.8	3.0	4.2	14.4	6.1
Divorced	0.0	0.7	1.6	2.9	3.9	4.6	5.2	8.2	4.9
Total	100.0	99.9	99.9	99.9	99.9	99.8	99.9	99.8	99.9

TABLE 23

Mothers by Type of Family or Marital Status, per Quinary Age Group in Percentages of Each Age Group, on March 31, 1964 (Excludes Bush Negroes and Indians), Creole

	< 15	15-19	20-24	25-29	30-34	35-39	40-44	≧ 45	Total
Visiting Relationship + Common-Law	100.0	90.3	74.9	60.6	53.2	48.3	45.0	45.0	52.5
among which: Visiting Relationship	100.0	73.3	52.0	34.3	28.6	25.9	25.0	34.2	34.3
Common-Law	0.0	17.0	22.8	26.2	24.5	22.3	20.0	10.8	18.2
Married + Widowed + Divorced	0.0	9.5	25.0	39.3	46.7	51.6	54.9	54.9	47.3
among which: Married	0.0	9.2	24.0	36.7	42.5	46.0	46.7	34.0	36.0
Widowed	0.0	0.1	0.3	0.8	1.1	1.9	3.1	14.9	6.7
Divorced	0.0	0.1	0.7	1.7	3.0	3.6	5.1	5.9	4.0
Total	100.0	99.8	99.9	99.9	99.9	99.9	99.9	99.9	99.9

possible by relating the number of years a woman has been married to the number of children the marriage has produced. Analogously, one could compare the years a woman lived in common-law with the number of children born during that period. Unfortunately, this is not possible with the existing Surinam statistics. Therefore the only solution is to estimate the fertility of (un)married registered mothers on the basis of the number of (un)married registered mothers and their children. Actually, the objections to this approach are not insurmountable. To return to the previous example: Four children were born in the first stage, two in the second. Although we cannot suppose that all six of her children were born either in wedlock or all out of wedlock, it is equally unrealistic to postulate that the rate of reproduction remains a constant. After all, four children were born in the first ten years, that is to say, one each 2½ years. Two children were born in the four married years, or one every 2 years. Concubinage thus had a lower fertility than marriage.

This example is meant to indicate that the number of children born of a marriage is smaller than the number of children registered to a married mother. It does not prove that the fertility rate of married women is less than that of unmarried ones. The number of married mothers must also be lower, since they have been married for a shorter period than the registration would indicate. Therefore, it is taken for granted that the fertility of married mothers may be computed on the basis of the number of mothers registered as married, and their children (Marino 1970: 161; Roberts 1967a: 35).

For the English-speaking countries of the Caribbean, the fertility of married mothers is higher than that of unmarried ones, as Table 26 indicates.

For Surinam in 1964, the same fertility differentials were noted for the different types of cohabitation. These results apply to the country as a whole, and generally also to the different ethnic groups and the Districts. As Table 27 based on the figures of the 1964 census illustrates, the Hindustani have the highest ratios for all types, and the Javanese the lowest. This is reaffirmed by an examination of the District data (Table 28) based on the census. Nickerie, Saramacca and Suriname — the traditional Hindustani Districts — have the highest ratios. Marowijne, a predominantly Creole District, offers the lowest ratios. Only for Coronie can it be concluded that the fertility ratio of married mothers is lower than that of mothers living in common-law relationships.

TABLE 24

Mothers by Type of Family or Marital Status, per Quinary Age Group in Percentages of Each Age Group, on March 31, 1964 (Excludes Bush Negroes and Indians), Hindustani

	< 15	15-19	20-24	25-29	30-34	35-39	40-44	≧ 45	Total
Visiting Relationship + Common-Law	100.0	14.3	11.3	12.1	10.3	10.3	11.9	14.4	12.2
among which: Visiting Relationship	100.0	8.5	5.1	4.3	3.2	3.8	4.6	8.5	5.5
Common-Law	0.0	5.8	6.2	7.8	7.1	6.5	7.3	5.9	6.7
Married + Widowed + Divorced	0.0	85.5	88.4	87.7	89.4	89.5	87.8	85.3	87.5
among which: Married	0.0	84.3	85.4	82.7	81.8	78.9	76.4	57.1	75.7
Widowed	0.0	0.9	1.2	1.6	2.6	4.6	5.7	14.7	5.6
Divorced	0.0	0.3	1.8	3.4	5.0	6.0	5.7	13.5	6.2
Total	100.0	99.8	99.7	99.8	99.7	99.8	99.7	99.7	99.7

TABLE 25

Mothers by Type of Family or Marital Status, per Quinary Age Group in Percentages of Each Age Group, on March 31, 1964 (Excludes Bush Negroes and Indians), Javanese

	< 15	15-19	20-24	25-29	30-34	35-39	40-44	≧ 45	Total
Visiting Relationship + Common-Law	0.0	16.0	14.4	12.8	11.3	10.0	13.5	14.1	13.2
among which: Visiting Relationship	0.0	6.8	4.9	3.2	3.0	1.9	4.4	7.6	5.1
Common-Law	0.0	9.2	9.5	9.6	8.3	8.1	9.1	6.5	8.1
Married + Widowed + Divorced	0.0	83.8	85.4	86.9	88.5	89.8	86.2	85.7	86.5
among which: Married	0.0	80.9	81.3	81.0	81.8	82.0	77.4	66.7	76.0
Widowed	0.0	0.9	1.4	1.7	1.9	2.8	4.7	11.7	5.4
Divorced	0.0	2.0	2.7	4.2	4.8	5.0	4.1	7.3	5.1
Total	0.0	99.8	99.8	99.7	99.8	99.8	99.7	99.8	99.7

TABLE 26

Average Number of Live-Born Children per Mother over Age 44, by Marital Status and Country, in 1946 *

	Barbados	British Honduras	Jamaica **	Leeward Islands	Windward Isles
Unmarried	4.14	4.73	4.74	4.41	4.58
Married	5.61	6.38	6.64	6.38	6.82
Common-Law	4.43	5.41	5.60	5.35	5.64

* After Roberts 1955.

** Year 1943.

It thus appears that the fertility ratios are highest for married mothers and lowest for unwed mothers, with common-law giving the middle ratios.

The figures also show that the average number of live births per mother over the age of 44 is 30 % lower for unwed than for married mothers. This percentage agrees with the findings for Jamaica. Research there by Davis and Blake (1956: 15) found an estimated 37 % "reduction in fertility due to instability of unions". It must be noted, however, that in Puerto Rico the fertility of "consensual marriage" is higher than that of "legal marriage". This does not contradict the data for the other Caribbean territories and Surinam, because their typologies (consensual and common-law) do not have exactly the same meaning (Stycos 1955: 105-107, 244; 1968: 108, 109). The seeming exception and the background to this low fertility ratio do require explanation, however. Regrettably, almost no research has been done on the types of man-woman relationships in Surinam. But since the same types have been noted in other Caribbean areas, and since furthermore a number of other similarities exist in the family types of Surinam and these other societies, it seems reasonable to treat the Surinam data on the basis of these latter countries. Thus, where no data exist on Surinam, comparisons will be drawn with the Caribbean area.

TABLE 27

Average Number of Live Births per Mother Aged 45 or older, by Type of Family or Marital Status and Ethnic Group on March 31, 1964 (Exclues Bush Negroes and Indians)

	Creole	Hindustani	Javanese	Total *
Visiting Relationship	4.32	5.14	3.81	4.39
Married	5.98	7.54	4.21	5.96
Common-Law	5.59	5.76	3.68	5.37
Widowed	5.53	6.44	4.03	5.53
Divorced	5.32	6.26	3.81	5.49
Total	5.26	6.89	4.09	5.48

* Total includes other unmixed ethnic groups.

For Jamaica, the relatively low fertility rates of women living in concubinage appear to be related to such varied factors as the low frequency of sexual relations, the chances of transmitting venereal diseases, and the fear of pregnancy. The low frequency of intercourse, a result of the temporary but frequent separations of the man and woman, here concerns primarily the period between the ending of one relationship and the time when a new family is formed. Concerning his research in Jamaica on this point, Stycos writes: "these conclusions showing the strong and independent relations of age and sexual frequency to conception, help to explain the low fertility of our sample women: (1) Visiting relations are characterized by relatively infrequent sexual relations. (2) A high proportion of total mating experience is spent in visiting time and this is especially true in the earlier union of women prior to age 30. (3) Therefore fertility may be lowered both because of periods of non-exposure between unions (and most turnover occurs prior to age 30) and because a considerable proportion of intra-union time in the most fertile age period is characterized by infrequent sex relations. Furthermore, by the time the female enters a domiciliary relation, age reduces the chances for conception both by lowering

TABLE 28

Average Number of Live Births per Mother over Age 44, by Type of Family or Marital Status and District, on March 31, 1964 *

	Nickerie	Coronie	Saramacca	Paramaribo	Suriname	Brokopondo	Commewijne	Marowijne	Total
Visiting relations	4.95	3.67	4.80	4.12	5.03	— **	4.99	4.32	4.39
Married	6.26	5.50	5.90	5.82	6.29	— **	5.36	5.26	5.96
Common-Law	4.68	6.45	4.46	5.32	5.76	— **	4.50	4.78	5.37
Widowed	6.04	5.70	5.83	5.54	4.75	— **	5.20	4.41	5.53
Divorced	4.67	8.00 **	6.00 **	4.64	5.89	— **	4.21	— **	5.49
Total	5.86	5.18	5.73	5.15	5.93	4.76	5.22	4.92	5.48

* Excludes Bush Negroes and American Indians.
** Sample size too small to allow exact computation.

fecundity and should, according to data collected in the United States, reduce the frequency of intercourse. That this frequency in fact appears high relative to that characteristic of visiting relations, shows the infrequency of coitus in the visiting status" (Stycos 1968: 196-197. See also Stycos and Back 1964: 137-144, 170-172, 184, 185). The instability of concubinage and visiting relations are demonstrated in the fact that for 20 % of the married women aged 30 to 40 "the union has broken up", while the equivalent for women living in common-law unions was 48 %, which rose to 84 % for the unmarried mothers (Stycos and Back 1964: 131-133).

Not only the lower frequency of intercourse affects the fertility of unstable families. The high turnover in sexual partners increases the transmission of venereal disease. For their Jamaica data, Stycos and Back do not omit this possibility: "Since women in less stable relationships show a history of more sexual partners than do women in more stable unions, the risk of contracting a sterilizing infection would be greater for them" (Stycos and Back 1964: 186). Tekse (1968: 10) also cites the possible relationship between V.D. and the low fertility of unstable unions in Jamaica. But since these authors acknowledge only the possibility of the relationship, it seems appropriate to bolster the argument with data from a different region. Romaniuk offers figures for the Congo which lead him to the following conclusion: "Outre la dissolution des marriages, la mobilité conjugale, avons-nous dit, est susceptible d'affecter la fecondité parce que l'echange frequent des femmes peut contribuer à la dissemination des maladies vénérienes responsables de la sterilité" (Romaniuk 1967: 263, see also van de Walle 1971: 2167).

A third factor cited by Stycos as a negative influence on fertility is the fear these women have of pregnancy, a fear which was discovered through interviews (Stycos and Back 1964; see also Abraham-van der Mark 1969: 84; Blake 1961: 186, 187).

The foregoing discussion and Tables 27 and 28 have demonstrated the lower fertility of the common-law and visiting relationships. Since both these family forms occur more often among Creoles than among Hindustani (as Tables 23-25 indicate), the difference in the reproductive levels of these two groups is partly explained. A further comparison with Table 27 is illuminating: it shows that when any single form of the family is compared for the two groups, then the Hindustani always have a higher rate than the Creoles. It must thus be assumed that family

type alone cannot explain the total difference in fertility between these groups.

It was noted earlier (§ 2.2.) that the Javanese have the lowest birth rate. It was not possible to ascertain to what extent this is a function of family type, since for the Javanese as for the Hindustani, legal marriage is the typical form. However, it appears that Javanese marriage is less stable than that of the Hindustani. Among Javanese, who are Moslems, divorces ("rejections") are easily and relatively frequently obtained. Furthermore, according to de Waal Malefijt (1963: 122): "there is a very high incidence of marital infidelity both on the part of the men and the women."

§ 2.2.2. SOCIO-RELIGIOUS FACTORS

There are obvious religious differences between the three ethnic groups. The Creoles are predominantly Christians, the Hindustani are Hindus, and most of the Javanese are Muslims. The question is whether ethnic fertility rates are related to the different religions of these groups.

TABLE 29

Average Number of Live Births per Mother over Age 44, by Religion, on March 31, 1964 (Includes Bush Negroes and Indians)

Hindu	Mohammedan	Moravian Brethren	Catholic	Total *
7.0	4.8	5.3	5.4	5.4

* Includes Dutch Reformed, Evangelical Lutherans, Confucianists, Others, Unknown. These categories were too small to be included separately.

According to Table 29 based on the 1964 census, the average number of live births per mother is highest for Hindus, lowest for Mohammedans. Since Hindus have the highest fertility, it is necessary to discover which aspect of their belief system creates this positive influence on the birth rate.

In order to explain the meaning of wedlock in the birth rate, some clarifications are in order. In Hinduism the question of status in the next life-phase plays an important role in rebirth (*samsara*). This new status, in terms of a higher or lower caste, is determined by *karma,* whose effect is partly determined by *dharma,* the way in which religious

obligations have been fulfilled. These duties generally may only be performed by a son of the deceased. Furthermore, it is only the sons who remain members of the joint family. Daughters are no longer part of this unit after their marriage. Religion is thus involved in the very strong desire for sons among the Hindustani, and helps explain the formation of the family. This importance is expressed in the high frequency of marriage and the early age at which families are formed (Bergel 1962: 38-41). Although this does not explain the large size of Hindustani families (Sheps 1963: 67), it must be considered a factor in the high fertility of this group as compared to Creoles and Javanese. In this connection, it must be noted that in the present study all Hindustani, regardless of whether they were in fact Hindus or Muslims, were considered as a single entity for the investigation of family organization.

Besides guaranteeing group-continuity and stimulating the procreative urge, there is another reason for the importance of marriage among the Hindus. Marriage is seen as one of the four *ashramas,* the phases of a person's existence. It is therefore a necessary aspect of life on earth, and a religious duty (Speckmann 1965: 63, 152).

Although some data exist on the frequencies of marriage and the age at which family-forming begins among the three ethnic groups, this information is lacking for the religious communities. Nevertheless, some insight can be gained by noting differences in the percentages of women who procreate before their twentieth birthday. It is clear, as Table 30 based on the census indicates, that the Hindus occupy a favorable position in regard to fertility.

TABLE 30

Motherhood Among Women Aged Less than 20 Years, by Religion, on March 31, 1964

	Hindu	Mohammedan	Moravian Brethren	Catholic	Total *
% Mothers	4.8	5.2	2.6	3.7	4.1

* Includes Dutch Reformed, Evangelical Lutherans, Confucianists, Others, and Unknown. These categories were too small to be mentioned separately.

The religious concepts just outlined — especially *samsara, karma* and *dharma* — and the associated desire for sons, appear to help fulfill a socio-economic function. The attention to religious demands is in part generated by a desire to achieve a high(er) socio-economic position in the next incarnation by being born into a high(er) caste. This relationship between socio-economic position and religious dogma among the Hindus of Surinam was made clear to me in conversations with farmers, high school pupils and students at normal schools. The farmers were asked the "why" and "for what reason" of these religious concepts. A general impression about their evaluation of various cultural phenomena, including Hinduism, was gathered from the pupils during lessons in the subject of social studies. Notable was the observation, made by some Hindu farmers as well as students, that in Surinam the idea of reincarnation into a higher caste is becoming less important "because in Surinam you can get a good job even if you belong to a low caste." This observation is understandable in view of the fact that the rigidity of the caste system in Surinam, and therefore the barriers to social mobility within the Hindustani population, have declined considerably during the last years.

A comparison with other countries lets us measure whether the Hindus' preoccupation with marriage and procreation is also found among groups outside of Surinam.

Roberts (1948: 215) identifies the strong desire for sons as one of the main reasons for the high fertility of Guyanan Hindustani, and mentions as another cause the early age at marriage. However, he offers no figures, and does not mention marriage frequency.

For Trinidad and Tobago it appears to again be true that the Hindustani begin their families at an earlier age than the Creoles. The former enter into a union at an average age of 16.2 years, the latter at 21.4. This difference holds for all types of the family, that is to say, for marriage, common-law and visiting relationships (Roberts and Braithwaite 1967d: 154-155). Figures for marriage frequency are lacking for both groups, and no mention was made of the desire for sons among Hindus.

The Hindustani in East Africa — Kenya, Tanzania, and Uganda — also have a high fertility ratio, which is related to their low age at marriage (Martin 1943: 237, 244). The desire for sons is also noted.

In South Africa the high fertility of the Hindustani has been noted, especially when they are compared to the Bantu. "It is known, however, that among this [Hindustani] group in particular there are strong

cultural forces favoring high fertility, such as early marriages, religious beliefs, family mores and folkways connected with reproduction and child rearing" (Badenhorst 1952: 158). This author also fails to report figures on frequency of marriage, age at marriage, and does not mention the desire for sons among both groups.

Although the aspects of desire for sons, frequency of marriage and age at marriage were not comparable for Hindustani living outside of Surinam because of a lack of information, it appears that the family structure is characteristic.

The desire for sons explains in part both the factors of early marriage and high marriage frequency. Among Christians such desires are not that strong, nor were they so central in the religions of West Africa, the Creoles' place of origin. The Ashanti have a belief that the personal *ntoro* (spirit) is transmitted from ancestor to descendant, according to Lorimer (1958: 183, 267), who notes that "in earlier times" a man desired sons so that the "worship of his ntoro" could be continued. However, as far as I know neither in Christianity, to which most of the Creoles belong, nor in the native religions of such places as Congo (Romaniuk 1967: 268), is there any equivalent to the religious obligation which characterizes Hinduism in Surinam, India, China, and Japan (Fagley 1965: 78; Lorimer 1958: 160; Liu 1954: 959). This is affirmed for Tanzania (East Africa) by de Jonge (personal communication, 1972), who studied that area. One notes that ancestor worship is common in West Africa, but that the person who prepares the offering need not be a biological son.

Where the Hindus have the highest fertility, the Muslims show the lowest ratios. This is remarkable because in other countries they generally have a very high reproductive rate, sometimes — as in India (Davis 1951: 80) — even higher than that of the Hindus. In Trinidad also, the Mohammedans have higher birth rates than their Hindu compatriots (Roberts and Braithwaite 1967b: 99). It would be useful to compare these groups in Guyana with South and East Africa. Unfortunately, such data are not available. In these other cases, the Mohammedans and the Hindus usually belong to the same ethnic groups. This is not true in Surinam: Most of the Moslems here are Javanese, and this ethnic group traditionally has a low reproductive rate. On the other hand, the Hindus descend from contract laborers recruited in India, and Hindustani normally have a high birth rate.

The foregoing discussion concerned two factors which probably affect the differential fertility of the ethnic groups: family organization and

socio-religious norms. It was noted that the relatively low reproductive rate of the Creoles could be explained on the basis of the former variable, and that the high birth rate of the Hindustani resulted from the second factor. The low ratios for the Javanese have not been explained. The following section will consider to what degree their fertility is a function of high sex ratios and the application of traditional birth control methods.

§ 2.2.3. THE SEX RATIO

Since birth rates are in part a function of sex ratios, the ethnic groups were compared on this variable. The sex-specific immigration of Hindustani and Javanese resulted in a male surplus in both groups. Even though there were also more males than females among the repatriates, this category was so small that the male surpluses persisted (see Appendix III, table 85 and the chapter on emigration). Because the immigration of Hindustani ceased in 1914 while that of Javanese continued until the Second World War, it is understandable that the influence of migration was felt longer among the Javanese than among the Hindustani. And since the birth rate relates the number of live births to the total population, the negative influence of the male surplus was noticed longest among the Javanese. Furthermore, the size of the male surplus was relatively greater for the Javanese, and so was its impact on the birth rate. This partly explains why the Javanese birth rate was lower than that of both the Hindustani and the Creoles, at least until 1962, when for the first time it exceded that of the Creoles. This recent development is also related to the sex ratio. Over the years the sex ratio has become normalized, eliminating the negative effect of the male surplus. Because of this, the Javanese birth rate has climbed in accordance with expectations to a level commensurate with their Moslem religion: a level between the low birth ratios of Creoles on the one hand, and the high Hindu ratios on the other.

Another demonstration of the interference of a large surplus male population lies in the elimination of that factor. This is accomplished by comparing not the birth rates but the fertility rates (available only since 1950) of the Javanese and other groups. As Table 31 shows, this sharply decreases the differences between the Javanese and the other groups. The fertility of Javanese appears to roughly equal that of the Creoles. Note in this connection that the birth rate for Javanese in 1960 was 40 per 1000. This figure does not vary much from the estimate

TABLE 31

Fertility Rates per Ethnic Group, 1951-1970

Year	Creole	Hindustani	Javanese	Totals
1951	184.9	255.8	174.2	205.2
1952	195.4	266.3	194.9	218.4
1953	206.9	271.8	183.5	223.8
1954	214.2	267.7	188.5	228.3
1955	217.6	265.1	197.4	230.4
1956	212.8	270.0	215.1	236.8
1957	216.2	261.7	219.0	236.5
1958	221.4	287.6	222.7	247.4
1959	227.6	294.3	245.7	254.6
1960	227.4	266.0	220.9	240.9
1961	217.3	276.0	257.3	253.1
1962	208.7	288.2	253.6	256.9
1963	201.3	275.4	248.2	249.1
1964				234.2
1965				220.7
1966				210.1
1967				196.7
1968				190.3
1969				185.3
1970				185.1

for the current population of Java in Indonesia (Nitisastro 1970: 96, 145, 146). Since the figures for Java in 1930 were not much lower than those for 1960, it may be assumed that for the Surinam Javanese the birth rates would also not have varied much between 1930 and 1960. The fact that this is not true may be a function of the influence of the sex ratio. Unfortunately, actual data to bolster this supposition are not available.

Among the Creoles, the sex ratio also affected the birth levels. The relatively strong decline of the Creole birth rate after 1962 is related to a change in the sex ratio. This change, in turn, results from the sex- and age-selective emigration of Creoles. The female surplus that resulted has probably affected not only the Creole birth rate but even the fertility rate in a negative manner, and helps explain the differences between

the fertility levels of the Creoles and the other groups. The chapter dealing with emigration will explain how the move to foreign parts affected the sex ratio.

A quite different factor which may have influenced Javanese birth rates in Surinam is that of traditional methods of birth control. Although there are no empirically obtained data, the impression is that birth control is attempted more frequently in this ethnic group than in the others. In Java itself, it has also been noted that a number of traditional methods are employed to prevent pregnancy. Verdoorn, among others, has noted one method, which he describes as "the artificial retroflection of the uterus by a *dukun* (a Javanese midwife)" He and other authors assume, however, that that use of the various contraceptives has had little influence on the fertility level of the population of Java (Breman 1963: 299; Fischer 1943: 250; Timmer 1961: 85; Verdoorn 1941: 59, 60). This does not mean we may conclude that for Surinam Javanese the influence of traditional forms of contraception is necessarily minor.

Finally there are two other factors which may be related to fertility differentials by ethnic group. These are the high turnover in partners among certain groups, and the "frontier mentality" of the Hindustani. As mentioned earlier, these variables must be treated somewhat summarily because of the limited amount of time spent on them during the research. The factor of turnover has been discussed earlier, at the end of section § 2.2.1.

The existence of a frontier mentality in the terms of van Heek (1954: 116) — that is to say, a mentality characterized by a strong and militant group organization and a relatively great religious elan — is indeed noticeable among the Hindustani, who now make up the largest ethnic group in Surinam. The members of this group are aware that in the near future they will achieve a quantitative and therefore a political majority. They view this possibility as realizable because of their group's numerical increases. It is probable that both this future expectation and its interpretation as a realizable goal improve the chances that this majority will come about.

In conclusion, the Hindustani's high fertility is related among other factors to the traditional family and religious organization of this group. The latter is in part the expression of striving for a higher socio-economic position in the next incarnation by being born into a high(er) caste. The low fertility of the Javanese is related to the negative influence of a low sex ratio. The Creoles' low birth rate is partly caused

by the unstable family type of many members of this group, and partly by the changes in the sex ratio since 1960.

§ 2.3. FACTORS RELATED TO FERTILITY DIFFERENTIALS

§ 2.3.1. HYPOTHESIS

From the literature on countries more or less comparable to Surinam (Adelman and Morris 1966: 129 ff; Iutaka *et al.* 1971: 55 ff; McMillan 1967: 196 ff; Stycos *et al.* 1959: 191-253; Zarate 1967: 283 ff) and from my own experiences, I have the impression that in Surinam as elsewhere the variation in fertility among the census tracts is a product of such factors as religion, population density, and education. Other possible factors, such as average income per person, have been ignored because of a lack of information. Knowledge about each of the factors to be considered will support the conclusions about the birth rate in the foregoing section.

It is suspected that such socio-economic factors as population density and industrialization explain more about the variation in fertility rates than do the ethnic or religious variables. A comparison of these factors in the different census tracts will test that hypothesis. The focus will be upon the extent to which fertility is a function of the following factors, as measured in March 1964:

Population density, expressed in number of people per km^2.
Percentage of labor force employed in agriculture.
Percentage of people living in common-law marriage (in § 2.3., common-law includes both common-law and visiting unions).
Percentage of women aged 15-44 with grade school or less education.
Percentage of women aged 15-44 whose primary language is Dutch.
Percentage Hindu.
Percentage Roman Catholic.
Percentage Mohammedan.
Percentage Protestant.
Percentage Creole.
Percentage Hindustani.
Percentage Javanese.

§ 2.3.2. DESCRIPTION OF BASIC CONCEPTS

The preponderance of the material refers to 1964, the year of the Third General Population Census. The information in the Fourth Census, which was held in December 1971, was not yet available during the research stage of this effort. Furthermore, the total population by census tracts is available only for 1964. Fertility rates therefore can only be computed for this one year.

For the statistical purposes of this chapter, the fertility index will be described in terms of the number of live births per year to women between the ages of 15 and 44.

People living in common-law (concubinage) relationships are those who are so registered in accordance with their own statements.

Religion and ethnicity are also in accord with respondents' own declarations.

No attempt will be made to investigate the accuracy of the registered information.

There are a number of suppositions regarding the relationship between fertility differentials and the 12 explanatory variables. It is generally accepted that urbanization is negatively correlated with fertility. It is expected that this will hold true for Surinam. One reason is the cost of raising children. This will be highest in the census tracts with the greatest population density: those of Paramaribo and its surroundings. The tracts of the agrarian Districts should therefore report more children per family than the urban ones. The tendency to practice family planning in the cities is bolstered by the fact that city children contribute less to the family income than their age-mates do in the rural Districts. But not only the willingness to use contraceptives is greater among city-dwellers: they also generally have more information about the use of such devices. In other words, in the census areas with the highest population densities, the percentage of the population which is familiar with contraceptive techniques is relatively greater than it is among low-density populations. This is in part the result of the mass media. Furthermore, the availability of contraceptives is greater for Paramaribo and its suburbs than in the rural areas. This is true not only because of relatively greater access, but because the income of city dwellers is greater than that of the rest of the population, and allows the acquisition. On the grounds that urban populations are more ready and more able to control their family size, it seems reasonable to suppose that a negative correlation exists between fertility and population density. The statistics will demonstrate the degree to which these assumptions are verified.

Analogous reasoning leads us to believe that a low degree of industrialization is associated with high fertility. Insofar as the spread of industrialization is uneven in this country, we can assume that the percentage of the labor force which is engaged in agriculture correlates positively with fertility.

Some Caribbean countries such as Jamaica show that women living in common-law relations have a lower fertility than those who are married (see section 2.2.1.). This phenomenon supposedly results from the somewhat lower frequency of sexual relations which results from temporary separations between the man and the woman. Surinam offers similar differences in fertility. The question is, to what degree will these differences be exposed by statistical analysis.

Insofar as the variable "15-44 year-old women who have a grammar school education or less" is concerned, we note that many Creole women belong to that category, and so do most of the Hindustani and Javanese women in that age bracket. Most of these women are in lower income groups. These groups generally do not have the economic wherewithal to buy contraceptives. We may thus assume that birth control will occur less often in this category than among people in the higher income brackets. This variable should also correlate positively with fertility.

The factor of "women aged 15-44 who speak Dutch as their primary language" should have the opposite effect on fertility, because such persons belong to the highest income groups. This is true for some of the Creoles, a minority of the Hindustani and Javanese, and almost all "Hollanders". Because of their better financial position, the members of these groups are able to afford the various means to limit their families. This control is seen as a necessary prerequisite to the realization of their aspirations for the raising of their children.

Section 2.2. showed that the high fertility of the Hindustani was in part a function of Hindu socio-religious organization. This influence is less pronounced for Christianity (the Creoles) and Islam (the Javanese) in Surinam, as described earlier. The connection between Hinduism and fertility which was noted in § 2.2.2. will be tested against the results of the statistical analysis.

The fact that the ethnic and religious variables correlate strongly is self-evident: the Creoles are predominantly Christians, the majority of the Hindustani are Hindu, and just about all the Javanese are Mohammedans. It is thus to be expected that the ethnic and religious variables will give almost identical correlations with the other variables.

§ 2.3.3. RESEARCH METHODS

Through the use of a correlation-matrix and of component-analysis the relationships among the twelve explanatory variables will be investigated. Then regression analysis will determine what percentage of the variation in fertility among the 138 census tracts can be explained by the combined effect of the 12 variables. Finally, the relative contribution of each variable on the dimunition of the variation in the birth rate will be computed. This will in effect be a test of the expected relations between fertility and the aforementioned variables, and simultaneously the results of the statistical analysis will bolster the results of the historical analysis described in § 2.2.

§ 2.3.4. TECHNIQUES OF DATA COLLECTION AND THE NATURE OF THE DATA

The data necessary for the computation of the fertility index of the various census tracts for 1964 are: the number of women aged 15-44, and the number of births per census tract. For the number of women, the information for each census tract is derived from the 1964 census. The material on births was collected from the identity cards in the population register. These note the births per District, but not per census tract. However, the addresses associated with the birth information made it possible to determine the tract to which each birth belonged.

The population density for each tract is expressed in the number of inhabitants per km^2. This information is extracted from the Third Census, as is that dealing with the occupations of industrial workers. Since these data do not indicate census tract, it was necessary to ascertain that information as part of the research.

The number of women living in common-law status was derived from the census material. These data are specific for each tract.

The information on religious and ethnic affiliation was calculated on the basis of the census data, as was that on women aged 15-44 with up to grammar school education, and those whose primary language was Dutch.

The number of population units in some census areas is so small that it is not defensible to apply statistical manipulations to them, or to draw conclusions. In order to solve this problem, two or more of the small census tracts are combined to provide the minimal number of units — 100 women aged 15-44. According to Derksen (1963: 45) it is not necessary to combine only areas which are contiguous. Nevertheless, for practical reasons an effort was made to combine only bordering census

tracts. In this fashion the number of tracts was reduced from the original 255 to 138. (For the manner of combination of the census tracts, see Appendix IV.). It may be reemphasized that here, as in the other chapters, the statistics are based on the *total* population of Surinam (exclusive of Bush Negroes and Indians). The numbers thus refer not to a sample but to the actual universe. The 138 census tracts therefore comprise the actual population of Surinam in 1964. The noted exceptions, Bush Negroes and Indians, are omitted from the research for reasons enumerated in § 1.1., and because the territory they occupy is not divided into census tracts.

§ 2.3.5. RESULTS

Some of the attributes of the 138 census tracts are represented in Table 32. The Standard Deviation mentioned in that table (and its square: the Variance) is a measure of the variation among the attributes. Another such measure is the difference between the first and third quartiles of the distribution. The measurability of the effect of a given attribute upon fertility increases as the variation of that attribute. Therefore the factor "common-law unions", although it is important, shows little effect here because of its low variation.

§ 2.3.5.1. THE RELATIONSHIP AMONG THE EXPLANATORY VARIABLES

If we acknowledge only those correlation coefficients with an absolute value of at least 0.70, then the following relationships may be ascertained from the correlation matrix in Table 33:

a. "agriculture" correlates negatively with "Dutch as primary language", with "Roman Catholic", and with "Creole", (and more weakly negative with "Protestant").
b. "common-law" is not clearly associated with anything else. Neither is "grammar school".
c. "Dutch as primary language" correlates positively with "Roman Catholic", "Protestant", and "Creole".
d. "Hindu" varies positively with "Hindustani".
e. "Mohammedan" correlates positively with "Javanese".
f. "Protestant" varies positively with "Creole".

It must be noted that within the religion group and within the ethnicity/descent groups the correlation coefficients already tend towards negative values because the sum of the percentages (including the remainder group) is 100. It appears that ethnic attributes and those of

TABLE 32

Mean, Standard Deviation and Other Measures of the Distribution of the Attributes (The Figures Refer to Census Tracts, Not to Persons)

Explanatory Variables	Lowest Values	1st Quartile	Median	3rd Quartile	Highest Values	Mean	S.D.
1. Population Density/Km²	0.004	0.53	2.38	62.11	797.06	38.05	84.82
2. Agrarian Labor Force	0.1	2.1	35.1	71.3	96.2	38.20	32.84
3. Common-Law Unions	0.7	2.9	4.1	6.2	80.0	5.19	6.95
4. Women aged 15-44 with Grammar School or Less education	35.7	58.3	69.6	91.1	100.0	71.11	17.85
5. Women aged 15-44 who Speak Dutch as their Primary Language	0.0	4.2	13.2	48.7	87.7	25.97	25.36
6. Hindu *	0.0	11.4	23.7	58.2	95.1	33.68	27.23
7. Roman Catholic *	0.0	3.5	10.2	29.9	79.3	16.50	14.67
8. Mohammedan *	0.0	9.2	19.7	41.7	94.9	27.21	22.81
9. Protestant *	0.0	3.0	9.1	29.9	68.3	16.67	15.78
10. Creole **	0.0	4.4	17.9	54.4	94.4	29.77	27.88
11. Hindustani **	0.4	17.1	35.0	67.6	99.8	42.10	29.46
12. Javanese **	0.0	3.0	12.7	33.3	97.3	22.42	24.33
Fertility (Number of births per 100 women aged 15-44)	5.12	17.69	22.37	29.55	66.31	24.03	10.05
* Other Religions	0.0	1.5	3.4	6.7	66.1	5.95	
** Other Ethnic Groups	0.0	1.3	3.3	7.2	59.1	5.71	

TABLE 33

Correlation Matrix ($\times$ 100)

Attribute	Number												
Fertility	13	100											
Population Density	1	—25	100										
Agriculture	2	19	—48	100									
Common-Law	3	04	01	02	100								
Grammar School	4	16	—34	62	09	100							
Dutch Primary	5	—30	57	—78	02	—59	100						
Hindu	6	24	—34	60	—06	26	—57	100					
Roman Catholic	7	—25	46	—73	12	—49	80	—65	100				
Mohammedan	8	04	—26	33	—11	37	—50	—21	—50	100			
Protestant	9	—22	46	—66	09	—43	80	—64	76	—48	100		
Creole	10	—20	45	—75	14	—47	82	—65	89	—57	86	100	
Hindustani	11	26	—32	55	—09	26	—56	98	—64	—18	—64	—65	100
Javanese	12	—01	—25	33	—01	35	—44	—30	—41	96	—38	—48	—32	100
		13	1	2	3	4	5	6	7	8	9	10	11	12

TABLE 34

Eigenvectors (of unit length) for Large Eigenvalues (λ) of the Correlation Matrix of the Explanatory Variables

Attribute	$\lambda = 6.22$	$\lambda = 2.48$	Attribute	$\lambda = 6.22$	$\lambda = 2.48$
1	+0.24	—0.02	7	+0.37	+0.00
2	—0.34	—0.03	8	—0.21	+0.52
3	+0.04	—0.02	9	+0.36	+0.01
4	—0.25	+0.11	10	+0.38	—0.02
5	+0.37	—0.04	11	—0.27	—0.45
6	—0.28	—0.45	12	—0.17	+0.56

religion correlate very strongly: within the religion category, "Roman Catholic" and "Protestant" correlate positively and strongly, and have approximately equal correlation coefficients with the other attributes. They may thus be combined.

On this basis, the most economic way to explain fertility is through the attributes 1, 2, 4, 5, 6, 7 + 9, 8, and "Other Religions".

Table 34 represents the two major eigenvalues and the associated eigenvectors of the correlation matrix. Since the sum of the eigenvalues of the 12 × 12 matrix is 12, the first two new characteristics corresponding to the reported eigenvectors account for 72.5 % $\left(\frac{6.22 + 2.48}{12}\right)$ of the total variance among the 12 attributes. (The third and fourth largest eigenvalues are respectively 1.12 and 0.70). The second eigenvector indicates the contrast between "Mohammedan, Javanese" on the one hand, and "Hindu, Hindustani" on the other. (The correlation between the first set of attributes is + 0.96, that of the second set is + 0.98). The first eigenvector contrasts "agriculture, grammar school, Hindu" with "Dutch as primary language, Roman Catholic, Protestant, Creole". (In the correlation matrix, the high positive correlation between Catholic and Protestant is noteworthy: r = + 0.76). The reduction of the number of explanatory variables which was suggested in Table 33 is supported in Table 34.

§ 2.3.5.2. EXPLANATION OF THE FERTILITY DATA FROM THE OTHER DATA

An explanation of the differences in fertility with the help of regression

analysis on the basis of the other 12 variables, gives a good estimate of the unexplained variance. However, it affords little insight into which of the variables are important, since there occur some almost linear dependencies among the 12 explanatory variables (such as Hindu-Hindustani, and Mohammedan-Javanese). The estimate of the square of the multiple correlation coefficient (R^2) = 0.153. This indicates significant contributions of the explanatory variables. The estimate of the residual-standard deviation is 9.68 (births/100 fertile women). Without this explanatory variable the estimated standard deviation in fertility is 10.05. Its reduction on the basis of the explanatory variables, although significant, is nevertheless very minor.

If the order of presentation of the explanatory variables, 1-12, is maintained, regression analysis produces Table 35, which may be interpreted as follows:

TABLE 35

Results of a Regression Analysis of Twelve Explanatory Variables

Explanatory Variables	R^2	Increase in R^2	Degrees of Freedom	Quotient	F
1— 5	0.1067	0.1067	5	0.02134	3.14 **
1— 9	0.1302	0.0235	4	0.00588	0.86
1—12	0.1530	0.0228	3	0.00760	1.12
Unexplained		0.8470	125	0.00678	

The addition of the ethnic attributes to the other attributes does not result in a clearly superior explanation of the fertility factor. Addition of the religious attributes to the attributes numbered 1-5 also fails to improve the explanation. Attributes 1-5 (and/or their associated attributes) do lead to a noticeable contribution to the explanation. In this analysis, the relatively largest regression coefficients are found in "population density" and "Dutch as primary language". Backward elimination results in the discovery of "Dutch as primary language" as the crucial variable.

For purposes of interpretation of these estimated regression coefficients, it is useful to recall the fact that each individual in a census tract can have but *one* of the attributes 6-9 (religion) and 10-12 (origin-

ethnicity), and furthermore that no more or less than one of the attributes of religion and ethnicity can be extended with a remainder group (respectively: not-Hindu, not-Catholic, not-Mohammedan, not-Protestant; and not-Creole, not-Hindustani, not-Javanese). For the theory and interpretation of regression analysis in such situations, see Kooy and Keuls (1967: Appendix).

TABLE 36

Regression Coefficients after Elimination of the Less Interesting Explanatory Variables

Variable	Estimated Regression-Coefficient	t-Value
1	-0.014×10^{-3}	—1.15
2	—0.054	—1.19
4	0.020	0.33
5	—0.144	—1.93
6	0.030	0.10
7+9	0.002	0.01
8	—0.044	—0.15
Other Religions	0.016	0.05

The elimination of some attributes which fail to improve the explanation because of their association with others, or because they do not present enough variation ("common-law union"), leads to the regression analysis summed up in Table 36. This shows that the religious attributes, as final explanatory variables, make no contribution; that "Dutch as primary language" correlates negatively with fertility ($t_{130} = -1.93$); that a high population density tends to be associated with low fertility ($t_{130} = -1.15$); and agriculture with high fertility ($t_{130} = +1.19$). The residual standard deviation is estimated at 9.66 (births/100 women per year).

The foregoing makes it clear that only a very small percentage of the total variation in fertility has been explained, to wit, about 16 %. It is thus possible that factors not considered in this analysis help determine the variation in fertility. This research was restricted to factors on which information was available.

That the explained portion of the variation is so small, may be a

function of the nature of the material (accuracy, precision). This may have reduced the explained sector.

The following remarks on the relative importance of each of the explanatory variables to fertility are in order. Population density correlates negatively with fertility. This is in complete agreement with expectations about the relationship between these two phenomena ($t_{130} = -1.15$). Also in accordance with expectations, the percentage of the labor force engaged in agriculture varies positively with fertility ($t_{130} = 1.19$).

The variable "percentage of women living in common-law or in visiting unions" was expected to correlate negatively with fertility. It was assumed that not only the extremely instable "visiting relations" but also common-law would depress fertility, in comparison with the fertility-promoting influence of legal marriage. This expectation was not borne out. This may mean that in Surinam the common-law union is less instable than is generally supposed, and that it is the visiting relationship which has a negative influence on reproduction. An indicator of this is the difference in fertility among the three forms of union given in Table 27, which points out that the average number of live-born children among mothers aged 45 or older is highest for married women and lowest for those engaged in visiting relationships. It also appears that the differences in these ratios are less between marriage and common-law than between common-law and visiting relations. This is what our statistics independently discovered. It must be noted, however, that the variation in the common-law factor is small, and that it is therefore difficult to employ it as an explanatory variable.

A positive regression coefficient was expected for the link between the "percentage women aged 15-44 with grammar school education or less" and fertility. In fact a positive relationship was attested, but it was so minor as to be not significant ($t_{130} = 0.33$).

"Dutch as primary language" fulfilled expectations, correlating with fertility both negatively and significantly ($t_{130} = -1.93$). This was almost unavoidable: Dutch is the language of the higher income groups. For reasons outlined earlier, these groups include more people who practice birth control than the lower income categories. It is not the language, but a socio-economic factor which is at work here. Hinduism correlates positively and Christianity negatively with fertility, in accordance with our expectations about religious factors. However, these connections were proven to be not significant. This means that there is no support for the hypotheses about Hinduism's meaning for repro-

duction. The possibility has not been eliminated, however, that the nature of the material used in the analysis affected the absolute value and sign of the correlation, as well as the interrelations of the explanatory variables. This possibility will be discussed later.

The analysis implies that Dutch as primary language, agriculture, and population density, constitute the three "strongest" explanatory variables. And since Dutch is the major language for the higher income groups in Surinam, this supports the view that the influence of socio-economic factors (especially urbanization and agrarian labor force) upon fertility is greater than the relative contributions of ethnic and religious variables. This conclusion constitutes an amplification of the results achieved by the historical analysis of the development of the birth rate in the 'Sixties (see Chapter 2). There it was demonstrated that the decline in the birth rate after 1962 was probably related to the increased use of contraceptives. It was suggested that this relationship in turn depended upon increased urbanization and the decline of the agrarian sector. And since both urbanization and the decline in the agrarian labor force help explain the variation in fertility, it may be maintained that the results of the two methods support each other.

TABLE 37

Regression Analysis of Socio-Economic (S), Ethnic (E), and Religious (R) Variables

Explanatory Variables	R^2	Increase	Degrees of Freedom	Quotient	F
S	0.1067	0.1067	5	.02134	3.14 *
S + R	0.1302	0.0235	4	.00588	0.86
S + R + E	0.1530	0.0228	3	.00760	1.12
E	0.0943	0.0943	3	.03143	4.63 *
E + S	0.1456	0.0513	5	.01026	1.51
E + S + R	0.1530	0.0074	4	.00185	0.27
R	0.0752	0.0752	4	.01880	2.77 *
R + E	0.1063	0.0311	3	.01037	1.53
R + E + S	0.1530	0.0467	5	.00934	1.38
Unexplained		0.8470	125	.00678	

Unfortunately it was not possible to test the hypotheses about the relative contributions of the socio-economic variables and the other factors.

In the accompanying overview, Table 37, the socio-economic variables 1-5 (see Table 32) are indicated by the letter S. The religious variables 6-9 are indicated with the letter R, and the ethnic variables 10-12 with the letter E. The regression analysis shows that:

1. Each of the group characteristics, provided it is treated separately, makes an obvious contribution to the explanation of the fertility differentials.
2. None of the group characteristics, provided they are added last, makes an obvious contribution to the explanation of the fertility differentials.

This demonstrates once again the strong linear relationship of the variables in different groups. The ethnic variables (E; three data) already explain 9.4 %; little can be added after that. Because of the interdependence of the variables it was impossible to determine which was the most explanatory.

CHAPTER III

THE DEVELOPMENT OF MORTALITY

§ 3.1. THE DEVELOPMENT OF MORTALITY FROM 1922 TO 1970

This section will discuss the changes in the death rates between 1922 and 1970, investigate the major causes of death, and measure their contribution to the evolution of mortality. The next section will describe mortality by ethnic group.

The basis for the 1922-1950 computations, here as with the fertility rates, is the size of the population as it was published in the *Surinaams Verslag* and the Second General Population Census of 1950. A correction is added to these data which is analogous to that used to arrive at an accurate rate for fertility, as noted in section § 2.1.

Population figures from 1951 to 1963 are based on the combined results of the Second Census and my own statistical materials on birth and death. Migration for this period has been ignored, for the reasons enumerated in § 1.4.3., and those explained in § 2.1.

For the population figures between 1964 and 1970, the sources were the Third Census of 1964, the death notices of the Ministry of Public Health, and self-collected birth- and migration figures.

Surinam's death rate declined from 24.4 per 1000 to 7.4 per 1000 between 1923 and 1970. If we maintain the division of this era into the three phases which the chapter on fertility introduced, then it appears that the reduction in mortality was somewhat steeper in the last phase (1962-1970) than in the preceding periods. The decline in this first phase (1923-1943) amounted to 8 points, that of the second phase (1943-1962) was 8 points, and the last phase amounted to 1.4 points.

Countries whose socio-economic structure is roughly similar to that of Surinam, that is, Guyana and Trinidad, evidence an analogous declining trend in their death rates. For Guyana this is shown by the figures published in the "Demographic Yearbook" and for Trinidad in data derived from the Central Statistical Office (1956; 1969). Guyana's mortality decreased from 28.5 per 1000 in 1923 to 7.6 per 1000 in 1968. The figures for Trinidad were 20.8 and 7.0.

TABLE 38

Surinam Mortality in Numbers, and per 1000 Inhabitants of Surinam, Guyana, and Trinidad, 1923-1970

Year	Surinam		Guyana	Trinidad
	Number	per 1000	per 1000	per 1000
1923	2314	24.4		20.8
1924	1906	19.5		20.0
1925	1772	17.5		20.3
1926	2223	21.3	28.5	21.9
1927	2107	19.6		18.7
1928	1925	17.4		19.8
1929	2032	17.9	25.6	19.4
1930	1855	16.0	23.2	18.9
1931	1966	16.6	22.0	19.9
1932	1827	15.1	21.2	17.0
1933	1853	15.0	24.6	19.5
1934	1835	14.5	24.8	18.5
1935	1734	13.5	20.8	17.4
1936	1916	14.6	20.6	16.3
1937	1854	13.9	22.1	17.4
1938	1916	14.2	25.8	15.8
1939	1876	13.6	19.8	16.0
1940	2036	14.4	18.6	15.7
1941	1928	13.4	15.8	16.0
1942	2148	14.6	17.5	17.6
1943	2480	16.6	24.8	16.5
1944	2467	16.2	22.1	14.9
1945	1965	12.6	17.9	14.4
1946	2026	12.7	15.6	13.7
1947	2338	14.3	14.6	13.4
1948	2217	13.2	14.2	12.2
1949	2243	13.1	13.3	12.2
1950	2038	11.6	14.6	12.1
1951	1946	10.7	13.5	12.0
1952	1948	10.4	13.5	12.1
1953	2110	10.9	13.3	10.7
1954	1910	9.5	12.4	9.8
1955	1967	9.4	11.9	10.4
1956	2006	9.2	11.2	9.6

Year	Surinam		Guyana	Trinidad
	Number	per 1000	per 1000	per 1000
1957	2201	9.8	11.6	9.5
1958	1906	8.1	10.2	9.2
1959	2128	8.7	10.0	9.1
1960	2133	8.4	9.5	7.9
1961	2310	8.1	9.2	7.9
1962	2412	8.8	8.1	7.1
1963	2406	8.4	7.8	7.2
1964	2292	7.7	7.9	7.0
1965	2378	7.7	9.0	6.9
1966	2274	7.2	8.3	7.1
1967	2513	7.7	8.2	6.7
1968	2435	7.2	7.6	7.0
1969	2477	7.2		
1970	2583	7.4		
1971 *	2640	7.4		

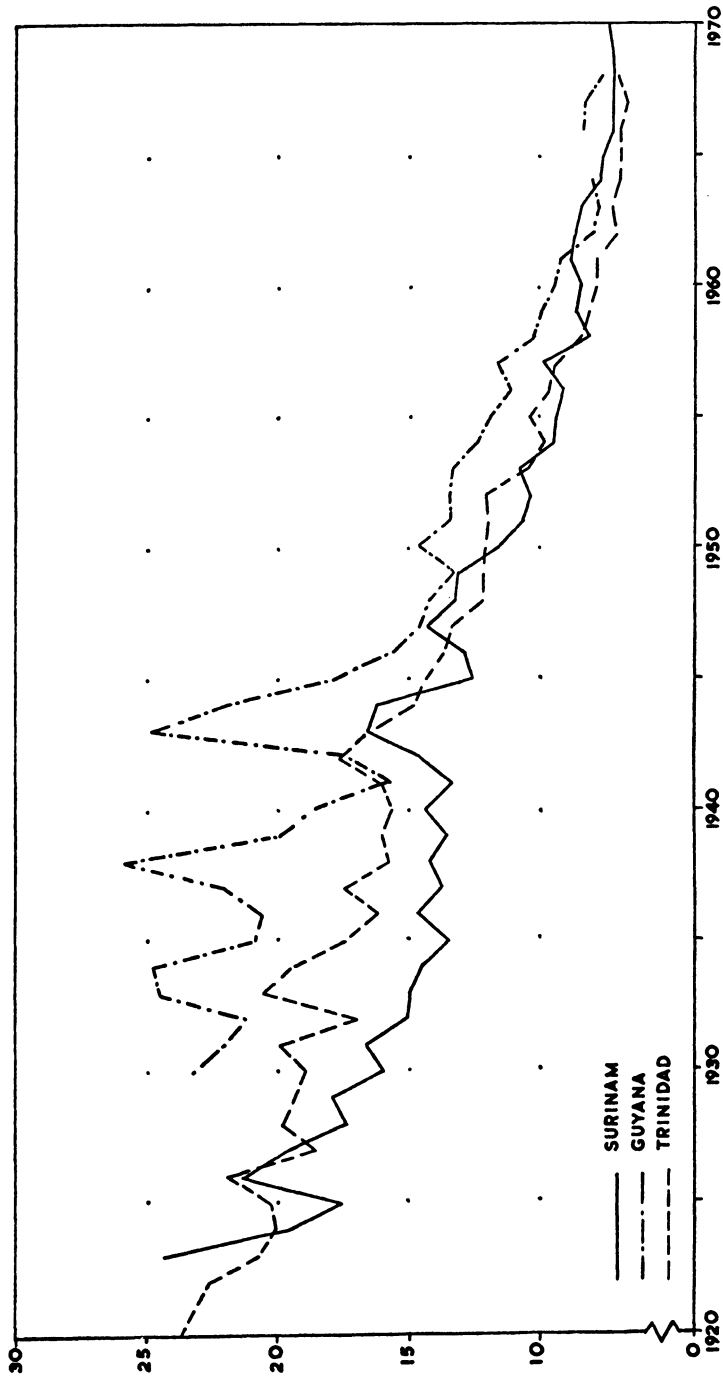
* Provisional figure.

The trend noted in these three countries, one in which a decline in the death rate precedes the decline in fertility (which began after 1960), agrees with the processes of demographic transition as these occurred in Western societies (Godefroy 1962: 12; Hall 1972: 214). In the developed countries the decline in mortality is followed, after about one generation, by a reduction in the birth rate. It must be noted that the birth rate remained fairly constant during this intervening generation (United Nations 1971: 13). This latter observation does not apply to the Caribbean countries. As shown in Tables 12, 38 and 58, as well as in Figure 12, the lowering of death rates in 1960 was followed by a decrease in birth rates. During these four decades of mortality decline, the birth rates remained steady from 1920 until 1940, and rose from there until 1960, causing an enormous population growth. Roberts (1961: 24-26) compared the population increase of Jamaica with the process of demographic transition, and noted differences and similarities in comparison with Western countries. These differences are analogous to those observed for Surinam which, unlike the Western countries, showed a strong increase of the birth rate before its decline.

The following subsections will investigate the dominant causes of death, and the degree to which these contributed to the lowering of the

Figure 8

DEATH RATES IN SURINAM, GUYANA, AND TRINIDAD, 1920–1970



death rate between 1922 and 1970. Since information on the causes of death have been systematically and quantitatively collected only since 1958, the analysis of this subject perforce will bear a summary character. The definition of the concept "cause of death" as it is used by the Surinam medical statistics, and therefore as it is used here, is the standard international classification (United Nations 1955: 223).

Only those causes will be discussed which had an important role in the decline of mortality. One exception is to be noted: although the category "old age and poorly described causes of death" contains a large number of cases and should therefore be considered in the research, it will not be discussed because the various diseases belonging to this category are unknown. The large number of unknown causes of death is probably related to the shortage of medical facilities, especially in the agrarian sectors.

As an introduction to the analysis of mortality by causes of death, a number of statistics on death will be given for three characteristic years.

Finally, it must be noted that the five causes of death which will be discussed, together account for only 25 % of all the cases of death per year. This seems minor, but definitely is not. As mentioned above, about 25 % of all deaths are due to old age and poorly described causes. In other words, the remaining 50 % refers to a very large number of death causes. This large number implies that the contribution of each of these causes is quite small, which is why the diseases involved in the 50 % remainder will not be discussed here.

The order of presentation of the five causes is based on the international classification of causes of death. This means that the most important category, infectious and parasitic diseases, will be treated last.

§ 3.1.1. PNEUMONIA

A. *The 1922-1943 period*

As Figure 8 indicates, the crude death rate fell 7.8 points between 1923 and 1943, from 24.4 to 16.6 per 1000. Since in fact the causes of death during this era are available only for the years 1931 and 1942, the contribution to mortality of individual diseases can only be sketched. This same limitation holds for the other causes to be discussed later.

In 1931, pneumonia was one of the most important causes of death. Of the 1966 deaths reported, 107 were so classified. By 1942, this number had increased to 124 (van der Kuyp *et al.*, 1959: 108), and the disease was still an important factor in mortality. In 1931, pneumonia accounted

TABLE 39

An Overview of Mortality and Causes of Death in Three Selected Years

Year	Mortality			Causes of Death					
	Total Deaths	Infant Deaths	Other Deaths	Pneumonia	Congenital and Infant	Malignant Tumors	Gastro-Intestinal	Infectious-Parasitic	Other
1942	2148	—	—	124	80	70	56	227	1591
1961	2310	554	1756	97	264	140	59	76	1674
1968	2435	482	1953	81	173	138	76	92	1875

TABLE 40

Mortality by Cause of Death, in Absolute Numbers and Percentages of the Total Number of Deaths, 1931-1970

	Pneumonia		Congenital and Infant		Malignant Tumors		Gastro-Intestinal		Infectious-Parasitic		Totals *	
Year	#	%	#	%	#	%	#	%	#	%	#	%
1931	107	5.4	101	5.1	54	2.7	37	1.8	215	10.9	1966	100
1942	124	5.7	80	3.7	70	3.2	56	2.6	227	10.5	2148	100
1958	53	2.6	133	6.6	103	5.1	26	1.3	82	4.1	1989 **	100
1959	106	4.8	206	9.4	133	6.1	45	2.0	78	3.5	2177 **	100
1960	85	3.8	192	8.7	124	5.6	48	2.1	85	3.8	2200 **	100
1961	97	4.1	264	11.4	140	6.0	59	2.5	76	3.2	2310	100
1962	142	5.8	255	10.5	137	5.6	100	4.1	90	3.7	2412	100
1963	113	4.6	225	9.3	136	5.6	76	3.1	77	3.2	2406	100
1964	88	3.8	244	10.6	150	6.5	85	3.7	84	3.6	2292	100
1965	77	3.2	172	7.2	135	5.6	71	2.9	61	2.5	2378	100
1966	82	3.6	152	6.6	138	6.0	63	2.7	66	2.9	2274	100
1967	101	4.0	221	8.7	160	6.3	88	3.5	77	3.0	2513	100
1968	81	3.3	173	7.1	138	5.6	76	3.1	92	3.7	2435	100
1969	75	3.0	114	4.6	103	4.1	57	2.3	36	1.4	2477	100
1970	104	4.0	116	4.4	183	7.0	83	3.2	72	2.7	2583	100

* Totals include other disease categories not mentioned in this table.

** Minor difference from actual totals may be ignored. See text.

for 5.4 % of all deaths, in 1942 for 5.7 %. When the death rate is computed, it appears to remain fairly stable for this factor: at about 85 per 100,000. This means that pneumonia was not involved in the decline of the general death rate during this decade.

B. *The 1943-1962 period*

For this period, only the years from 1958 through 1962 have information on cause of death. The data for 1953, 1956 and 1957 are not usable for this research because they employed a different system of classification. For 1958-1960, differences were discovered between the total number of deaths as this is used in the text, and the number reported by the Ministry of Public Health. The text figures for 1958 are 83 lower than those of the Ministry, a difference in death rate of 0.04 %. For 1959, the text is 49 lower, for a difference of 0.02 %. In 1960, however, the text is 67 (0.03 %) higher. These discrepancies are small enough to be safely ignored. Only for the computation of the number of deaths per cause have the numbers of the Ministry of Public Health been maintained, since only this source controls the data on death causes, and since

TABLE 41

Death Rate per 100,000 Population, by Cause of Death, 1931-1970

Year	Pneumonia	Congenital and Infant	Malignant Tumors	Gastro-Intestinal	Infectious-Parasitic	Total
1931	90.8	85.7	45.8	31.4	182.5	1669.4
1942	84.6	54.6	47.7	38.2	155.0	1466.7
1958	22.7	57.1	44.2	11.1	35.2	819.2
1959	43.7	85.0	54.9	18.5	32.2	878.7
1960	33.7	76.2	49.2	19.0	33.7	847.1
1961	37.0	100.8	53.4	22.5	29.0	882.6
1962	52.1	93.6	50.3	36.7	33.0	885.7
1963	39.8	79.3	47.9	26.8	27.1	848.6
1964	29.8	82.7	50.8	28.8	28.4	777.3
1965	25.2	56.3	44.1	23.2	19.9	778.3
1966	25.9	48.1	43.7	19.9	20.9	720.4
1967	31.0	67.9	49.1	27.0	23.6	770.0 *
1968	24.2	51.8	41.3	22.7	27.5	720.0 *
1969	21.9	33.4	30.1	16.7	10.5	720.0 *
1970	29.9	33.4	52.7	23.9	20.7	740.0 *

* Totals rounded off.

correction of its "error" would have been extremely time-consuming.

In the 1958-1962 period, pneumonia remained important. The number of deaths it caused rose from 53 in 1958 to 142 in 1962, which is equivalent to 2.6 % and 5.8 % for those years. The death rate caused by pneumonia increased from 22.7 per 100,000 to 52.1 per 100,000. Pneumonia can thus be shown to have had a negative influence on the decline of the general death rate during these years. Expressed in percentages, this influence amounts to 44.2, computed as follows:

$$\frac{\text{pneumonia death rate in 1962} - \text{pneumonia death rate in 1958}}{\text{general death rate in 1962} - \text{general death rate in 1958}} \times 100.$$

It must be noted also that the death rate only barely declined during these years. However, if the entire period 1943-1962 is considered, then the death rate did drop sharply. But data on causes of death are not available for the period.

C. *The 1962-1970 period*

In the 'Sixties, the death rate due to pneumonia declined again, albeit to a very slight degree. In general we may say that the mortality of this disease has shown a general downward trend, with minor reversals in 1967 and 1970. In 1962 and 1970, respectively 142 and 104 deaths were counted in this category, which translates into 5.8 % and 4 %. Insofar as the number of deaths per 100,000 persons is concerned, the decline went from 52.1 to 29.9, forcing the overall death rate down by 15.8 %.

§ 3.1.2. CONGENITAL MALFORMATIONS AND DISEASES OF THE NEWBORN

A. *The 1922-1943 period*

Between 1931 and 1942 the number of deaths in this category fell from 101 to 80. In percentages of the total deaths this was a decline from 5.1 to 3.7 %. It must be pointed out that, partly because of the use of different international classifications of causes of death, both the numbers and the percentages are lower than the true figures of death due to these causes (van der Kuyp *et al.* 1959: 108). Between 1931 and 1942 the number of deaths in this category declined from 85.7 to 54.6 per 100,000 population, contributing 15.3 % to the decline in the general death rate, which between 1931 and 1942 amounted to 202.7 points.

B. *The 1943-1962 period*

A clearcut rise is discernible in this period, both in the absolute number of deaths (from 133 in 1958 to 255 in 1962) and the contribution to the general death rate from 6.6 % to 10.5 %. This increase is also obvious in the death rate for this category, which rose from 57.1 to 93.6 per 100,000, and so accounts for 54.8 % of the change in the overall death rate between 1958 and 1962.

C. *The 1962-1970 period*

As was the case with pneumonia, mortality due to genetic abnormalities declined in this period. In absolute numbers it fell from 255 to 116, in percentages from 10.5 to 4.4 while the death rate was lowered from 93.6 to 33.4 per 100,000 inhabitants. This accounts for 42.9 % of the decline in the general death rate. This change in fatal congenital disorders is closely related to the great improvement in preventive care for pregnant women and infants.

§ 3.1.3. MALIGNANT TUMORS

In manipulating these data, it must be borne in mind that after 1950 major improvements were made in diagnostic facilities. This means that before that time, the chance of under-registration or incorrect registration was always present.

A. *The 1922-1943 period*

The number of cases of death in this period rose from 54 in 1931 to 70 in 1942, that is, from 2.7 % to 3.2. % of all the deaths in these years. When the death rate is used as the yardstick for the development of this cause of death, there appears to be very little increase in this disease. It amounts to but 0.9 % of the total change in the death rate for this period.

B. *The 1943-1962 period*

Again there is very little increase in the total cases of death due to this disease category. This is also true for its percentage of the total death rate. Between 1958 and 1962, the death rate in this area remained approximately constant.

C. *The 1962-1970 period*

After 1962, the number of deaths resulting from this category did not increase further. Only on 1964 and 1970 did the absolute numbers

exceed those of 1962. Throughout this period, the average remained about 136, which means that the percentage for 1970 was higher than for 1962. The rate of deaths from this category also remained fairly constant at about 50 per 100,000 inhabitants.

§ 3.1.4. GASTROINTESTINAL DISORDERS

A. *The 1922-1943 period*

The development of mortality resulting from gastritis is not impressive in this period: the incidence in absolute and relative terms was minor, and the percentages did not change much between 1931 and 1942. Nor did the death rate due to this category vary appreciably: it was 31.4 per 100,000 in 1931, and 38.2 in 1942.

B. *The 1943-1962 period*

In 1958, the number of deaths due to gastrointestinal disorders fell to 26. This implies that less than 2 % of all the cases of death can be traced to this class. For 1962, the figures were 100 cases, which is 4.1 % of the total. The death rate also increased, to 36.7 per 100,000 inhabitants. This increase of 25.6 points resulted in a negative influence on the light but general decline of the death rate in the years 1958-1962. As noted earlier, it must not be assumed that deaths remained close to stable for the entire period. On the contrary, there was a significant lowering of mortality between 1943 and 1958. Again, however, there are no data on this cause of death for the period 1943-1958.

C. *The 1962-1970 period*

As did most causes of death, this category underwent an obvious reduction in the year 1962. Between then and 1970, the number of deaths declined from 100 to 83, and the death rate from 36.7 to 23.9 per 100,000. This decrease accounts for 9.1 % of the drop in the general death rate in this period.

§ 3.1.5. INFECTIOUS AND PARASITIC DISEASES

This catgory includes such diseases as tuberculosis, syphilis, malaria, bilharzia, and filaria. These and other communicable and parasitic diseases have been strongly curtailed over the years, as the following indicates.

A. *The 1922-1943 period*

Between 1931 and 1942, the number of deaths due to these diseases increased from 215 to 227. When measured in terms of percentage of the total number of deaths, however, there is a measurable but insignificant decline from 10.9 % in 1931 to 10.5 % in 1942. Both in terms of absolute numbers of cases and in percentages of the overall death rate, it is clear that this fifth category, infectious and parasitic diseases, claimed the greatest number of victims. In 1931 the death rate for this class was 182.5 per 100,000, and in 1942 it was still 155.0, a relatively small decline. This is not surprising since the measures to combat these diseases began to be effective only after 1940.

B. *The 1943-1962 period*

Around 1958, the death rate from this category of disease decreased sharply. In that year the total number of cases was only 82, or 4.1 % of the total number of deaths. This mortality level was maintained throughout the 'Sixties. The declining importance of these diseases as mortality causes is reflected not only in the decline which began in 1958, but by the changes in the number of victims claimed, which decreased from 155.0 in 1942 to 35.2 in 1958. This reduction contributed greatly to the decline in the general death rate characterizing this period. The decreasing importance of this category is much more directly related to various improvements in public health and nutritional status than is true of the other four mortality causes. These measures involved in the main preventive care (instruction, control, and vaccination), medical treatment (better medicines), legislation, socio-economic progress, better foods, and better housing (van der Kuyp *et al.* 1959: 108-109). It should be emphasized here that the influence of these measures can be seen most clearly in the development of mortality for the period between 1943 and 1958, when the overall death rate dropped from 1660 to 819 per 100,000 inhabitants. Data on individual causes of death are missing for these decades.

C. *The 1962-1970 period*

The decline of the importance of the communicable and parasitic diseases which began in the previous period continued after 1962. The absolute numbers of deaths diminished from 90 in 1962 to 72 in 1970, while the percental portion of the total mortality declined from 3.7 to 2.7 %. There was a reduction in the death rate from 33.0 to 20.7 per 100,000 inhabitants, accounting for 8.7 % of the overall decline.

As in the previous period, this change resulted from measures to improve the public health.

To summarize: the death rate in Surinam fell quite sharply between 1923 and 1970, from 24.4 to 7.4 per 1000 inhabitants. Similar decreases have been noted in comparable Caribbean areas. If we ignore the high percentage (25 %) of cases with unknown or inadequately described causes of death, then it can be stated that in 1931 and 1942 roughly the same percentage of deaths resulted from the combined effect of the following five causes: pneumonia, congenital malformation and diseases of the newborn, malignant tumors, gastrointestinal disorders, and infectious and parasitic diseases. The latter category accounts for the greatest number of deaths. The overall death rate per 100,000 inhabitants declined during this period by 202.7 points. The five death causes listed accounted for 56.1 points, contributing 30.6 % to the reduction in the overall death rate.

In the next period, 1943-1962, the mortality caused by the five causes remained at 25 % of the total. The death rate from these causes remained about constant, as did the overall death rate. Only the last category, infectious and parasitic diseases, shows a downward trend. Its major effect on mortality took place between 1943 and 1958, but unfortunately there are no data to allow an investigation of the relative importance of the causes of death. For the years after 1958, only a very small decline can be established.

For the post-1962 period, there are some clear changes. Even in this era the combined effect of the five death causes remained at 20-25 % of the total mortality. The general decline in mortality which characterizes this period is also reflected in each of the five classifications, most notably in the reduction of deaths due to communicable and parasitic diseases. The death rate for the joint causes of death declined from 265.7 per 100,000 inhabitants in 1962 to 160.6 in 1970. This accounts for 27.8 % of the reduction in the overall mortality.

For Trinidad, the same causes of death had an important role in the general decline of mortality. An article about this country refers to "a few of the important diseases", which are then listed as malaria, tuberculosis, bronchitis, pneumonia, gastritis, diseases of the newborn, diabetes mellitus, and malignant tumors. It appears that the death rate due to pneumonia from 1944 to 1948 averaged 156.2 per 100,000 inhabitants, and in the 1955-1959 period 104.8. For gastritis, in the same periods, the numbers were 146.9 and 141.6. Here too, the reduction in

mortality was ascribed to measures in the medical and social-hygiene areas (Harewood 1967a: 75-78).

As noted earlier, in Surinam the reduction in the death rate is closely connected with measures taken just before and after the Second World War. These same measures led, in the Nineteen-Forties and Fifties, to a rise in the birth rate, as the previous chapter explained.

The foregoing discussion focused on the decline in mortality as it resulted from changes in five causes of death. The following section will investigate the development of mortality as a function of ethnicity.

§ 3.2. DIFFERENTIAL MORTALITY BY ETHNIC GROUP

The reduction which was ascertained for the general death rate also holds true for the different ethnic groups, as Table 42 and Figure 9 show. The decline is more dramatic for the Creole and Hindustani groups than for the Javanese. The illustrations also indicate that in general the death rates of Creoles and Hindustani are about equal, while with the exception of the Nineteen-Forties, the Javanese rates were much higher. A careful examination of the first two groups makes it clear that the level of mortality among the Hindustani is somewhat better than that of the Creoles. In Guyana these results are reversed: the Creoles had a lower death rate than their Hindustani compatriots, at least between 1910 and 1939 (Roberts 1948: 194-196).

It is no simple matter to ascertain the causes of differences in mortality among ethnic groups, especially when, as here, there is an absence of medico-sociological research. Nevertheless, an attempt will be made to suggest some of the factors on the basis of the existing literature. It is clear that the distinctions between the Creoles and the Hindustani are very minor. Hence, the focus will be placed upon the differences between these two groups on the one hand, and the Javanese on the other. Our search for an explanation will involve two factors: medical-mindedness and occupation-domicile.

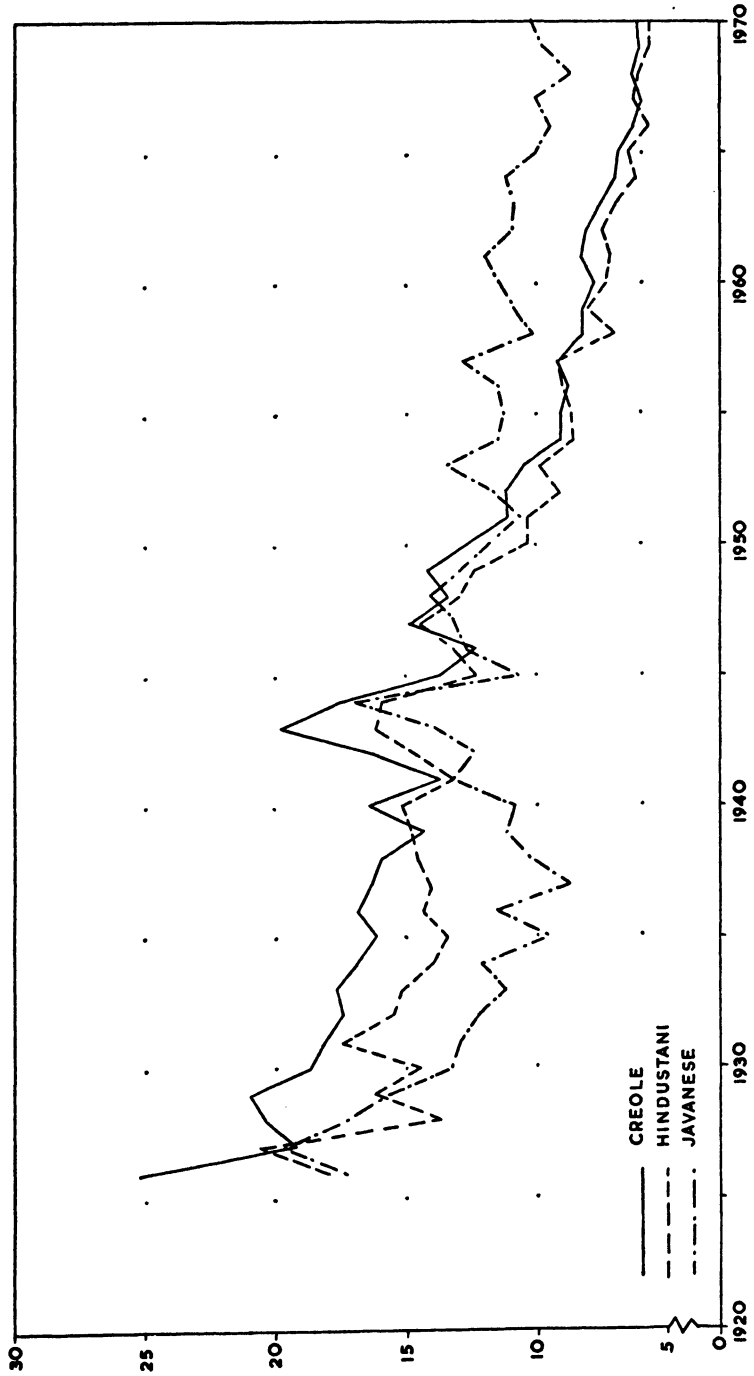
§ 3.2.1. MEDICAL-MINDEDNESS

Some doctors in Surinam are under the impression that Javanese are less prepared to avail themselves of medical help than the other groups (Ministry of Health, 1966: 21). They are likely to consult a physician only after all other measures have proven to be fruitless. As a result, the chance that a disease will have an adverse termination is higher among the Javanese than among other ethnic groups. Thus the chances of dying are higher for this group. It is possible that this low level of

TABLE 42
Mortality in Absolute Numbers and per 100,000 Inhabitants, by Ethnic Group, 1926-1970

	Number of Deaths			Number per 100,000		
Year	Creole	Hindustani	Javanese	Creole	Hindustani	Javanese
1926	1196	515	369	25.3	18.1	17.4
1927	912	599	471	19.3	20.6	19.8
1928	978	408	445	20.4	13.7	17.3
1929	1011	496	427	21.0	16.2	15.7
1930	907	454	372	18.7	14.5	13.3
1931	903	560	371	18.2	17.5	13.0
1932	882	507	360	17.5	15.5	12.3
1933	910	511	339	17.7	15.2	11.3
1934	889	484	371	16.9	14.0	12.1
1935	873	478	297	16.2	13.4	9.6
1936	932	529	359	16.9	14.4	11.6
1937	924	543	266	16.4	14.2	8.8
1938	918	582	305	16.0	14.6	10.3
1939	851	602	336	14.5	14.8	11.2
1940	980	638	339	16.5	15.2	10.9
1941	824	579	422	13.8	13.2	13.2
1942	988	665	403	16.3	14.7	12.5
1943	1180	758	454	18.9	16.2	14.0
1944	1130	787	445	17.7	16.0	17.0
1945	906	625	345	13.8	12.3	10.8
1946	840	691	403	12.4	13.1	12.7
1947	1034	798	423	15.0	14.6	13.2
1948	949	734	462	13.5	13.1	14.1
1949	1006	735	443	14.3	12.5	13.0
1950	906	650	419	12.8	10.5	11.9
1951	817	673	388	11.2	10.5	10.8
1952	852	625	431	11.3	9.3	11.8
1953	829	697	506	10.6	10.0	13.5
1954	742	638	442	9.2	8.7	11.6
1955	773	675	443	9.2	8.8	11.4
1956	774	717	462	8.9	9.0	11.6
1957	841	775	527	9.3	9.3	12.9
1958	778	623	432	8.3	7.1	10.3
1959	810	753	474	8.3	8.2	11.0
1960	801	715	517	7.9	7.5	11.6
1961	881	736	551	8.4	7.3	12.1
1962	889	793	523	8.2	7.6	11.1
1963	868	777	528	7.7	7.1	11.0
1964	823	740	551	7.1	6.4	11.3
1965	840	785	513	7.0	6.6	10.2
1966	780	735	507	6.4	5.9	9.7
1967	764	819	547	6.1	6.3	10.2
1968	820	845	490	6.5	6.3	8.9
1969	812	808	559	6.4	5.9	9.9
1970	825	830	596	6.5	5.9	10.4

Figure 9
DEATH RATES PER ETHNIC GROUP, 1920-1970



medical-mindedness among the Javanese, which is often manifested in the form of a certain reticence to engage strangers, is related to their *rukun*. This central culture element implies a striving for group cohesion and the avoidance of internal group conflicts. Group solidarity is manifested in such traits as neighborly aid (*goton rojong*), but does not extend to non-Javanese. The implication is that Javanese do not like to visit a doctor unless he is also of Javanese descent. And since there were no Javanese doctors in Surinam until 1971, it seems likely that Javanese unwillingness to consult a physician and the associated higher death rate, are functions of *rukun* and of the avoidance of non-Javanese. This may explain the general difference between Javanese mortality and that of other ethnic groups. It can not, however, explain the low death rate among Javanese in the decade 1930-1940.

It is not impossible, however, that a certain amount of under-registration of deaths has affected these figures. The population totals per ethnic group were quite small in this period. There were only about 25,000 Javanese in Surinam between 1930 and 1940. This means that even a very small under-registration of deaths would lower the mortality rate drastically. And since the Javanese immigrated later than the Hindustani and lived for a longer time outside of the administrative center of Paramaribo, a degree of under-registration too small to be significant (for the general purposes of this research) may have been the cause of the anomalously low death rate of the 'Thirties. Note also that the death rate of this group was not *much* lower than that of other groups: at its greatest difference, in 1937, the Javanese were about 5 points less than the Hindustani.

It will be useful in future medico-sociological investigations to ascertain the bonds between the norms and values of diverse ethnic and social groups, and their posture regarding medical treatment.

§ 3.2.2. OCCUPATION-DOMICILE

In seeking an explanation for the differential mortality of the Javanese on the one hand, and the two other major groups on the other, the factors of occupation and place of residence are of importance. In 1964, according to the Third Census, the Javanese were over-represented in the agrarian sector. This is clear not only from the accompanying overview (Table 43) based on the 1964 census, but from the concentration numbers which are derived for each ethnic group by relating its percentage of the agrarian labor force to that of the population at large. These numbers for the Creoles, Hindustani, and Javanese are respectively 0.2,

TABLE 43

Representation of the Three Major Ethnic Groups in the Total Population and the Agrarian Sector of Surinam in 1963

Percentage of the Total Population			Percentage of Agrarian Sector		
Creole	Hindustani	Javanese	Creole	Hindustani	Javanese
39.3	38.5	16.6	10.0	55.1	33.2

1.4, and 2.0. On their basis it may be concluded that the Javanese are ten times as strongly represented in the agrarian sector as the Creoles, and about 1.5 times as much as the Hindustani. Thus a comparatively large number of Javanese farmers is regularly brought into contact with partly flooded rice fields, the usual breeding place for bilharziasis. Furthermore, these farmers normally go about barefoot, increasing the chances of infection. (This last point is equally true for the other ethnic groups, but they are less strongly represented in this occupational sector.) Infectious and parasitic diseases occur more often among Javanese, as a comparison of the death rates due to this factor shows for the three ethnic groups. Table 44 based on the figures of the 1964 census shows that the number of such deaths per 100,000 inhabitants is twice as high for Javanese as for the other groups, at least during the two years for which statistics are available.

Aside from occupation, the factor of domicile — which is almost inseparable from occupation — plays an important role. Javanese are also over-represented in the rural districts. To give an overview of this, concentration numbers were derived for the three ethnic groups. These

TABLE 44

Deaths from Infectious and Parasitic Diseases, Absolute and per 100,000 Inhabitants, by Ethnic Group

Year	Creole	Hindu-stani	Java-nese	Total	Creole	Hindu-stani	Java-nese	Total
1965	21	15	17	2378	17.6	12.6	33.8	778.3
1966	22	18	19	2274	18.1	14.5	36.7	720.4

TABLE 45

Representation of the Three Major Ethnic Groups in the Population of Surinam and of Paramaribo in 1963

Percentage of Surinam's Population			Percentage of Paramaribo's Population		
Creole	Hindustani	Javanese	Creole	Hindustani	Javanese
39.3	38.5	16.6	61.5	23.0	7.1

turned out to be, respectively, 1.5, 0.5, and 0.4. These figures, and the numbers in Table 45 upon which they are based, show the Javanese to be under-represented in the urban population, and over-represented in the rural Districts of Surinam. Since the availability of medical facilities is lower in the rural than in the urban areas, their chance for medical attention is correspondingly lower than it is for other groups.

So far we have treated the Creoles and Hindustani as if they represented a single entity, because the difference in their mortality levels was minor. Nevertheless, there are differences, small as they may be. It has not been possible to ascertain the reasons therefor, and it probably is

TABLE 46

Stillbirths per 1000 Live Births, Paramaribo

Year	Legal	Illegitimate	Total
1920—1924	63	143	113
1925—1929	70 *	114 *	97
1930—1934	51 **	100 **	81
1935—1939	44	78	66
1940—1944	39	68	56
1945—1949	36	56	46
1950—1954	38	50	44
1955—1956	28 ***	42 ***	38

* 1925—1927.
** 1931—1934.
*** 1955.

Source: van der Kuyp *et al.* 1959: 111.

fruitless to try to explain such minuscule variations. If an explanation *must* be sought, however, it would probably lie in the different family structures of these two groups. The fact that many Creole families are characterized by matrifocality (see § 2.2.1) implies that many Creole mothers are forced to be their families' breadwinners. Another result of this family type (which is associated with a weak bond between the father and his family) is the large number of children born out of wedlock. Since the percentage of stillborn infants is very high among illegitimate children (see Table 46), it may well be that the somewhat higher death rate among Creoles is a function of their high rate of illegitimacy, when compared to the Hindustani. Unfortunately there are no data to support this hypothesis.

CHAPTER IV

THE DEVELOPMENT OF IMMIGRATION

§ 4.1. THE DEVELOPMENT OF IMMIGRATION FROM 1922 TO 1970

After the abolition of slavery and the repeal of state supervision — a decade during which the ex-slaves were obligated to work for the government as hired laborers — there existed a labor problem for the plantation owners.* The freed slaves were unwilling to remain on the plantations, for conditions there were not favorable to them (their rights and duties were spelled out in an official publication: *Gouvernementsblad no. 9,* dated April 16, 1863). Many left the plantations to settle elsewhere as small farmers, or to work in the forests as lumberjacks. Others went to Paramaribo, where they usually remained unemployed for extended periods. To ameliorate the labor problem on the plantations, an effort was begun to immigrate laborers from what was then British India. Between 1873 and 1916, 34,304 contract laborers were recruited there. Between 1890 and 1939, 32,954 laborers entered Surinam from the former Dutch East Indies. Some of the workers in these two groups, respectively 34 % and 32 %, returned to their homelands when their contract period was finished (*Koloniaal Verslag* 1870-1949; see also Ismael 1949: 94-96; de Klerk 1953: 77-78). Since the last Hindustani entered Surinam in 1916, the contract laborers from India fall outside of the parameters of this study. The Javanese migration lasted until 1939, thus, when contract laborers are mentioned in the following discussion, this term will refer exclusively to Javanese.

Even before the abolition of slavery some immigration took place, as with laborers from China and from the West Indies. However, only small numbers are involved, and generally these attempts must be interpreted as failures.

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* For arguments in favor of the abolition of slavery, based upon ethical considerations, see Hoëvell 1854 and Wolbers 1970: 776 ff. For an evaluation which maintains that the institution was abolished at least in part for economic reasons, see Williams 1944. The latter work is not primarily involved with Surinam, but with the English-speaking Caribbean.

It needs to be emphasized that this chapter is concerned only with immigration and the remigration of Surinamers. A discussion of emigration is left for Chapter 5. The social structure of Surinam is the result of immigration (see also § 1.5.2). Knowledge about the genesis of this structure will give insight into the differential emigration of the ethnic groups.

In the description of immigration, three aspects will be distinguished: sex-ratio, ethnic composition, and age-distribution. For the nature of the material and its reliability, see § 1.4.3. For comparative purposes, this section will continue to employ the phase-division of the fertility and mortality discussions.

Table 47 shows that between 1923 and 1943 an average of 1029 persons per year settled in Surinam. During this period the actual numbers of immigrants declined steadily from 1586 in 1923 to 281 in 1943. This reduction, which clearly climaxed in 1932, was the result of the cessation of immigration by contract laborers. After 1932 only one group of such laborers entered Surinam, in 1939 as the suddenly swollen figures indicate. The yearly decline in immigrants is clear not only from their actual numbers, but from the relative immigration figures: in 1923 immigration accounted for 16.7 per thousand population, in 1943 for only 1.8. For the entire period, the average yearly immigration figure was 9.2 per 1000 population.

More than half of all immigrants — at least in the decade 1923-1932 — were Javanese. Before they left Indonesia they had signed a contract to work for five years in Surinam, which could be extended by at most ten years (de Waal Malefijt 1963: 27). Most of the other immigrants were Dutch officials who were transferred to Surinam for different periods.

As was noted in section § 1.4.3, migration data are available for only a few years of the next phase, 1943-1962. For the 1944-1949 period, it may be noted that the decline which began in 1932 continued for two years after 1943. Beginning with 1946, the number of immigrants began to increase again. For this short period, the average immigration per year was 601, which then accounted for 3.6 per 1000 inhabitants. Immigration thus was less important than in the previous phase. Most of the immigrants probably came from the Netherlands. Between 1946 and 1956, the number of people entering from there was 7421 (van der Kuyp *et al.* 1959: 154).

In the post-1962 period, immigration increased. In 1964 there were 1202 newcomers, and their yearly number rose to 1871 by 1970. This is

TABLE 47

Immigration by Sex, 1922-1970

Year	Total Immigration		Male Immigration		Female Immigration	
	#	per 1000	#	per 1000	#	per 1000
1922	2835	—	1745	—	1090	—
1923	1586	16.7	1043	21.8	543	11.5
1924	1991	20.4	1223	24.9	768	15.9
1925	2154	21.3	1086	21.4	1068	21.3
1926	2130	20.4	1131	21.6	999	19.2
1927	2325	21.6	1303	24.2	1022	19.0
1928	2751	24.8	1696	30.6	1055	19.1
1929	1786	15.7	1079	19.0	707	12.4
1930	988	8.5	576	9.9	412	7.1
1931	1082	9.1	669	11.3	413	6.9
1932	396	3.2	242	4.0	154	2.5
1933	319	2.5	184	3.0	135	2.1
1934	374	2.9	238	3.8	136	2.1
1935	240	1.8	147	2.3	93	1.4
1936	319	2.4	203	3.1	116	1.7
1937	320	2.4	182	2.7	138	2.0
1938	226	1.6	145	2.1	81	1.1
1939	1729	12.5	—	—	—	—
1940	181	1.2	94	1.3	87	1.2
1941	201	1.4	131	1.8	70	0.9
1942	233	1.5	143	1.9	90	1.2
1943	281	1.8	182	2.4	99	1.3
1944	124	0.8	55	0.7	69	0.8
1945	117	0.7	63	0.8	54	0.6
1946	767	4.8	457	5.8	310	3.8
1947	1516	9.3	774	9.6	742	8.9
1948	643	3.8	—	—	—	—
1949	763	4.4	407	4.8	356	4.1
1950—1963	—	—	—	—	—	—
1964	1202	4.0	629	4.2	573	3.8
1965	1354	4.4	692	4.5	662	4.3
1966	1580	5.0	791	5.0	789	4.9
1967	1834	5.6	944	5.8	890	5.4
1968	1825	5.4	921	5.5	904	5.4
1969	1834	5.3	955	5.6	879	5.1
1970	1871	5.3	924	5.3	947	5.4
1971 *	2149	6.0	—	—	—	—

* Provisional figure.

a yearly average of 1642. The increase is reflected in the relative figures: these amount to 4 per 1000 in 1964, and 5.3 per 1000 in 1970. No systematic investigation has been made of the composition of the immigrant population, or of their reasons for settling in Surinam. It is known from a recent study, however, that only a very small percentage of the Surinamers studying in the Netherlands are willing to return to Surinam "under the present circumstances" (Sedoc-Dahlberg 1971: 151-153).

§ 4.2. THE DISTRIBUTION OF THE IMMIGRANTS BY SEX, ETHNIC GROUP, AND AGE CATEGORY

The number of immigrants between 1923 and 1943 declined both for men and for women. While on the average 585 men settled in Surinam each year during this period, only 411 women did so. The sex ratio for the year 1939 is unknown, and has been ignored in this computation. As a result, the average for the whole country differs somewhat from the sum of the averages for the two sexes. In relative terms also, the males had higher figures per year than the females: respectively 10.6 and 7.4 per 1000. This minor difference between the groups is related to the fact that the contract laborers from the Dutch Indies in the 'Thirties were primarily males.

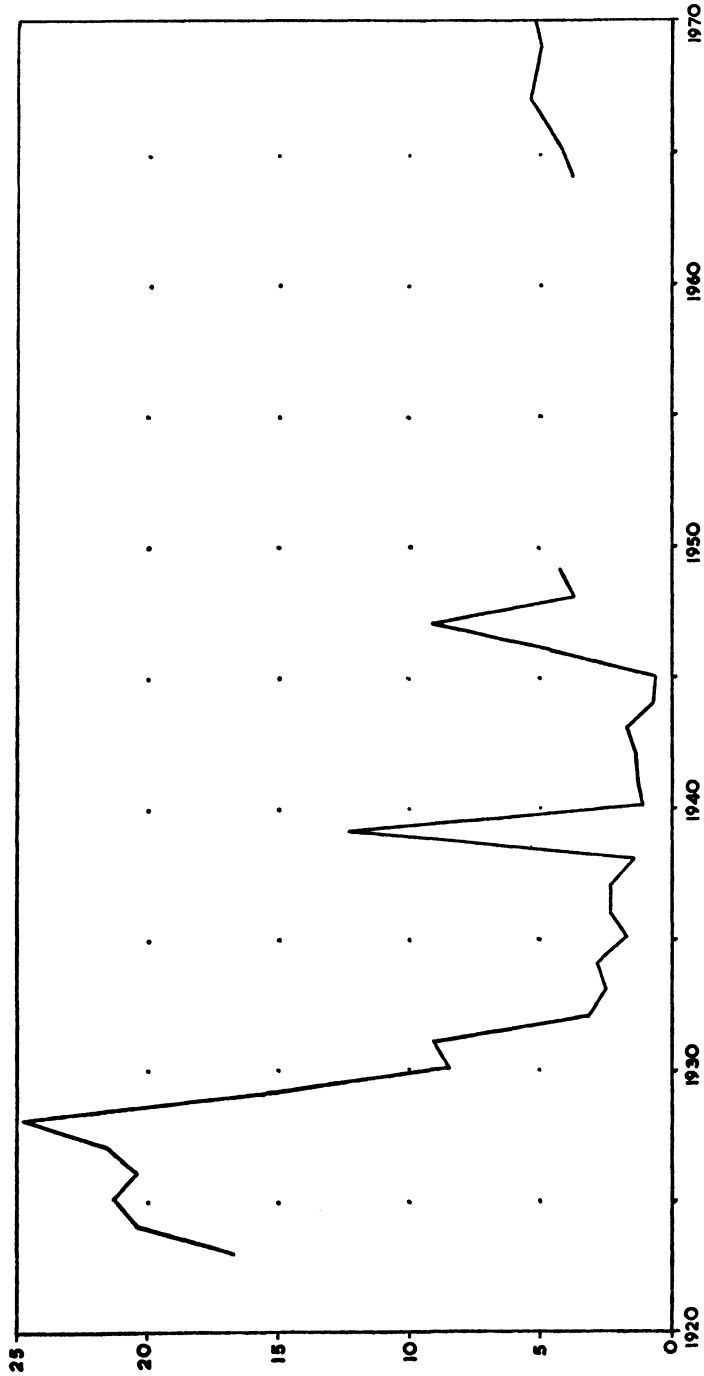
During the next stage (1943-1962), as was explained in § 1.4.3, sex distribution data are available only for the years 1944 to 1949. An increase is noted since 1946 in both male and female immigrants.

This increase continued after 1962. For men, the number of immigrants rose from 629 in 1964 to 929 in 1970. The yearly average is 836 male and 806 female settlers: the male surplus is small. The relative figures also increased: for men, the ratio went from 4.2 per 1000 in 1964 to 5.3 per 1000 in 1970. For women, the equivalent numbers were 3.8 and 5.4. The yearly average immigration figure is 5.1 per 1000 for men, 4.9 per 1000 for women.

Another aspect of immigration concerns the ethnic composition of the immigrant groups. It is difficult to assess the representation of the different ethnicities for the period 1922-1943, because the only distinctions made were "Hindustani contract laborers", "Javanese contract laborers", and "Other immigrants". The latter category consisted primarily of Creoles and Dutchmen, however, the proportion of Creoles is unknown. Furthermore, during that period there were some Hindustani and Javanese who were not (or not any longer) contract laborers, especially in the Nineteen-Forties. Again, no numbers have been given

Figure 10

SURINAM IMMIGRATION RATES PER 1000 INHABITANTS, 1920-1970



for these groups. It is therefore not possible to determine how the differential immigration developed in that era.

For the same reasons, it is not possible to draw conclusions about the 1943-1962 period, insofar as the ethnicity of immigrants is concerned. Again, it is probable that the Creoles were dominant both numerically and relatively. This observation rests on the fact that the Creoles (as well as the Jews) were among the first Surinamers to go to the Netherlands for education (van Lier: 1971: 111; Sedoc-Dahlberg 1971: 82, 84). It follows that more Creoles than Hindustani or Javanese repatriated to Surinam.

The yearly increase in immigrants noted for the 1962-1970 period holds true for the three dominant ethnic groups. The number of Creole immigrants increased from 531 in 1964 to 683 in 1970; Hindustani rose from 71 to 311, and Javanese from 15 to 63 in the same time span. The mean number of immigrants for each of these groups per year was

TABLE 48

Immigration by Ethnic Group, in Numbers and per 1000 Inhabitants of Each Ethnic Group

	Creole		Hindustani		Javanese	
Year	Number	per 1000	Number	per 1000	Number	per 1000
1964	531	4.5	71	0.6	15	0.3
1965	648	5.4	92	0.7	15	0.2
1966	632	5.2	86	0.6	28	0.5
1967	633	5.1	159	1.2	48	0.9
1968	691	5.5	151	1.1	42	0.7
1969	707	5.7	257	1.8	40	0.7
1970	683	5.4	311	2.2	63	1.1

respectively 646, 161, and 35. The numerical dominance of the Creoles during these years is related to the fact that there are more Creoles among the Surinamers living in foreign parts: more students, laborers, and academicians. Their over-representation is demonstrated not only in numbers but in proportions. For the 1964-1970 period, the average number of Creole immigrants amounted to 5.2 per 1000 Creole inhabitants of Surinam; for the Hindustani and Javanese these numbers

were 1.1 and 0.6. It is notable (see Table 48) that the ethnic differences in these ratios decreased over time.

Finally we turn our attention to the age-distribution of the immigrants. For the first two phases of the research (1922-1943, 1943-1962) no statistics were kept on ages, nor were years differentiated.

TABLE 49

Immigration by Age Group, in Numbers and per 1000 Inhabitants of Each Age Group

	0-14		15-64		65 and Older	
Year	Number	per 1000	Number	per 1000	Number	per 1000
1964	343	2.4	823	6.0	31	2.7
1965	464	3.1	861	6.1	28	2.4
1966	513	3.3	1034	7.1	32	2.7
1967	539	3.4	1251	8.3	43	3.6
1968	501	3.0	1266	8.1	58	4.9
1969	518	3.1	1256	7.8	59	4.9
1970	527	3.1	1292	7.9	50	4.2

The age-distribution employed for the 1962-1970 period is the same as that used to analyze the effects of population growth on the age-pyramid, to be covered in a later chapter. For this period it is clear that the age category 0-14 years has increased among the immigrants. A greater increase is noted in the age 15-64 group, and even the 65 and over category has grown. The numbers for the 0-14 group rose from 343 in 1964 to 527 in 1970; the labor-productive category swelled from 823 to 1292; and the group over age 65 went from 31 in 1964 to 50 in 1970. On a yearly average, 486 people aged 0-14 went to Surinam, 1111 aged 15-64, and 43 aged 65 and over. What is more interesting: the average number of children settling in Surinam each year amounted to 3.0 per 1000 people aged 0-14; for the other two age brackets it was respectively 7.3 and 3.6. Furthermore, it appears that the immigration of the 0-14 group increased very little from year to year. The same holds true for the 15-64 category, but the 65 and over group almost doubled its number of immigrants. That the greatest percentage of immigrants belonged to the 15-64 category, is related to the fact that they con-

stituted the majority among the Surinamers who, over the years, emigrated to the Netherlands. This will be demonstrated more clearly in the following chapter.

The foregoing shows that the demographic influence of immigration on Surinam was not particularly important in the years between 1922 and 1970. The mean number of immigrants for the three phases of the research were respectively 9.2, 3.6, and 5.0 per 1000 inhabitants. This ignores the significant streams of immigrants from the former Dutch East Indies and British India, because most of the contract laborers arrived before 1922. Only after the Second World War did the number of immigrants begin to increase (again). This phenomenon is largely due to the return of former Suriname emigrants, and as such it is expected to continue because the number of Surinamers living in the Netherlands is considerable, and increasing steadily.

CHAPTER V

THE DEVELOPMENT OF EMIGRATION

§ 5.1. THE DEVELOPMENT OF EMIGRATION FROM 1922 to 1970

The generally strong growth of the population contributed to the development of two interrelated migration streams, one to the capital city of Paramaribo, the other beyond the borders of Surinam. These are interrelated if migration is seen as an extension of urbanization. The interior migration is not restricted to agrarian workseekers, whose number has greatly increased as the population expanded but includes also farmers, who were until recently underemployed. Table 50 shows just how much the migration towards the city has swollen the population of the urban area (see also Kruijer 1968: 136-154). The agglomerate covers the Districts Paramaribo and Suriname, but not Para, the southern section of District Suriname. For the years 1950 and 1964 it was not possible to separate the inhabitants of Para because of the administrative techniques employed. In fact, therefore, the actual urbanization for these years is lower than the figures indicate. It is therefore safe to state that the actual rate of urbanization has been greater than the percentages in Table 50 reflect.

TABLE 50

Number of Inhabitants of the Urban Agglomerate Paramaribo and its Environment (Districts Paramaribo and Suriname)

Year	Number	Percentage of the Total Population *
Oct. 31, 1950	130600 **	63.7
March 31, 1964	220000 **	68.5
Dec. 31, 1968	268026 ***	72.0

* Includes Bush Negroes and Indians.
** Includes Para.
*** Excludes Para.

The still increasing urbanization and its concomitant urban unemployment furthered the emigration patterns which began in the 'Sixties. This latter migration, but not the problem of urbanization, will be the topic of this investigation as one of the four demographic components. A description will be given of the flow to foreign parts, but its origins and results will not, generally, be discussed. Our purpose here is to outline the degree to which emigration contributed to the growth of the population. There is also a practical reason for the limitation: the causes and effects of out-migration justify an investigation in themselves, and there was not enough time to engage in such research.

The purpose of the present chapter is to describe emigration patterns between 1922 and 1970. The division of migration by sex, ethnicity, and age will be indicated. For the nature and reliability of the source material, the reader is referred to § 1.4.3. For comparative purposes, the organization into phases, which was begun in the chapter on fertility, will be maintained.

Table 51 shows that in the 1923-1943 period the year-to-year levels of migration varied considerably. On the average some 729 persons left Surinam during this phase. Their number was lowest (136) in 1934, and highest (1695) in 1929. The relative figures also prove this variability: the average figure for emigration was 6.1 per 1000 inhabitants, but the lowest index was 1.0 in 1934, and the highest 14.9 in 1929.

Most of the emigrants were Creoles. Many of these urbanites were unemployed because of the effects of the Depression on Surinam. They left for the Dutch Antilles, to seek work in the burgeoning oil industry. Between 1925 and 1930 they numbered 2002, accounting for 37.9 % of all emigrants (van Lier 1971: 248-250). Another section of the emigrant group was made up of the sons of well-to-do Surinam families, who left to study in the Netherlands (van der Kuyp *et al.* 1959: 125). There are no numbers for this category, however. The rest of the emigrants were Dutch officials, businessmen and military personnel who left Surinam when their tour of duty was finished. Finally, some 2383 Indonesian contract laborers repatriated in the years from 1928 to 1931, and another 2254 returned to Indonesia between 1935 and 1939.

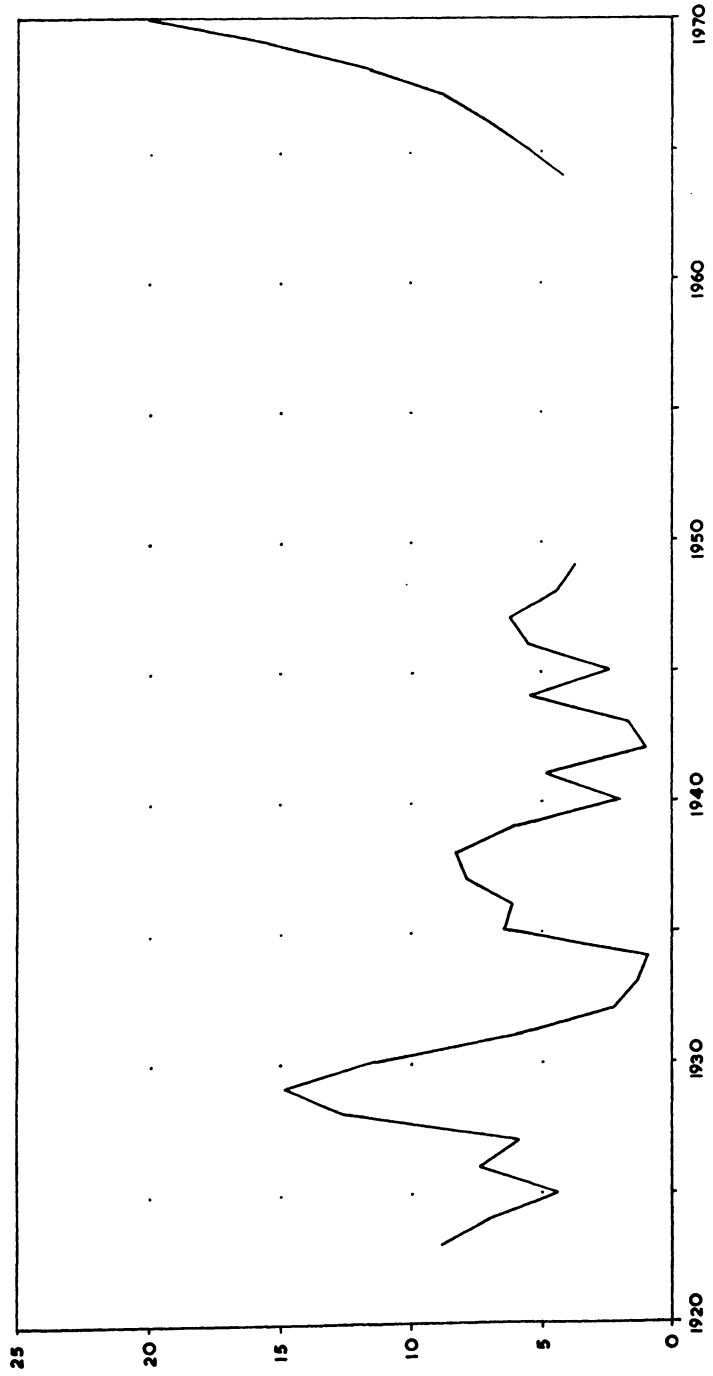
Between 1943 and 1962, an average of 706 persons left Surinam each year. The lowest and highest numbers were recorded respectively in 1943 and 1947. The average emigration rate was 4.3 per 1000 inhabitants thus lower than in the 1922-1943 era. The highest and lowest rates were, of course, also in 1947 and 1943.

TABLE 51
Emigration by Sex, 1922-1970

Year	Total Emigrants		Male Emigrants		Female Emigrants	
	Number	Per 1000	Number	Per 1000	Number	Per 1000
1922	1715	—	1015	—	700	—
1923	851	8.9	514	10.7	337	7.1
1924	681	7.0	444	9.0	237	4.9
1925	445	4.4	281	5.5	164	3.2
1926	773	7.4	516	9.8	257	4.9
1927	640	5.9	441	8.2	199	3.7
1928	1395	12.6	911	16.4	484	8.7
1929	1695	14.9	1080	19.0	615	10.8
1930	1328	11.4	857	14.8	471	8.1
1931	715	6.0	418	7.1	297	5.0
1932	279	2.3	181	3.0	98	1.6
1933	184	1.4	88	1.4	96	1.5
1934	136	1.0	63	1.0	73	1.1
1935	854	6.6	473	7.4	381	5.9
1936	811	6.2	424	6.5	387	5.8
1937	1065	8.0	703	10.6	362	5.4
1938	1131	8.4	771	11.6	360	5.2
1939	850	6.1	484	7.1	366	5.2
1940	305	2.1	122	1.7	183	2.5
1941	727	5.0	404	5.6	323	4.4
1942	167	1.1	79	1.0	88	1.1
1943	269	1.8	112	1.5	157	2.0
1944	859	5.6	694	9.2	165	2.1
1945	391	2.5	241	3.1	150	1.9
1946	913	5.7	506	6.4	407	5.0
1947	1057	6.4	359	4.4	498	6.0
1948	782	4.6	375	4.5	407	4.8
1949	673	3.9	298	3.5	375	4.3
1950—1963	—	—	—	—	—	—
1964	1302	4.4	663	4.5	639	4.3
1965	1768	5.7	943	6.1	825	5.3
1966	2256	7.1	1167	7.4	1089	6.8
1967	2942	9.0	1499	9.2	1443	8.8
1968	3947	11.8	1975	11.8	1972	11.7
1969	5384	15.7	2760	16.2	2624	15.3
1970	7097	20.4	3544	20.4	3553	20.4
1971 *	7210	20.4	—	—	—	—

* Provisional figures.

Figure 11
SURINAM EMIGRATION RATES PER 1000 INHABITANTS, 1920–1970



By far the majority of emigrants in this phase went to the Netherlands. From 1946 to 1956, they numbered 7860. The group consisted of students both from the higher and the lower income groups, as well as Dutch officials and businessmen. Emigration to the United States also increased during this time (van der Kuyp *et al.* 1959: 125, 126, 154). It must also be reported that in 1947 a total of 756 Javanese left Surinam to return to Indonesia. In 1954 and 1956 other Javanese left the country: more than 1000 in 1954 alone. Their primary motive appears to have been homesickness. Over 50 % of these repatriates were farmers. The older age categories were over-represented among the returnees, and they were characterized by a noticeable male surplus (Heeren 1967: 109-114). In 1956, a group of 150 families found a new homeland in French Guyana, Surinam's eastern neighbor.

The third phase of the development of emigration, the period after 1962, is characterized by a strong yearly increase in the volume of persons leaving Surinam. Their number amounted to 1302 in 1964 and increased to 7097 in 1970, meaning that the yearly average for the period was 3528. The relative figures also underscore the growing import of emigration: in 1964 the loss accounted for 4.4 persons per 1000 population, and in 1970 for 20.4 per 1000. Emigration's influence on Surinam's demographic development is perhaps best illustrated by the fact that by 1970 out-migration accounted for about 70 % of the natural increase, while the balance of migration accounted for no less than 50 % of the natural growth. This demographic factor, especially

TABLE 52

Emigration and Net Migration as Percentages of the Natural Increase

Year	Natural Incr.	Emigration		Net Migration	
	per 1000 Inhabitants	per 1000 Inh.	in % of Natural Increase	per 1000 Inh.	in % of Natural Increase
1964	38.2	4.4	11.5	— 0.4	1.0
1965	34.6	5.7	16.4	— 1.3	3.7
1966	34.1	7.1	20.8	— 2.1	6.1
1967	31.4	9.0	28.6	— 3.4	10.8
1968	29.9	11.8	39.4	— 6.4	21.4
1969	31.2	15.7	50.3	—10.4	33.3
1970	29.2	20.4	69.8	—15.1	51.7

because of its age-specific nature, has certainly influenced the socio-economic development of Surinam.

Although no research was conducted in the motives of the emigrants, the impression exists that increasing unemployment was one of the dominant reasons for leaving. The data on the occupations of a sample of the emigrants also bear this out. Information was collected on 931 persons leaving Surinam in 1970, and on 862 who left in 1971 (see Table 53). A high percentage of persons failed to list an occupation, which indicates the importance of unemployment as a motive in emigration. It must be acknowledged that this category includes persons

TABLE 53

Number and Percentages of Persons Claiming Particular Occupations among Two Samples of Emigrants, 1970 and 1971

	1970		1971	
Occupation	#	%	#	%
None Listed (Mostly Unemployed, some Students)	451	48.4	731	84.8
None Listed (Mostly Dependents)	285	30.6		
Lesser Official	60	6.4	41	4.7
Unskilled Laborer	48	5.1	29	3.3
Skilled Laborer	40	4.2	34	3.9
Nurse	16	1.7	5	0.5
Teacher	16	1.7	12	1.3
Middle and High Official	13	1.3	7	0.8
Other	2	0.2	3	0.3
Total	931	99.6	862	99.6

who did have a profession but did not record it, but their number is unknown. Table 53 also indicates that trained individuals are leaving. Their number may actually be higher than this sample indicates, because there are skilled workers among the unemployed. The outflow thus means not only the loss of Surinam's most productive workforces, but of the money invested in the education of that population (Cinanni 1969). An estimate of that investment, whose results do not benefit Surinam, may be instructive. However, a number of objections could be quoted against such an approach (Friedlander 1965; Tidrick 1966).

§ 5.2. THE DISTRIBUTION OF EMIGRANTS BY SEX, ETHNIC GROUP, AND AGE

The extent to which emigration between 1922 and 1970 has a sex-specific influence on the population of Surinam is indicated in Table 51. For the 1923-1943 period there appears to be no clear trend favoring either sex: there is too much random variation in both categories from year to year. The average number of male emigrants was 446, that for females was 283. The relative figures also show the same irregularity in emigration. Calculated on the basis of the whole period, the average yearly emigration figure is 7.5 per 1000 population for men, and 4.6 per 1000 per for women.

For the 1943-1962 period, sex-specific migration data are available only for the years 1943-1949 (see § 1.4.3). For that term, it may be noticed that the yearly variations did not disappear, but that the sex ratio did begin to lessen. For some years, the number of female emigrants was actually greater than that of males. This decrease in the differential emigration rate is probably related to the fact that sex-specific migration of contract laborers virtually ceased after 1938. This allowed the sex ratio of the population at large to develop more normally, which in turn reduced the probability that males would be overrepresented in the emigration.

For the post-1962 period a yearly increase in the numbers of both male and female emigrants may be ascertained. For men, this total rose from 663 in 1964 to 3544 in 1970, while the equivalent figures for women were 639 and 3553. The mean yearly number of people to leave Surinam included 1793 males and 1735 females. In this period the men are again in the majority both in absolute and in relative figures, but the differences are minor. This is probably related to the fact that it was primarily heads of households who left to seek work in the Netherlands. And where students are concerned, it was primarily males who left Surinam for study purposes. These remarks are especially applicable to the first few years of this period. Only in the later years did the number of female emigrants increase. The emigration of whole families is a phenomenon of relatively recent origin, but once it occurred, the number of women among those who left Surinam increased steadily. The rising importance of family migration is demonstrated in the fact that the percentage of emigrants aged 0-14 increased more rapidly between 1964 and 1970 than the percentage of those aged 15-64 and that of the category 65 and older. The importance of family migration

is evidenced in some figures collected in 1971: a sample of 862 emigrated individuals showed that 378 (44 %) left in families.

Not only the absolute, but the relative emigration figures show a rapid rise for both sexes. As Table 51 indicates, the average yearly emigration rate amounted to 10.8 males and 10.3 females per 1000 population. It is also clear that the number of women leaving Surinam is both relatively and absolutely equivalent to the number of men, at least for the post-1964 period.

As was the case with immigration, there are problems in ascertaining the proportions of the ethnic groups among the emigrants in the 1922-1943 period. As a result, it is not possible to indicate the ethnic differentation of emigration for that period.

For the same reasons, almost nothing can be said about the ethnic composition of emigration in the 1943-1962 period. Again, it must suffice to state that in this as in the preceding period, there were probably more Creoles among the emigrants than any other ethnic category. This is deduced from the fact that, along with the Jews, the Creoles were the first Surinamers to study in the Netherlands (van Lier 1971: 111; Sedoc-Dahlberg 1971: 82-84).

During the 1962-1970 period the number of emigrants increased among all three major ethnic groups (see Table 54). For the Creoles the number rose from 761 in 1964 to 4524 in 1970, for the Hindustani from 158 to 1694, and the number of Javanese emigrants rose from 36 to 212. The average number of persons to leave Surinam was respectively 2226, 651, and 93 for the three groups. It is not surprising

TABLE 54

Emigration by Ethnic Group, in Absolute Numbers and per 1000 of Each Ethnic Group

	Creole		Hindustani		Javanese	
Year	Number	Per 1000	Number	Per 1000	Number	Per 1000
1964	761	6.5	158	1.3	36	0.7
1965	1122	9.4	234	1.9	47	0.9
1966	1557	12.8	289	2.3	48	0.9
1967	1878	15.2	418	3.2	83	1.5
1968	2412	19.3	698	5.2	104	1.9
1969	3329	26.4	1070	7.8	122	2.1
1970	4524	35.9	1694	12.0	212	3.7

that the Creoles were in the majority: they are the most Westernized and the most urbanized of the three groups, and they suffer the highest rate of unemployment in both relative and absolute numbers. These three factors weigh heavily in the migration to the Netherlands. Creole overrepresentation is also visible in the emigration percentages: during this period the average yearly numbers were 17.9 per 1000 population for the Creoles, 4.8 per 1000 for the Hindustani, and 1.6 for the Javanese. Note, however, that the differences between the ethnic-specific emigration rates are steadily declining.

For the first two phases (1922-1943, 1943-1962) of the research, there were no data on the age distribution of the emigrants. For some years, this information is not even available for the overall population. Here again, the chosen division in age categories will be treated in a later chapter dealing with the results of population growth on the population pyramid.

For the 1962-1970 period it appears that the number of emigrants increased among all age categories. For the 0-14 bracket the numbers rose from 290 in 1964 to 2193 in 1970. For the labor producing age range it rose from 977 to 4712, and for the group aged 65 and over, figures rose from 27 to 112. The yearly average number of children aged 0-14 which left for the Netherlands was 989. The numbers for the two other categories were 2466 and 57. More interesting are the relative figures for the three age groups. Each year an average of 6.1 per 1000 people aged 0-14 left the country, for the 15-64 bracket the figures are 15.9 per 1000, and for the elderly category 4.8. For all three classes

TABLE 55

Emigration by Age Group, in Absolute Numbers and per 1000 of Each Age Group

	0-14		15-64		65 +	
Year	Number	Per 1000	Number	Per 1000	Number	Per 1000
1964	290	2.0	977	7.1	27	2.3
1965	455	3.0	1280	9.0	33	2.8
1966	561	3.6	1644	11.3	41	3.5
1967	829	5.2	2059	13.7	47	4.0
1968	1095	6.7	2791	18.0	61	5.1
1969	1503	9.1	3802	23.8	78	6.6
1970	2193	13.1	4712	28.9	112	9.4

the yearly number of emigrants increased in the 1964-1970 era. The figures are highest for the 15-64 category, again supporting the idea that unemployment was a major factor in migration. Friedlander (1955: 83) has come to a similar conclusion for Puerto Rico. The results of this loss in the labor force are noticed when a comparison is made with the 15-64 year old category in the population at large: Table 56 shows that that age group is overrepresented among emigrants. This observation holds true for all the years between 1964 and 1970, although the *degree* of overrepresentation is steadily declining. It fell from 75.0 % in 1964 to 66.3 % in 1970. This is, of course, a function of the fact that the relative proportion of the other age categories increased.

TABLE 56

Percentual Representation of the Age Group 15-64 among the Emigrants and in the Total Population.

	Percentage of Persons Aged 15-64 Years	
Year	Among the Emigrants	Among the Total Population
1964	75.0	46.1
1965	72.3	45.9
1966	72.8	45.9
1967	69.9	46.2
1968	70.7	46.5
1969	70.6	46.7
1970	66.3	46.9

The foregoing has shown that emigration was an important component of the demography between 1922 and 1970. The strong pull of foreign parts has had various effects on Surinam. For reasons stipulated earlier, it is not our purpose to investigate these. Nevertheless, some remarks are justified because, as was noted in § 2.2.3, the results of emigration clarify the demographic process, especially in regard to the birth rate. One of the most obvious consequences of emigration is the lessening of population pressure. This reduction is greater than the number of emigrants indicates because young people, those belonging to the most fertile age groups, are overrepresented among those leaving the country. Because of this, a relatively large number of births in Surinam does not take place. Besides this braking effect on the birth

rate, emigration also influences the age structure of the remaining population, especially that of the labor-productive age group. This will be discussed more fully in the chapter on population growth.

Not only the age-selective aspect of emigration has affected fertility, for the sex-selective character of the exodus to the Netherlands has helped depress the birth rate. Over the years, the number of men aged 20-49 has declined more than that of women aged 15-44. This has reduced the chances for women in that age range to raise families. Probably this factor had a negative influence on the birth levels of the 'Sixties. Note, however, that Table 51 indicates that the differences in emigration rates for the sexes have disappeared since 1968.

TABLE 57

Sex Ratio of Persons in the Fertile Age Group

Dec. 31 of Year	$\frac{\text{Males aged 20-49}}{\text{Females aged 15-44}} \times 100$			
	Creole	Hindustani	Javanese	Total
1963	76.4	80.0	83.3	80.1
1964	75.4	79.2	82.4	79.3
1965	75.5	79.2	82.7	79.3
1966	75.7	79.2	82.7	79.4
1967	75.0	77.5	81.7	78.2
1968	74.4	77.2	81.8	77.9
1969	73.6	76.7	82.1	77.4
1970	72.8	76.3	81.7	76.9

That the distribution of the sexes has changed over the years is demonstrated in Table 57, which indicates that the sex ratio declined between 1963 and 1970. Partly as a result of the surplus of women in the fertile age bracket, both the birth rate and the fertility rate have been negatively affected. The sex ratio is lowest for the Creoles, which helps explain the differences in birth rates between Creoles and other ethnic groups, as was noted in § 2.2.3. But insofar as decline in the sex ratios is concerned, differences between the ethnic groups are extremely minor.

CHAPTER VI

THE DEVELOPMENT OF THE POPULATION

§ 6.1. THE DEVELOPMENT OF THE POPULATION FROM 1922 TO 1970

In the fifty years from 1922 to 1970, the population of Surinam increased from 93,762 to 349,637. The growth percentage of the population from year to year during this half century has been manifestly differentiated, as Table 58 indicates. Three major phases are discernible in the growth pattern. In the 1922-1943 period with its "low" mean yearly growth rate of 21.5 per 1000, a noticeably irregular trend probably results from the waves of migration caused by the arrival of contract laborers. The second period, 1943-1962, is characterized by a high growth rate: 31.4 per 1000. The third phase is accompanied by a slight turn-down in the growth rate: the average for this period is 29.6 per 1000 (see also Lamur 1972: 33-34).

This section will investigate which of the four major demographic components — fertility, mortality, immigration, and emigration — had the greatest effect on population growth in each of the three aforementioned phases. In general terms, on the basis of Table 59 and Figure 12, it may be concluded that population changes between 1922 and 1943 resulted primarily from birth, death, and immigration: emigration played almost no role. During the second phase, the influence of fertility was greater than in the previous period; especially 1958 (39.8) and 1959 (40.2) gave very high birth rates. Mortality also affected population development. But migration was of almost no importance. In the period after 1962, fertility retained its position as the most important growth factor, although its power steadily diminishes both in absolute terms and in comparison with the other components. A factor which is becoming more important since 1964 is emigration. In 1970, it accounted for as much as 20.4 persons per 1000 population, which, as noted earlier, is equivalent to some 70 % of the natural growth. Although the return migration to Surinam also increased during this era, its relative importance is quite low.

A detailed examination of the foregoing leads to the following observations. The average yearly population increase of 21.5 per 1000 during the phase 1922-1943 is made up of a birth rate of 35.8, a death rate

TABLE 58

Population and Population Increase, 1922-1970

31 Dec. of the year	Population 1922-1949 according to 1921 Census	Population 1922-1949 according to 1950 Census	Increase	
			Absolute	Per 1000
1922	110,933	93,762	—	—
1923	112,818	95,647	1,885	19.9**
1924	116,058	98,887	3,240	33.3
1925	119,926	102,755	3,868	38.3
1926	122,982	105,811	3,056	29.3
1927	126,041	108,870	3,059	28.4
1928	129,297	112,126	3,256	29.4
1929	131,687	114,516	2,390	21.0
1930	133,651	116,480	1,964	17.0
1931	136,218	119,047	2,567	21.7
1932	138,694	121,523	2,476	20.5
1933	141,508	124,337	2,814	22.8
1934	144,385	127,214	2,877	22.8
1935	146,843	129,672	2,458	19.1
1936	148,971	131,800	2,128	16.2
1937	150,896	133,725	1,925	14.4
1938	152,589	135,418	1,693	12.5
1939	156,332	139,161	3,743	27.2
1940	159,396	142,225	3,064	21.7
1941	162,082	144,911	2,686	18.7
1942	165,159	147,988	3,077	21.0
1943	167,836	150,665	2,677	17.9
1944	169,980	152,809	2,144	14.1
1945	173,954	156,783	3,974	25.6
1946	177,880	160,709	3,926	24.7
1947	181,984	164,813	4,104	25.2
1948	186,104	168,933	4,120	24.6
1949	190,424	173,253	4,320	25.2
1950		178,078	4,825	27.4
1951		183,784	5,706	31.5
1952		190,197	6,413	34.2
1953		196,877	6,680	34.5
1954		204,163	7,286	36.3
1955		211,743	7,580	36.4
1956		219,843	8,100	37.5
1957		228,017	8,174	36.5
1958		237,291	9,274	39.8

** See footnote Table 59.

TABLE 58

31 Dec. of the year	Population 1922-1949 according to 1921 Census	Population 1922-1949 according to 1950 Census	Increase	
			Absolute	Per 1000
1959		247,042	9,751	40.2
1960		256,526	9,484	37.6
1961		266,873	10,347	39.5
1962		277,748	10,875	39.9
1963		289,282	10,780	38.0
1964		300,439	11,157	37.8
1965		310,572	10,133	33.1
1966		320,667	10,095	31.9
1967		329,792	9,125	28.0
1968		337,649	7,857	23.5
1969		344,736	7,087	20.7
1970		349,637	4,901	14.1
1971 *		355,690	6,053	17.1

* Provisional figure.

TABLE 59

Growth of Fertility (F), Mortality (M), Immigration (I), and Emigration (E) between 1923 and 1970, per 1000 Inhabitants

Year	F	M	F—M	I	E	I—E	Growth**
1923	36.5	24.4	12.1	16.7	8.9	7.8	19.9
1924	39.4	19.5	19.9	20.4	7.0	13.4	33.3
1925	38.9	17.5	21.4	21.3	4.4	16.9	38.3
1926	37.6	21.3	16.3	20.4	7.4	13.0	29.3
1927	32.4	19.6	12.8	21.6	5.9	15.7	28.5
1928	34.6	17.4	17.2	24.8	12.6	12.2	29.4
1929	38.2	17.9	20.3	15.7	14.9	0.8	21.1
1930	36.0	16.0	20.0	8.5	11.4	—2.9	17.1
1931	35.3	16.6	18.7	9.1	6.0	3.1	21.8
1932	34.8	15.1	19.7	3.2	2.3	0.9	20.6
1933	36.8	15.0	21.8	2.5	1.4	1.1	22.9
1934	35.5	14.5	21.0	2.9	1.0	1.9	22.9

** Growth = (F—M) + (I—E). For some years this figure is larger than the growth rate computed by relating the population increase to the size of the population. This is the result of the use of figures correct to one decimal place only. The differences may be ignored.

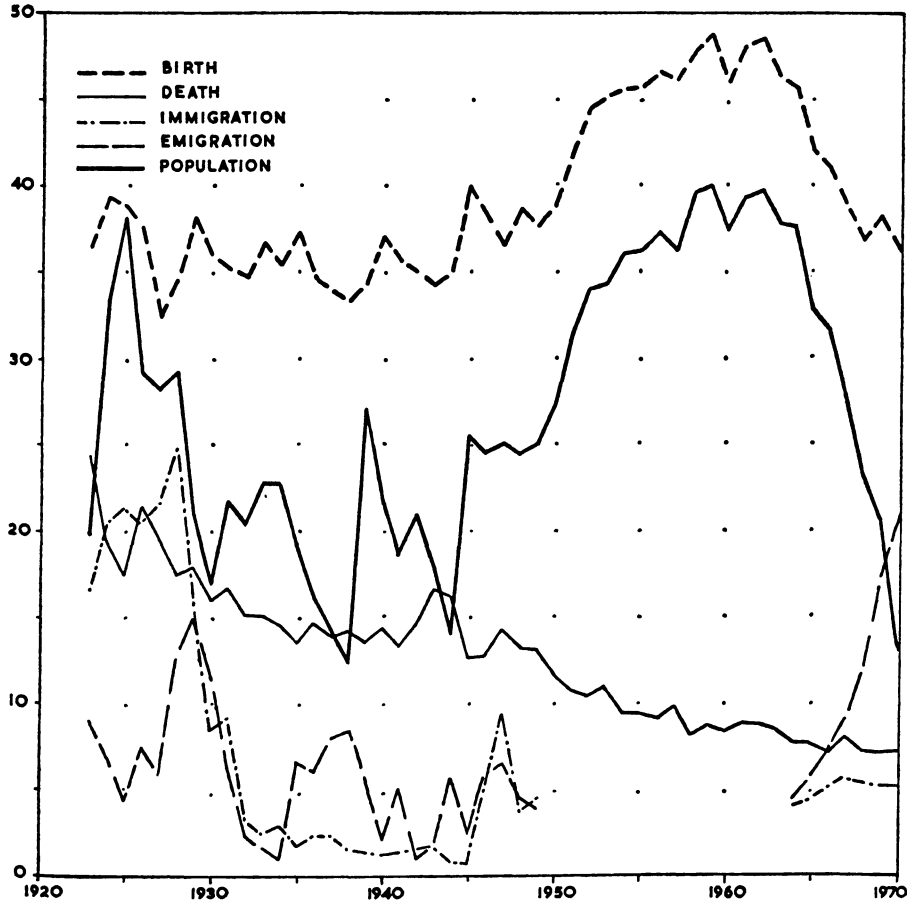
TABLE 59

Year	F	M	F—M	I	E	I—E	Growth**
1935	37.4	13.5	23.9	1.8	6.6	—4.8	19.1
1936	34.6	14.6	20.0	2.4	6.2	—3.8	16.2
1937	34.0	13.9	20.1	2.4	8.0	—5.6	14.5
1938	33.5	14.2	19.3	1.6	8.4	—6.8	12.5
1939	34.5	13.6	20.9	12.5	6.1	6.4	27.3
1940	37.1	14.4	22.7	1.2	2.1	—0.9	21.8
1941	35.8	13.4	22.4	1.4	5.0	—3.6	18.8
1942	35.2	14.6	20.6	1.5	1.1	0.4	21.0
1943	34.4	16.6	17.8	1.8	1.8	0.0	17.8
1944	35.2	16.2	19.0	0.8	5.6	—4.8	14.2
1945	40.1	12.6	27.5	0.7	2.5	—1.8	25.7
1946	38.4	12.7	25.7	4.8	5.7	—0.9	24.8
1947	36.7	14.3	22.4	9.3	6.4	2.9	25.3
1948	38.8	13.2	25.6	3.8	4.6	—0.8	24.8
1949	37.8	13.1	24.7	4.4	3.9	0.5	25.2
1950	39.0	11.6	27.4				
1951	42.2	10.7	31.5				
1952	44.7	10.4	34.3				
1953	45.4	10.9	34.5				
1954	45.8	9.5	36.3				
1955	45.9	9.4	36.5				
1956	46.8	9.2	37.6				
1957	46.3	9.8	36.5				
1958	48.0	8.1	39.9				
1959	49.0	8.7	40.3				
1960	46.1	8.4	37.7				
1961	48.3	8.8	39.5				
1962	48.7	8.8	39.9				
1963	46.5	8.4	38.1				
1964	45.0	7.7	38.2	4.0	4.4	— 0.4	37.8
1965	42.3	7.7	34.6	4.4	5.7	— 1.3	33.3
1966	41.3	7.2	34.1	5.0	7.1	— 2.1	32.0
1967	39.1	7.7	31.4	5.6	9.0	— 3.4	28.0
1968	37.1	7.2	29.9	5.4	11.8	— 6.4	23.5
1969	38.4	7.2	31.2	5.3	15.7	—10.4	20.8
1970	36.6	7.4	29.2	5.3	20.4	—15.4	14.1
1971 *	39.0	7.4	31.6	6.0	20.4	—14.4	17.2

* Provisional figure.

Figure 12

DEVELOPMENT OF BIRTH, DEATH, IMMIGRATION, EMIGRATION, AND TOTAL POPULATION GROWTH (Per 1000 Inhabitants)



of 16.3, an immigration rate of 9.2, and emigration rate of 6.1 per 1000 inhabitants. For the 1943-1962 period, the population increase of 31.4 per 1000 resulted from a birth rate of 42.8 and a mortality figure of 11.1. Migration figures for this timespan were of almost no consequence, as discussed in § 1.4.3. Finally, for the post-1962 period the growth of 29.6 was a function of a fertility figure of 41.7, a mortality of 7.7., with 5.0 immigration and 10.5 emigration rates.

From this quantification it appears that the change in population size in the first phase covered by this study was determined by birth and death rates. For the second phase, especially the decades of the 'Fifties and 'Sixties, fertility alone was clearly the dominant factor. This remains true in the post-1962 phase, although here the emigration rate helped contribute to the population development.

TABLE 60

Average Yearly Growth of the Population and its Components, per 1000 Inhabitants

Period	F	M	F—M	I	E	I—E	Growth
1923—1943	35.8	16.3	19.5	9.1	6.1	3.1	21.5*
1943—1962	42.8	11.1	31.7	—	—	—	31.4**
1962—1970	41.7	7.7	34.0	5.0	10.5	—5.5	29.6***

* F—M + I—E = 22.6; See remarks in footnote Table 59.
** F—M + I—E = 31.7; See remarks in footnote Table 59.
*** F—M + I—E = 28.5; See remarks in footnote Table 59.

§ 6.2. DIFFERENTIAL POPULATION DEVELOPMENT BY ETHNIC GROUP

The previous section demonstrated the degree to which each of the demographic components contributed to Surinam's population growth. We will now examine the relative contributions of the three dominant ethnic groups. It is clear from Tables 64 through 67 that during the 1922-1943 period the growth of the Javanese population was stronger than that of the other groups, in part because of the immigration of contract laborers. Mean yearly growth was 16.9 per 1000 for the Creoles, 29.0 for the Hindustani, and 33.7 for the Javanese. For the next period, the contribution of the Hindustani was greatest, and that of the Javanese least. In this 1943-1962 phase, the mean yearly population increase per 1000 inhabitants was 27.6 for Creoles, 42.5 for Hindustani, and 19.6 for Javanese. This great increase among the Hindustani is primarily

TABLE 61

Population and Population Increase 1922-1970: Creole

31 Dec. of Year	Population	Increase	
		In Numbers	Per 1000
1922	44,288	—	—
1923	45,480	1,192	26.5
1924	46,748	1,268	27.4
1925	47,501	753	15.9
1926	46,744	— 757	—16.0
1927	47,635	891	18.8
1928	47,959	324	6.7
1929	48,141	182	3.7
1930	48,823	682	14.0
1931	49,914	1,091	22.0
1932	50,808	894	17.7
1933	51,829	1,021	19.8
1934	53,132	1,303	24.8
1935	54,336	1,204	22.4
1936	55,329	993	18.1
1937	56,899	1,570	27.9
1938	57,705	806	14.0
1939	58,967	1,262	21.6
1940	59,359	392	6.6
1941	59,565	206	3.4
1942	61,359	1,794	29.6
1943	63,342	1,983	31.8
1944	63,973	631	9.9
1945	66,808	2,835	43.3
1946	68,023	1,215	18.0
1947	69,621	1,598	23.2
1948	70,843	1,222	17.3
1949	69,651	—1,192	—16.9
1950	71,678	2,027	28.6
1951	73,882	2,204	30.2
1952	76,301	2,419	32.2
1953	79,017	2,716	34.9
1954	82,031	3,014	37.4
1955	85,167	3,136	37.5
1956	88,306	3,139	36.1
1957	91,537	3,231	35.9
1958	95,042	3,505	37.5
1959	98,772	3,730	38.4
1960	102,649	3,877	38.4

31 Dec. of Year	Population	Increase	
		In Numbers	Per 1000
1961	106,381	3,732	35.7
1962	110,062	3,681	34.0
1963	113,929	3,595	32.0
1964	117,396	3,467	29.9
1965	120,065	2,669	22.4
1966	122,418	2,353	19.4
1967	124,149	1,731	14.0
1968	125,455	1,306	10.4
1969	126,102	647	5.1
1970	125,240	— 862	— 6.8

TABLE 62

Population and Population Increase 1922-1970: Hindustani

31 Dec. of Year	Population	Increase	
		In Numbers	Per 1000
1922	26,084	—	—
1923	26,528	444	16.3
1924	27,197	669	24.9
1925	28,087	890	32.1
1926	28,736	649	22.8
1927	29,280	544	18.7
1928	29,960	680	22.9
1929	30,933	973	31.9
1930	31,477	544	17.4
1931	32,310	833	26.1
1932	32,974	664	20.3
1933	33,887	913	27.3
1934	34,947	1,060	30.7
1935	36,331	1,384	38.8
1936	36,907	576	15.7
1937	39,398	2,491	65.2
1938	40,028	630	15.8
1939	41,228	1,200	29.5
1940	42,538	1,310	31.2
1941	44,854	2,316	53.0
1942	45,412	558	12.3
1943	48,057	2,645	56.5
1944	49,907	1,850	37.7
1945	51,530	1,623	32.0

31 Dec. of Year	Population	Increase	
		In Numbers	Per 1000
1946	53,426	1,896	36.1
1947	55,151	1,725	31.7
1948	56,781	1,630	29.1
1949	60,269	3,488	59.5
1950	62,570	2,301	37.4
1951	65,148	2,578	40.3
1952	68,040	2,892	43.4
1953	71,071	3,031	43.5
1954	74,259	3,188	43.8
1955	77,550	3,291	43.3
1956	81,053	3,503	44.1
1957	84,526	3,473	41.9
1958	88,741	4,215	48.6
1959	93,129	4,388	48.2
1960	97,246	4,117	43.2
1961	101,720	4,474	44.9
1962	106,589	4,869	46.7
1963	111,409	4,849	44.4
1964	116,407	4,998	43.8
1965	121,162	4,755	40.0
1966	126,082	4,920	39.7
1967	130,721	4,639	36.1
1968	134,756	4,035	30.3
1969	138,873	4,117	30.0
1970	142,049	3,176	22.6

TABLE 63

Population and Population Increase 1922-1970: Javanese

31 Dec. of Year	Population	Increase	
		In Numbers	Per 1000
1922	15,845	—	—
1923	16,001	156	9.7
1924	17,459	1,458	87.1
1925	19,517	2,058	111.3
1926	22,807	3,290	155.4
1927	24,706	1,899	79.9
1928	26,729	2,023	78.6
1929	27,652	923	33.9
1930	28,241	589	21.0

31 Dec. of Year	Population	Increase	
		In Numbers	Per 1000
1931	28,818	577	20.2
1932	29,573	755	25.8
1933	30,238	665	22.2
1934	30,876	638	20.8
1935	30,702	— 174	— 5.6
1936	31,092	390	12.6
1937	29,246	—1,846	—61.1
1938	29,439	193	6.5
1939	30,156	717	24.0
1940	31,681	1,525	49.3
1941	31,879	198	6.2
1942	32,178	299	9.3
1943	32,240	62	1.9
1944	31,832	— 408	—12.7
1945	31,588	— 244	— 7.6
1946	31,858	270	8.5
1947	32,231	373	11.6
1948	33,179	948	28.9
1949	34,914	1,735	50.9
1950	35,308	394	11.2
1951	36,042	734	20.5
1952	36,885	843	23.1
1953	37,592	707	18.9
1954	38,393	801	21.0
1955	39,257	864	22.2
1956	40,244	987	24.8
1957	41,221	977	23.9
1958	42,360	1,139	27.2
1959	43,669	1,309	30.4
1960	44,803	1,134	25.6
1961	46,232	1,429	31.3
1962	47,716	1,484	31.5
1963	48,053	1,495	31.2
1964	49,467	1,414	28.9
1965	51,018	1,551	30.8
1966	52,455	1,437	27.7
1967	53,932	1,477	27.7
1968	55,369	1,437	26.2
1969	56,640	1,271	22.6
1970	57,893	1,253	21.8

TABLE 64
Mean Yearly Growth of the Population by Ethnic Group, per 1000 Inhabitants

Period	Creole	Hindustani	Javanese	Total*
1923—1943	16.9	29.0	33.7	21.5
1943—1962	27.6	42.5	19.6	31.4
1962—1970	17.8	37.0	27.6	29.6

* Includes smaller ethnic groups: Chinese, Europeans, etc.

TABLE 65
Mean Yearly Growth of the Population and its Components, per 1000 Inhabitants: Creole

Period	F	M	F—M	I	E	I—E	Growth
1923—1943	36.0	17.8*	18.2	—	—	— 1.3	16.9
1943—1962	42.1	11.4	30.7	—	—	— 2.9	27.6
1962—1970	34.6	6.8	27.8	5.2	17.9	—12.7**	17.8

* Figures based on data for 1926—1943.
** Figures based on data for 1964—1970.

TABLE 66
Mean Yearly Growth of the Population and its Components, per 1000 Inhabitants: Hindustani

Period	F	M	F—M	I	E	I—E	Growth
1923—1943	46.3	15.3*	31.0	—	—	— 2.0	29.0
1943—1962	50.8	10.5	40.3	—	—	2.2	42.5
1962—1970	46.4	6.4	40.0	1.1	4.8	— 3.7**	37.0

* Figures based on data for 1926—1943.
** Figures based on data for 1964—1970.

TABLE 67
Mean Yearly Growth of the Population and its Components, per 1000 Inhabitants: Javanese

Period	F	M	F—M	I	E	I—E	Growth
1923—1943	28.9	13.0*	15.9	—	—	17.8	33.7
1943—1962	32.4	12.3	20.1	—	—	— 0.5	19.6
1962—1970	38.7	10.3	28.4	0.6	1.6	— 1.0**	27.6

* Figures based on data for 1926—1943.
** Figures based on data for 1964—1970.

the result of their high rate of natural increase. This amounted to 40.3, while the rates for Creoles and Javanese were respectively 30.7 and 20.1 per 1000.

For both the Creole and the Hindustani populations, the rate of increase declined after 1962, but for the Javanese it rose again. In spite of this, the Javanese did not have the highest growth rate: the Hindustani fertility levels of 37.0 per 1000 outranked those of the Creoles (at 17.8) and the Javanese (at 27.6 per 1000). The Creoles, with 17.8, had the lowest growth levels, as they did in the first phase. The Javanese rate of increase was 27.6 per 1000.

The vigorous growth of the Hindustani population during the post-1962 period is also evidenced in their high rate of natural increase, which maintained itself at a level of about 40.0 per 1000. Creole rates of natural increase for the same period declined to 27.8 from their high of 30.7 in the 1943-1962 era. The natural growth levels of the Javanese increased from 20.1 to 28.4 per 1000, which is a considerable increase but still much lower than that of the Hindustani. The decline in the figures for the Creole population is a function not only of the lower rate of natural increase, but of emigration. For the period 1962-1970, about 17 of every 1000 Creoles left Surinam. As mentioned earlier, the braking effect of emigration on population growth is magnified by the fact that people in the most fertile age categories are leaving the country, meaning that a great number of expected births for this category occurs outside of Surinam.

§ 6.3. THE RESULTS OF THE DEVELOPMENT OF THE POPULATION

The discussion of the effects of the population growth on Surinam must be curtailed, in view of the extent of the subject, to such evidently relevant aspects as national income, age distribution, and ethnic relations. Another limitation lies in the fact that only the post-1962 conditions will be discussed, since the data necessary for an analysis of the previous periods are missing in whole or in part.

§ 6.3.1. THE EFFECT OF THE POPULATION GROWTH ON PER CAPITA INCOME

At least two questions are involved in any search for relationships between population growth and economic development. These are the nature of the interaction between the two phenomena, and the ideological implications of a slowdown in population growth. There are two

theoretical positions about the first aspect. Some scholars (Enke 1966: 46-56, Ohlin 1967: 120) argue that a decline in population growth must result in a rise in per capita income. Their reasoning is summarized in Table 68 (Brand 1970; see also Enke 1966: 46-50). Table 68 represents

TABLE 68

The Effects of the Birthrate on Per Capita Income in 1963 and 1968, Compared to the Hypothetical Effect of Family Planning

	1963	1968	
		Without Reduction	With. .5 % Reduction
Birthrate per 1000	46.5	37.1	32.1
Population Growth per 1000	38.1	23.5	18.5
Population Size	292,205	375,312	373,624
Actual G.N.P. (In Sf millions)	150	264.9	264.9
Per Capita Income (In Sf)	466.8	705.8	709.0
Per Capita Income Growth (in %)	4.4	3.1	3.6

the increase in per capita income under two sets of circumstances: one with, the other without population controls. The left hand column under 1968 shows the situation as it actually developed. Had the birth rate declined by 5 per 1000 as the result of birth control, a situation would have developed as shown in the right hand column under 1968. Per capita income would have increased by 0.5 %. The costs of this additional decline in the birth rate by 0.5 % may be estimated as follows. If the postulated decline had indeed taken place, then the number of unborn children would be 1688 (5 per 1000 of the population in 1968). Since the costs per unborn child may be set at Sf 18 (Enke figured it at $ 10), the total demanded investment for the realization of the additional decline in the birth rate, and therefore of the increase in per capita income would be equivalent to Sf 30,384. In other words, had an additional Sf 151,920 been invested in family planning between 1963 and 1968, then per capita income would have risen by 0.5 %. The question is, how large would the investment have to be under traditional economic planning in order to realize this same increase in

per capita income? To raise the national income by Sf 750,000 (0.5 % of Sf 150,000,000), a capital coefficient of 3 requires an investment of Sf 2,250,000. According to this reasoning, then, it is clear that economic development through family planning requires less of an investment than do the approximations based upon traditional planning techniques.

A number of theorists object to this assumption that birth control must have a positive influence on economic growth. The following points have been made:

1. The prevention of the birth of a child is profitable only if its future contribution to the national income (his labor productivity) is less than the cost of his education and consumption (Keyfitz 1970: 145). It must be noted here that for the agrarian sector of various poor countries, birth control would probably have positive effects because in such sectors marginal labor productivity is low.
2. For many underdeveloped areas, it cannot be assumed that any savings will be realized because of what was not consumed by the potential family member whose birth was prevented. It is far more likely that the average consumption per member of the family will increase. For the lower income groups in Surinam this is indeed quite probable, just as, for instance, in India (Simon 1969: 62, 67).
3. In general, it is the higher income groups with their relatively higher labor productivity who most frequently practice birth control, while the very persons whose productive marginality approaches zero are likely to reject family planning. Thus the "non-marginal births" tend to be more effectively curtailed than the births which contribute little to the national income (Leibenstein 1969: 162, 164).
4. According to economists such as Kuznets (1966: 80 ff; see also Leibenstein 1969: 65; 1971: 1937; Lloyd 1969: 466), the contribution of capital and labor to the national income is minor in comparison with such non-standard inputs as education, technical development, and management capacities.
5. Finally, it is debatable whether measures designed to limit the birth rate can be successful unless the population has achieved a certain level of material welfare and intellectual development (van Praag 1966: 108; Sauvy 1963: 231; 1966: 208 ff; Wertheim 1971: 392-394).

When the Surinam material is viewed against this background of opinions on population growth and economic development, the following observations are in order. It is clear that in the period of rapid population growth, 1953-1964, the increase in per capita income was

TABLE 69

The Economic Growth of Surinam, 1953-1968

	Absolute			Growth expressed in Percentages		
Year	Actual G.N.P.* in Millions of 1953 Sf	Population Size**	Actual per Capita G.N.P. (in Mill. Sf)	Actual G.N.P.	Population	Per Capita Income
1953	100.5	220,020	456.7			
1958	126.4	264,513	477.8	4.4	3.5***	0.9
1963	150.0	321,302	466.8			
1964	161.2	333,515	483.3			
1965	186.9	344,740	542.1	15.9	3.3****	12.6
1966	229.9	355,962	645.8	23.0	3.2	19.8
1967	257.0	366,252	701.7	11.8	2.8	9.0
1968	264.9	375,312	705.8	3.1	2.4	0.7

* Source: Stichting Planbureau Suriname, 1971.
** Includes Bush Negroes and Indians, interpolated and extrapolated (1950 and 1964 Censuses).
*** Average yearly growth 1953—1964.
**** Computed on the basis of the figures for 1964.

small. This does not, however, justify the conclusion that a decline in population growth during that period would have led to a greater increase in per capita income. Factors such as those mentioned by Leibenstein and Lloyd must be taken into consideration before a scientifically defensible conclusion can be reached about the effects of birth control on economic development.

The division of opinion does not halt with the problem of the relationship between population and economic growth. Controversy exists also on the ideological implications of population control. Leftist and nationalist circles deny the necessity of population control. It has not been established that a braking of the population increase, and therefore of the labor force, will result in more than a temporary reduction in unemployment. This could lower the level of social protest against a status quo under which the necessary social and political changes remain absent. As the result of such a contingency, the level of unemployment would rise again. On these grounds, the predominantly left-wing groups in Surinam demand changes in its actual socio-economic structure, instead of what they refer to as palliatives. It needs to be emphasized that they do not deny the right of each individual

to practice birth control. They point only to the ideological aspect of family limitation, and therefore object to the governmentally-financed project to limit population growth.

While leftist groups generally take the position that birth control serves primarily capitalist interests and is not in the long range interest of Surinam, liberal-conservative individuals are inclined to embrace the idea that present savings from a possible accelerated economy may be employed as the basis for future socio-economic development. In order to achieve this accelerated growth and its associated savings, a braking of population growth is desirable. Virtually the same ideological controversy about the relationship between population growth and economic development has been noted by Gonzalez (1971: 45, 46) for Latin America.

§ 6.3.2. THE EFFECTS OF POPULATION GROWTH ON THE WORKING POPULATION

This section endeavors to describe the development of the labor-productive age group in the 1962-1970 period. Table 70 shows that the number of persons aged 15-64 increased from 134,391 in 1963 to 164,090 in 1970. This relatively large absolute and relative increase in the size of the working population — especially between 1963 and 1968, when it averaged 4589, or 3.1 % per year — is one of the causes that the Surinam government failed to reach its goals regarding employment in the 'Sixties. When the Development Plan of 1965 was drawn up, it assumed that the working population, and the labor-productive age group, would increase by an average 2.7 % per year (Stichting Planbureau Suriname 1965: 744, 745). This assumption rested on a rectilinear extrapolation of the growth percentages observed from 1950 to 1964. No account was taken of the fact that the high rate of population increase which marked the end of the 'Fifties must have had some effect on the size of the labor-productive group in the 'Sixties. This shows the danger of plans based upon estimates of future population growth in the working sector. This observation is valid if we overlook the accelerated increase in the size of the working population in the first phase of the plan period. The remark remains apt even if hindsight should show that, for the complete plan period, the average yearly growth percentage had not been exceeded.

Besides the underestimation of the increase in the labor force for the Nineteen-Sixties, other factors contributed to the discrepancy between goals and realization in the employment situation. One of these factors

TABLE 70

Growth of the Productive Age Group, 15-64

Dec. 31 of Year	Number	Increase	
		Numerical	Per 100C
1963	134,391	—	—
1964	138,575	4184	30.6
1965	142,785	4210	29.9
1966	147,203	4418	30.4
1967	152,618	5415	36.1
1968	157,340	4722	30.4
1969	161,159	3819	23.9
1970	164,090	2931	18.0

was the excessively optimistic estimate of the number of jobs to be created as the result of development projects. It appears likely that too advantageous an employment multiplier was chosen to arrive at this estimate. I will not here enter the argument as to the applicability of the concept "employment multiplier" in the formation of a development plan. An integral development plan may presuppose that the secondary (indirect) effects on employment are discounted in the plan in the form of such factors as the influence of supply companies. This is different from situations in which obvious business cycles take place such as those of the economic Depression in the Netherlands during the 'Thirties (Hegeland 1954; Polak 1937: 18, footnote 3). For Surinam as a whole, an employment multiplier of 1.5-2.0 was used (Essed 1971: 33). Since it has been demontrated for several Western countries that an induction of 0.7, thus an employment multiplier of 1.7, must be maintained (Meganck 1959: 96; Polak 1937: 18), it is self-evident that a ratio of 1.5-2.0 for Surinam with its less developed structure is unrealistically high. In this context it may be noted that the advancement of additional demands for labor is related, among other factors, to an increase in the demand for domestically produced consumer goods. But for the Surinam economy it appears that the opposite took place, that the loss of purchasing power, of money from circulation, played a role. This occurred (occurs) for instance in the importation of consumer goods and the loss of profits made in Surinam to other countries by corporations based outside of

the country. On the basis of these factors, the number of jobs created by the various development schemes must have been less than anticipated.

For Jamaica a multiplier of 2.0 has also been employed in the manufacturing sector (Lewis 1951: 32). Jamaica enjoys an approximately equivalent labor productivity ratio to Surinam in the area of bauxite, that is, 1000 ton capita per year (Girvin 1967: 31; Stichting Planbureau Suriname 1971). On this basis we may assume that for Surinam also, the employment multiplier would be 2.0 for the manufacturing sector. On these grounds also, a ratio of 1.5-2.0 for the whole country must be judged as too high.

But not only for the total country was an obviously too favorable multiplier used for induced employment opportunity. The estimates for the jobs created by the bauxite industry also appear to be unrealistic. For this sector the assumption was made that the factor for indirect employment would be 2.0 (Stichting Planbureau Suriname 1971: 160). This means that the number of additional jobs created would be twice as great as those in the primary employment, and that the total employment effect of the bauxite sector would thus be a factor of 3.0. If we accept that the multiplier of 1.5-2.0 for Surinam as a whole was too high, then the same logic holds for the factor of 3.0 employed for the bauxite sector of the economy.

After all, the ratio for the country as a whole is composed out of ratios for different sectors.

There are other reasons why the multiplier must be considered too high for the Surinam bauxite sector. It is understood that multiplier effects are created not only through the increased demand for locally produced consumer goods which results from (high) wages. Activities in connection with supply companies also contribute to the area of indirect employment. It must be assumed that these — primarily Surinamer — companies have been of very slight importance since most of the goods required by the bauxite industry were imported. The associated supply companies therefore also had but negligible effect on the creation of secondary job opportunities.

It may be noted in this context that a probably too favorable employment multiplier used in the 'Sixties has led to optimistic estimates of the number of jobs that would be created by the carrying out of development projects. Partly as a result of this, the goal of employment as it was formulated in the Development Plan of 1965 has not reached. On the contrary, unemployment has actually increased.

A third factor contributed to the disappointing results in employment.

This is a hidden unemployment which, since the 'Sixties, has been converted into work-seeking. The opening of Surinam's hinterland has increased the urban economic and socio-cultural influences upon the population of Surinamers living in rural areas. Partly as the result of this urbanism, urbanization has increased greatly (Anderson 1964: 2-4, 21-23). In this fashion the hidden unemployment of the agrarian Districts (which lie in the coastal area) and of the hinterland has been transformed into a demand for employment which could not be completely satisfied by the newly-created jobs. Urbanization itself is thus also in part the result of an overestimation of the possibilities of finding work in Paramaribo.

The combined effect of the three aforementioned factors — underestimation of the growth in the labor supply, excessively favorable values for the employment multiplier, and urbanization — is closely related to the strong surge of unemployment in the 'Sixties, and therefore with the failure to realize Surinam's employment goals. Both the growth of the labor-productive group and increased urbanization are in part effected through population increase. On the basis of the decline in population growth since 1962, it may therefore be expected that the growth of the working population will decrease in the 'Seventies. A decline has already been noted for 1969 and 1970.

Besides population pressure, another factor played a role in urbanization. This is the (probably unplanned) "demonstration effect" of the life style of the prosperous segment of the urban populace, which creates new expectations and new needs among the lower-income groups in Paramaribo and the agrarian Districts. Among the latter the impression has been created that these new desires could only be satisfied in Paramaribo. Partly because of this, the pulling power of Paramaribo will probably continue to affect migration in the foreseeable future, and will not further the achievement of an acceptable employment situation. Thus, in spite of the fact that the emigration of laborers to the Netherlands reduces the population pressure somewhat, the expected growth in urban unemployment, coupled with the possibilities which the unions hold out for better wages, may very well increase social tensions in Surinam for the coming period.

A quite different aspect of the development of the labor-productive group concerns the dependency ratio: the number of persons in the non-productive consuming groups aged 0-14 and 65 and over, expressed in percentages of the productive category aged 15-64. The dependency ratio increased sharply between 1963 and 1966, and then began a

TABLE 71

The Dependency Ratio

Dec. 31 of year	Age Group in Absolute Numbers			Age Group in Percent Population			Dependency Ratio: Age Groups 0—14, 65+, 0—14 and 65+ expressed in percentages of the category aged 15—64		
	0—14	15—64	65+	0—14	15—64	65+	0—14	65+	0—14 and 65+
1963	138,121	134,391	11,372	47.7	46.4	3.9	102.7	8.4	111.1
1964	145,009	138,575	11,460	48.2	46.1	3.8	104.6	8.2	112.8
1965	150,849	142,785	11,549	48.5	45.9	3.7	105.6	8.0	113.6
1966	156,410	147,203	11,676	48.7	45.9	3.6	106.2	7.9	114.1
1967	160,126	152,618	11,676	48.5	46.2	3.5	104.9	7.6	112.5
1968	163,152	157,340	11,795	48.3	46.5	3.4	103.6	7.4	111.0
1969	166,395	161,159	11,826	48.2	46.7	3.4	103.2	7.3	110.5
1970	168,374	164,090	11,895	48.1	46.9	3.4	102.6	7.2	109.8

decline. This may be interpreted to mean that, regardless of the increase in the labor producing category in the pre-1967 period, a comparatively large and increasing number of "non-producers" was dependent upon the producing group. This pressure by the consumers on the producers was especially noticeable for the 0-14 year category, while that of the elderly has declined (see table 71).

That the demographic pressure of consumers on producers is quite heavy in an underdeveloped country such as Surinam, is seen in a comparison with developed areas. The dependency ratio in the Netherlands in 1949 was only 46 for children and no more than 12 for elders, while for the combined care-requiring categories (children plus aged) it amounted to 63 (Wiardi Beckman Stichting 1955: 42-45).

Nevertheless, one is not totally justified to draw conclusions in demographic terms about the pressure exerted on the producing age groups by the young and the aged, because different relative weights must be given to the consumer-capacities of people in different life stages. Unfortunately there are no data on this subject for Surinam, nor for the countries with which Surinam has been compared in this study. It is obvious that the consumer capacities of the members of a group are a function of their life style. For this reason Surinam and the Netherlands are also not comparable.

In order to gain at least a very general impression of the consumer capacities of people of different ages, the data for two Western countries follow. For England, Bowley puts the consumption of persons between the ages of 16 and 70 at 100 (Beveridge 1930: 461-463). On this basis he computes values of 33, 50, and 60, respectively for the age groups 0-5, 5-14, and Over 70. For the age group 14-16, the value for males is 85, that for females is 80. For the Netherlands, figures on consumptive power have been calculated by Steigenga (1939: 11) on the basis of data supplied by Stridiron. These deviate somewhat from Bowley's results. "All males over the age of 15 must be considered as fullgrown consumers (= 1), all females over the age of 15 are thought to possess a consumer capacity equivalent to 0.9 that of the males. Children's consumption appears to be equivalent to 0.6 that of males" [Original in Dutch]. In spite of these relatively minor differences between the data for these two countries, it may be concluded that the effect of the elderly on the income of the productive age groups is greater than that of the young.

If we assume that the heavy demographic pressure with which the young and the elderly bear upon the reproductive age categories of

Surinam means that their effect on income must also be considerable, then the following observations are in order. The effect of the care-requiring age categories over the entire period has been quite considerable, in comparison with developed countries. This is seen in the high dependency ratios of the 1963-1970 period. That the pressure began to decline in 1967, implies a relative increase in the labor-producing group. It is not unlikely that the relative growth of this group contributed to the increase in unemployment in the 'Sixties. As a general observation it may be added that this kind of stress could lead, under certain circumstances, to great national exertions. But because the pressure was relieved, at least in part, by the *emigration* of Surinamers (mostly to the Netherlands), the question of the degree to which such national exertions are possible in the Surinam population must remain unanswered.

Apart from lowering the population pressures, emigration's age-selectivity contributed to the aging of the working population. This may be deduced from the figures supplied in the chapter on emigration. This aging must result in the near future in an increase of the pressure (by the no longer productives) upon the productive age group.

§ 6.3.3. THE EFFECTS OF POPULATION GROWTH ON EDUCATION

In the area of education, the results of population pressure are also noticeable. The growth was accompanied by a great increase in the number of school children, which contributed to the rising government expenditure.

The number of pupils rose from 94,276 in 1963 to 140,446 in 1970 (see Table 72). This is equivalent to a mean yearly growth of 6595, or 6.6 % in relative terms. If the growth rate is computed from year to year, it is not regular. In general terms it would appear that the yearly percentual increase has declined since 1963 as a result of the slow-down in population growth. In spite of this, however, the costs of education have increased fairly steeply between 1963 and 1970, from S*f* 10,000,000 to S*f* 30,000,000. This is an average yearly growth of 15.5 %. As Table 72 indicates, the total cost of education amounted to about 7.8 % of the gross national product (G.N.P.). This percentage remained virtually constant for successive years.

When the number of students is expressed as a percentage of the school-age category (that aged 5-19), we note that the actual number increased from 87.5 to 96.7 % during the years 1963 and 1970. These percentages are partly based upon the number of students in special

TABLE 72

Growth of the Number of Students and of the Cost of Education

31 Dec. of Year	Students *			Cost of Education to students **			Total Cost of Education Increase Per 100	Total Cost of Education in percentages of G.N.P.***
	Number	Increase		Number	Increase			
		Numerical	Per 100		Numerical	Per 100		
1963	94,276			10,574,690				8.0
1964	104,503	10,227	10.2	11,751,440	1,176,750	11.1	8.5	8.1
1965	112,956	8,453	7.7	12,052,046	300,606	2.5	10.7	7.7
1966	—	—	—	13,784,302	1,732,256	14.3	23.1	7.7
1967	121,522	8,566	7.3	17,520,000	3,735,698	27.1	14.5	7.9
1968	127,281	5,759	4.6	16,920,000	—600,000	— 3.4	0.0	7.7
1969	133,537	6,256	4.7	20,525,000	3,605,000	21.3	27.8	
1970	140,446	6,909	5.0	33,802,950	13,277,950	64.6	29.7	
Mean yearly growth of		6,595	6.6			15.5	16.3	

* Source: Budget of the Ministry of Education and the GOS. The number of students refers to the following types of schools: Kindergarten, Elementary Schools, Secondary Schools, Teacher Colleges, Vocational Education, Restricted Elementary Education (for Bush Negroes and American Indians).

** Source: Budget of the Ministry of Education and financial accounts.

*** Against factor costs, holding the 1953 price levels as a constant.

teacher colleges because it was not possible to eliminate this category from the raw data for all the years on which information was gathered. But the point is not the exact height of the percentage, in any case. The participation-coefficients are meant only to represent the increase in the number of students in comparison with the growth of the number of persons aged 5-19. The coefficients in reality are lower than the ratios given in Table 73. The coefficients do show, however, that the number of school-going individuals is increasing more rapidly than

TABLE 73

Growth of the School-Going Age Group, of 5-19 Year olds

31 Dec. of Year	Number	Increase		Number of Students expressed as a Percentage of the School-age Category
		Numerical	Per 100	
1963	107,722	—	—	87.5
1964	114,046	6324	5.7	91.6
1965	119,240	5194	4.4	94.7
1966	124,886	5646	4.6	—
1967	130,680	5794	4.5	92.9
1968	135,286	4606	3.4	94.0
1969	141,094	5808	4.2	94.6
1970	145,171	4077	2.8	96.7
Mean yearly growth of		5349	4.2	

the school-age category. This again appears to be a function of migration from the rural districts, with their relative scarcity of schools, to Paramaribo and its environment, which are centers with many educational institutions. Given the steadily increasing urbanization and its accompanying settlement of the rural populations in the neighborhood of schools, it must be assumed that the participation-coefficients for education will rise still further.

§ 6.3.4. THE EFFECTS OF POPULATION GROWTH ON POLITICAL RELATIONSHIPS

The numerical positions of the ethnic groups have also been affected by the increase in population between 1962 and 1970. As mentioned earlier, the groups developed at different rates, affecting the balance

of political power in Surinam, which is based upon ethnicity. This is evidenced in the voting results of successive elections for parliament. It must be emphasized that ethnic relationships are determined not merely by demographic components as such, but also by the image which the group members hold about the development of differential population growth.

For example, as explained in a previous section, the birth rates of the three ethnic groups began to converge in the 'Sixties. Many Creoles, not aware of this development, assumed that the high growth rate of the Hindustani population during the 'Fifties would continue, and that it heralded a quantitative majority of the Hindustani in the near future. The resulting fear among some Creoles that their group would eventually become a minority, added to the willingness of Creoles to emigrate, especially to the Netherlands. Since it is especially the young adults who emigrate, the birth rate and the rate of natural increase of this group have dropped more sharply than would have happened in the absence of the high migration rate. This "self fulfilling prophecy" (Merton 1968) illustrates just how pointless it is to base ethnic relations and future socio-economic development on assumptions of the numerical representation of the ethnic groups. Laymen's interpretations of past trends may lead to unnecessary worries.

An analogous application of the concept of the "self fulfilling prophecy", but one concerning the power relationships between Protestants and Catholics in the Netherlands, is found in van Heek's study of Dutch Roman Catholics (1954: 152, 153).

The foregoing indicates that there were real political implications to the differential demographic development by ethnic group in the past. Since 1972, after the provisional results of the Fourth General Population Census of December 1971 were published, this aspect of population growth has again become a topic of discussion. The census showed that the Creoles are no longer the largest group in Surinam, that their number has been surpassed by that of the Hindustani. An occasional individual questions these results, but it is worth noting that criticisms of the census do not concern the actual size of the population, but the numerical differences between the ethnic groups.

It cannot be denied that the ethnic factor affects group behavior. Nevertheless, on the basis of our research we are left with the impression that the relative importance of this factor is overestimated, while the influence of more salient factors remains largely ignored. For example, the economic contrasts between the rich and the poor within any given

ethnic group are probably responsible for class distinctions which could further the development of an inter-ethnic stratification. The following section will investigate the possibility that there are already some signs that this postulated inter-ethnic socio-economic group formation is taking place.

Table 74 shows that the Creoles in 1964 were the most represented group in the administrative sector and in industry, that the Hindustani were over-represented in the agrarian sector and in trade, and that the Javanese generally farm or work in industry. These data do not give any indication of class formation, but are meant to indicate how the ethnic groups were distributed across the occupational spectrum. This distribution is used as the point of departure for the changes which occurred after 1964.

Since the beginning of the 'Sixties, important adjustments have taken place in the predominantly ethnic-oriented structure of the economically active population. The high birth levels of the Nineteen-Forties and 'Fifties especially increased the population in the agrarian Districts and occupational groups. The increase in job-seekers was augmented by the disclosure of the hidden unemployment in the interior. For a portion of the agrarian sector, employment opportunities were created by the development of modern agricultural projects. This was done both in the form of land parceled out to individual farmers, and in the construction of large agro-businesses in which young farmers were employed as agricultural laborers. The latter united in labor unions such as the Jarikaba Werknemers Bond (Jarikaba Employees Union) whose members work at the Jarikaba concern in District Suriname, which produces bananas. Another trade union which organizes agricultural workers is the Bacoven Werknemers Bond Nickerie (Banana Employees Union Nickerie), which counts among its members persons employed in a variety of concerns in District Nickerie.

The agricultural development projects could only absorb a portion of the population increase in the agrarian sector. The rest has left the rural areas to seek work in Paramaribo's industry. These migrants also have united into labor organizations. Since there are Hindustani and Javanese among the people who migrate to Paramaribo and join unions, the predominantly Creole character of the city's unions is being replaced by an inter-ethnic composition.

The awareness of their shared interests, which result from their more or less equivalent socio-economic position, has contributed greatly to the development of an inter-ethnic solidarity among the laborers. This

awareness has developed most among the urban industrial unions, as the result of the mixed ethnic composition of the labor force there. On the other hand, the farm-labor organizations have an ethnically homogeneous character, because in certain agrarian areas one ethnic group is usually greatly over-represented. In spite of this, the members of these unions are increasingly motivated by considerations which focus upon socio-economic interests.

Another factor which gave impetus to group formation is the decline in solidarity which farmers and laborers feel towards members of their own ethnic groups who belong to the commercial class. On the basis of this and the aforementioned trends, it is safe to state that the importance of the ethnic factor is diminishing when compared to the influence of socio-economic factors.

Illustrations of this tendency are found in a number of labor unions. A prime example is the Billiton Mijnwerkers Bond (Mine Workers Union). The Billiton Corporation produces and exports bauxite, Surinam's principal export product. It employs about 1500 persons, many of whom belong to the Union. The membership is primarily Creole and Javanese, with a Hindustani minority. Nevertheless, the leader of this union is neither Creole nor Javanese, but a Hindustani. During the recent election he was chosen to be the president of the union for the second consecutive time. This means that the employees did not vote according to the ethnic sentiments.

The decrease in ethnic solidarity is also demonstrated in labor strikes against employers who belong to the same ethnic group as the strikers. For example, the members of the Jarikaba Employees Union are almost exclusively of Hindustani extraction, but for a considerable time they have had a Creole attorney and labor leader as advisor. Some years ago a strike broke out among the employees of this (semi) governmental undertaking. This in effect represented a conflict with the government in which the Hindustani Party, led by its founder Lachmon, holds a strong position. This demonstrates that oppositions are beginning to develop within the ethnic group. Furthermore, the choice of a Creole advisor for the union in this conflict indicates that the laborers' socio-economic interests outweighed their ethnic affiliation.

The foregoing shows that there are, indeed, indications of a growing inter-ethnic solidarity among Surinam laborers. This new fellowship, as mentioned earlier, resulted in part from the population growth of the 'Forties and 'Fifties, the opening of the interior, and urbanization.

Although there are indications of growing inter-ethnic solidarity, there

are also some developments which may interfere with the formation of a class system. The first factor is the continual increase in unemployment, which may sharpen ethnic oppositions. And in the area of education, developments have taken place which have led to *verzuiling* along religious and ethnic lines, "the tendency for religious (and ethnic) blocs or "pillars" to penetrate into institutions of a nonreligious character" (Goudsblom 1967: 50). In view of the structure of Surinam education, these trends were to be expected. Further research is needed to determine how these and other conditions will develop in the future.

For Guyana and Trinidad, countries which are comparable to Surinam, the following may be noted. The impression here is that, in the areas of class formation and *verzuiling,* similar trends exist as in Surinam (Cross 1971: 490; Malik 1971: 60, 61; Smith 1971: 421, 422, 426; and Appendix V).

It was the purpose of this section to point out some of the indicators of the growing inter-ethnic solidarity and *verzuiling* in Surinam. They are mentioned here because they are related to such factors as population growth and urbanization. Guyana and Trinidad are mentioned only as potential support for my view on Surinam, which must be considered to be impressionistic. It may therefore be useful to pursue comparable investigations on the results of population growth in all three of these countries.

TABLE 74

The Working Population by Occupational Category, Ethnic Group, and Sex, per 1000 Inhabitants, March 31, 1964

	Creole		Hindustani		Javanese	
	M	F	M	F	M	F
Scientific, Managerial, and Administrative	24.2	43.7	10.0	5.8	5.8	5.9
Business and Insurance	3.1	6.4	8.4	14.3	2.8	12.8
Agriculture, Cattle Raising, and Fishing	7.3	3.7	38.5	60.3	39.5	50.4
Mining, Industry, and Transportation	56.1	18.3	38.5	5.2	47.3	11.3
Service	7.6	36.8	3.1	7.2	2.5	18.4
Unclassified	1.7	1.1	1.5	1.7	1.1	1.2
Total	100.	100.	100.	100.	100.	100.

Source: The Third General Population Census of 1964, table 23.

SAMENVATTING

De wijze waarop de differentiatie der bevolkingsbeweging in de verschillende etnische groepen zich sinds 1951 heeft voltrokken en de faktoren welke met dit proces samenhangen, vormen het onderwerp van een demografisch-sociologisch onderzoek dat tussen mei 1969 en april 1971 in Suriname werd verricht. Hierbij werd nagegaan wat de relatieve bijdrage is geweest van de vier demografische componenten — fertiliteit, mortaliteit, immigratie, emigratie — tot de bevolkingsgroei.

In de hoofdstukken 2.1 en 2.2, 3, 4 en 5 worden respectievelijk de ontwikkeling van de geboorte, de ontwikkeling van de sterfte en de ontwikkeling van de migratie behandeld. Tevens is nagegaan in hoeverre de ontwikkeling van geboorte en sterfte verklaard kunnen worden door faktoren zoals de leeftijd waarop de procreatie begint, de leeftijdsopbouw van de bevolking (geboorte), en de doodsoorzaken (sterfte). Langs deze weg is naar een verklaring gezocht voor de bevolkingsgroei en de componenten daarvan. Tevens is t.a.v. de fertiliteit regressie-analyse toegepast, teneinde de variantie van het vruchtbaarheidscijfer tussen de telgebieden te kunnen vergelijken met die van de overige variabelen. Deze zijn o.a. de bevolkingsdichtheid, de agrarische beroepsbevolking, de godsdienst, de etnische afkomst. De hoofdstukken over de immigratie en de emigratie dragen in hoofdzaak een historisch-beschrijvend karakter, wegens het ontbreken van voldoende gegevens die een statistisch meer verfijnde behandeling van deze onderwerpen mogelijk maken.

Het bij dit onderzoek gebruikte materiaal is verkregen uit zelf verzamelde statistische gegevens, en wel i.h.b. aan de hand van archieven en uit lopende registers van geboorte, van sterfte, van immigratie en van emigratie. Deze gegevens zijn — evenals het censusmateriaal van de volkstellingen van 1950 en 1964 — op hun betrouwbaarheid getoetst. Hierbij is gebleken dat de gebruikte gegevens als betrouwbaar mogen worden beschouwd.

Wat de ontwikkeling van het geboortecijfer gedurende de laatste vijftig jaar betreft, kunnen drie fasen worden onderscheiden. De eerste fase waarin het geboortecijfer vrijwel onveranderd bleef, duurde van 1923

tot 1943 en werd gevolgd door een stijgende tussen 1943 en 1962. Daarna heeft zich een daling ingezet.

Landen met een min of meer overeenkomstige sociaal-economische struktuur als Suriname n.l. Guyana en Trinidad, vertonen een vrijwel analoge eveneens uit drie fasen bestaande trend van het geboortecijfer.

Gebleken is dat de geboortestijging tussen 1943 en 1962 in feite een stijging is van de fertiliteit. Deze is mede veroorzaakt door het gezamenlijke effect van de in het bijzonder in de jaren veertig en vijftig genomen maatregelen ter bestrijding van bepaalde ziekten en de verbetering in de curatieve geneeskundige dienst. Hieraan kan de conclusie worden verbonden dat de "lage" geboortecijfers in de jaren twintig en dertig d.w.z. vóór de stijging van 1943, ten dele moet worden verklaard uit het feit dat de toepassing van bedoelde maatregelen vóór genoemd jaar minder intensief is geweest als in de periode daarna. De na 1962 opgetreden daling van het geboortecijfer is eveneens een verandering van de fertiliteit geweest, die vermoedelijk samenhangt met de toepassing van geboortebeperking welke na 1960 in toenemende mate een rol is gaan spelen.

De voor het land geconstateerde trend van het geboortecijfer — een stijgende fase, ingezet na de Tweede Wereldoorlog en gevolgd door een dalende, begonnen na 1960 — geldt ook voor de etnische groepen. Verder valt op dat het geboorteniveau van de Hindoestanen hoger ligt dan dat van de Creolen en de Javanen. Hoewel de Creolen over het algemeen hogere geboortecijfers hebben dan de Javanen, is het proces van geboortedaling de laatste jaren voor de Creoolse groep zó intensief geweest, dat deze sinds 1962 de laagste geboortecijfers vertoont.

Het hoge geboorteniveau van de Hindoestanen blijkt niet typisch Surinaams te zijn. Ook in andere landen waar de Hindoestanen een naar verhouding grote bevolkingsgroep vormen, ligt hun geboortecijfer over het algemeen hoger dan dat van de andere etnische groepen.

De hoge fertiliteit bij de Hindoestanen hangt o.a. samen met de voor deze groep kenmerkende gezinsstruktuur en de sociaal-religieuse organisatie. Deze sociaal-religieuse struktuur is ten dele een uitdrukking van het streven een hogere sociaal-economische positie te krijgen. De lage fertiliteit van de Javanen moet in verband worden gebracht met de t.a.v. het geboortecijfer ongunstige sex ratio, welke bij hen langer heeft doorgewerkt dan bij de Hindoestanen. Het lage geboorteniveau van de Creolen is ten dele veroorzaakt door het onstabiele gezinstype dat voor vele leden van deze groep kenmerkend is, en waarschijnlijk ook door de na 1962 opgetreden veranderingen in de sex ratio.

Bij toepassing van regressie-analyse is gebleken dat Nederlands als hoofdtaal, landbouw en bevolkingsdichtheid de drie "belangrijkste" verklarende variabelen zijn t.a.v. het vruchtbaarheidscijfer. En daar het Nederlands de hoofdtaal is voor i.h.b. de hogere inkomensgroepen van Suriname, is aangenomen dat de invloed van sociaal-economische faktoren op de variantie van de fertiliteit groter is dan de relatieve bijdrage van de etnische en de religieuse variabelen. Deze conclusie zou als een aanvulling worden beschouwd op de langs de weg van historische analyse verkregen resultaten m.b.t. de oorzaken van de geboorte-ontwikkeling in de jaren zestig. In het betreffende hoofdstuk is immers opgemerkt dat de geboortedaling welke zich na 1962 heeft ingezet waarschijnlijk samenhangt met het eveneens na dit jaar toegenomen gebruik van anticonceptionele middelen. Deze via historische analyse geconstateerde oorzaak, hangt samen met de toegenomen verstedelijking en de procentuele daling van de agrarische beroepsbevolking. En daar beide faktoren de variantie in de fertiliteit mede verklaren, mag worden gesteld dat de via beide methoden verkregen resultaten elkaar ondersteunen.

Helaas is het niet gelukt de veronderstelling over de relatieve bijdrage van de variabelen te toetsen.

Het sterftecijfer van Suriname is tussen 1923 en 1970 sterk gedaald. Wordt — terwille van de vergelijking — de bij de ontwikkeling van de geboorte gebruikte indeling in drie fasen aangehouden, dan blijkt dat de daling van het sterftecijfer tussen 1923 en 1943 iets sterker is geweest dan zowel in de periode 1943-1962 als tussen 1962 en 1970.

Landen met een min of meer overeenkomstige sociaal-economische struktuur als Suriname n.l. Guyana en Trinidad, vertonen een analoge dalende trend van het sterftecijfer.

Gebleken is dat ongeveer 25 % van alle sterfgevallen voor rekening komt van het gezamenlijke effekt van de vijf volgende doodsoorzaken: longontsteking, congenitale malformaties en ziekten van de eerste jeugd, kwaadaardige gezwellen, gastritis en gastero-enterities, infectie- en parasitaire ziekten. Deze ziekten hebben tussen 1920 en 1970 voor ruim 30 % bijgedragen tot de daling van het algemene sterftecijfer.

De dalende trend welke geconstateerd is voor het algemene sterftecijfer geldt ook voor het sterftecijfer der etnische groepen. Tevens is gebleken dat m.b.t. de sterfte de Creolen en de Hindoestanen over het algemeen even hoge cijfers hebben, terwijl de Javanen over het geheel genomen m.u.v. de jaren veertig hoger liggen dan de beide andere groepen.

Het is niet eenvoudig na te gaan wat de oorzaken zijn van het verschil in sterfteniveau der etnische groepen. Dit als gevolg van het ontbreken van medisch-sociologische onderzoekingen. Toch kan worden opgemerkt dat het hoge sterfteniveau der Javanen vermoedelijk samenhangt met hun geringe medical-mindedness en het feit dat zij oververtegenwoordigd zijn in de agrarische sektor.

De demografische betekenis van de immigratie blijkt tussen 1923 en 1970 althans wat de remigratie betreft, niet erg groot te zijn geweest. Tevens is geconstateerd dat de differentiële immigratiecijfers naar geslacht nauwelijks van elkaar verschillen. Daarentegen blijken tussen de etnische groepen wèl duidelijke verschillen te bestaan, althans voor de periode na 1963. Hetzelfde geldt m.b.t. de leeftijdsgroepen.

Wat de emigratie betreft valt een duidelijke schommeling van de vertrekcijfers te constateren tussen 1923 en 1950. Voor de periode na 1962 is een opmerkelijke stijging waar te nemen van de trek i.h.b. naar Nederland. Als oorzaak hiervan moet in de eerste plaats de steeds stijgende werkloosheid in Suriname worden genoemd.

De toename van de emigratie in de jaren zestig geldt zowel voor de beide geslachten, voor de drie etnische groepen, als voor de diverse leeftijdsgroepen. Ook hierbij zijn differentiële verschillen geconstateerd, naar etnische groep en naar leeftijdscategorie. De verschillen naar geslacht zijn te verwaarlozen.

De bevolking van Suriname is in de afgelopen vijftig jaar bijna verviervoudigd. T.a.v. het jaarlijkse groeipercentage kunnen in grote lijnen drie fasen worden onderscheiden. De eerste fase (1922-1943) wordt gekenmerkt door een "lage" gemiddelde jaarlijkse groei. Tijdens de tweede periode welke van 1943 tot 1962 heeft geduurd, is het groeicijfer zeer hoog geweest. Daarentegen heeft zich na 1962 een daling ingezet.

De relatieve bijdrage van de drie etnische groepen tot de bevolkingsgroei van Suriname is zeer verschillend geweest. Over de gehele periode bekeken is de bevolkingsgroei van de Hindoestanen het sterkst geweest.

De groei van de bevolking in de jaren zestig heeft duidelijke gevolgen gehad o.a. voor de omvang van het arbeidsaanbod en het aantal kinderen van de schoolgaande leeftijdsgroep.

APPENDIX I

DATA COLLECTION

The sections labeled § 1.4.1, § 1.4.2, and § 1.4.3 gave detailed explanations of the materials used in this research, tested their reliability, and indicated some of the problems encountered in data collection.

A problem which was not mentioned concerns the difficulties encountered in demographic research in underdeveloped countries as compared with developed areas. For example, while in the latter such basic information as birth, death, and migration are available for demographic analysis, in the underdeveloped countries the researcher must collect these data personally before the analysis can be begun. This was also unavoidable in my research.

It was necessary to collect various demographic data among the governmental-services located in the nine Districts of Surinam. As a result of the need to travel the considerable distances and primitive connections between the capitals of some of these Districts, the collection of the basic materials generated considerable difficulties. In some of the Districts there were special problems associated with the collection of migration data, both between Districts and in regard to foreign countries. For a number of years there simply were no registers for movement into and out of these Districts. As a result, there was a hiatus in the data on internal and external immigration and emigration. The lack of this information could have had consequences for the statistics to be computed, such as population size, age distribution, sex ratio, fertility, mortality and migration figures. This is true not only for the particular District involved, but for Surinam as a whole. For this reason it was decided to employ the extremely time consuming and boring solution of "unraveling" the civic records. As part of this task, thousands of cards were examined one by one in order to trace the migration history of persons over a series of years. In this fashion it became possible to ascertain for various persons if and when they had left or entered the district, and what their district or country of origin or destination was.

Only after this "analysis" was completed was it possible to reconstruct the unavailable registers for the years in question. Then the real work,

the collection of migration data from the existing and the reconstructed registers, could begin. At the end of this stage, the data were taken to Paramaribo in coded form, and there the actual analysis of the information was begun.

APPENDIX II

COMPUTING THE AGE-ACCURACY INDICES

TABLE 75

Computation of the Age-Accuracy Index for Surinam, 1963

Age Group	Population		Sex Ratio		Age Ratio, Male		Age Ratio, Female	
	Male	Female	$\frac{M}{F} \times 100$	Successive Difference	Ratio	Deviation from 100	Ratio	Deviation from 100
0— 4	28,904	27,699	104.3					
5— 9			100.1	4.2	98.3	1.7	102.3	2.3
10—14			103.8	3.7	99.4	0.6	96.1	3.9
15—19			100.7	3.1	95.1	4.9	94.7	5.3
20—24			94.3	6.4	88.0	12.0	91.1	8.9
25—29			93.3	1.0	97.9	2.1	99.1	0.9
30—34			94.6	1.3	104.8	4.8	95.8	4.2
35—39			98.1	3.5	100.4	0.4	98.8	1.2
40—44			99.4	1.3	97.5	2.5	95.8	4.2
45—49			96.9	2.5	88.0	12.0	93.5	6.5
50—54			107.8	10.9	115.8	15.8	100.9	0.9
55—59			90.2	17.6	91.0	9.0	103.1	3.1
60—64			94.2	4.0	95.3	4.7	96.5	3.5
65—69			103.1	8.9	115.5	15.5	105.9	5.9
70—74								
Sum				68.4		86.0		45.4
Mean (Sum/13)				5.2		6.6		3.4

Index (3 x Sex Score + Age Score Males + Age Score Females) = 25.8; or 18.8 after correction.

TABLE 76

Computation of the Age-Accuracy Index for the Creole Population, 1963

Age Group	Population		Sex Ratio		Age Ratio, Male		Age Ratio, Female	
	Male	Female	$\frac{M}{F} \times 100$	Successive Difference	Ratio	Deviation from 100	Ratio	Deviation from 100
0— 4	10,837	10,380	104.4					
5— 9			101.0	3.4	101.9	1.9	106.1	6.1
10—14			106.2	5.2	100.3	0.3	95.7	4.3
15—19			102.2	4.0	98.9	1.1	98.3	1.7
20—24			92.9	9.3	83.8	16.2	85.6	4.4
25—29			83.7	9.2	92.9	7.1	100.2	0.2
30—34			87.3	3.6	101.7	1.7	100.4	0.4
35—39			89.0	1.7	101.6	1.6	102.8	2.8
40—44			93.6	4.6	101.3	1.3	97.7	2.3
45—49			92.0	1.6	97.2	2.8	97.2	2.8
50—54			90.1	1.9	102.5	2.5	97.4	2.6
55—59			78.0	12.1	99.5	0.5	108.0	8.0
60—64			77.4	0.6	99.1	0.9	101.6	1.6
65—69			81.6	4.2	94.7	5.3	81.9	18.1
70—74			60.8	20.8	98.3	1.7	116.4	16.4
Sum				82.2		44.9		71.7
Mean (Sum/13)				6.3		3.4		5.5

Index (3 x Sex Score + Age Score Males + Age Score Females) = 27.9; or 17.9 after correction.

TABLE 77

Computation of the Age-Accuracy Index for the Hindustani Population, 1963

Age Group	Population		Sex Ratio		Age Ratio, Male		Age Ratio, Female	
	Male	Female	$\frac{M}{F} \times 100$	Successive Difference	Ratio	Deviation from 100	Ratio	Deviation from 100
0— 4	12,393	11,985	103.4					
5— 9			99.4	4.0	97.0	3.0	100.5	0.5
10—14			102.3	2.9	97.9	2.1	95.8	4.2
15—19			101.5	0.8	96.3	3.7	94.0	6.0
20—24			93.6	7.9	90.9	9.1	97.0	3.0
25—29			97.4	3.8	98.8	1.2	97.4	2.6
30—34			99.6	2.2	99.4	0.6	98.9	1.1
35—39			101.6	2.0	101.0	1.0	101.3	1.3
40—44			105.5	3.9	94.8	5.2	90.0	10.0
45—49			98.2	7.3	104.6	4.6	113.9	13.9
50—54			109.4	11.2	89.0	11.0	85.1	14.1
55—59			118.4	9.0	102.9	2.9	98.4	1.6
60—64			120.7	2.3	97.9	2.1	100.6	0.6
65—69			140.1	19.4	78.8	21.2	73.3	26.7
70—74			153.0	12.9	104.4	4.4	110.0	10.0
Sum				89.6		72.1		95.6
Mean (Sum/13)				6.8		5.5		7.3

Index (3 x Sex Score + Age Score Males + Age Score Females) = 33.2; or 23.2 after correction.

TABLE 78

Computation of the Age-Accuracy Index for the Javanese Population, 1963

Age Group	Population		Sex Ratio		Age Ratio, Male		Age Ratio, Female	
	Male	Female	$\frac{M}{F} \times 100$	Successive Difference	Ratio	Deviation from 100	Ratio	Deviation from 100
0— 4	4,299	4,075	105.4					
5— 9			101.3	4.1	94.3	5.7	97.8	2.8
10—14			104.4	3.1	100.2	0.2	95.6	4.4
15—19			96.5	7.9	83.9	16.1	88.6	11.4
20—24			98.1	2.6	91.3	8.7	91.0	9.0
25—29			98.9	0.8	104.5	4.5	102.4	2.4
30—34			96.0	2.9	118.4	18.4	125.0	25.0
35—39			105.2	9.2	96.8	3.2	88.5	11.5
40—44			96.9	8.3	92.2	7.8	99.3	0.7
45—49			102.1	5.2	40.4	59.6	48.4	51.6
50—54			144.6	42.5	232.0	132.0	139.4	39.4
55—59			79.8	64.8	65.9	34.1	101.3	1.3
60—64			99.2	19.4	86.5	13.5	84.6	15.4
65—69			110.7	11.5	176.9	76.9	188.1	88.1
70—74			164.6	53.9	73.7	26.3	52.3	47.7
Sum				236.2		407.0		310.7
Mean (Sum/13)				18.1		31.3		23.9

Index (3 x Sex Score + Age Score Males + Age Score Females) = 109.5; or 93.5 after correction.

TABLE 79

Computation of the Age-Accuracy Index for Surinam, 1950

Age Group	Population		Sex Ratio		Age Ratio, Male		Age Ratio, Female	
	Male	Female	$\frac{M}{F} \times 100$	Successive Difference	Ratio	Deviation from 100	Ratio	Deviation from 100
0— 4			102.7					
5— 9			99.8	2.9	96.4	3.6	98.8	1.2
10—14			101.7	1.9	100.7	0.7	98.1	1.9
15—19			98.1	3.6	103.6	3.6	103.2	3.2
20—24			92.2	5.9	91.6	8.4	94.5	5.5
25—29			90.8	1.4	105.2	5.2	105.5	5.5
30—34			89.3	1.5	84.8	15.2	88.9	11.1
35—39			97.6	8.3	104.4	4.4	96.7	3.7
40—44			91.7	5.9	102.0	2.0	104.3	4.3
45—49			89.3	2.4	91.8	8.2	102.4	2.4
50—54			110.3	21.0	111.4	11.4	102.5	2.5
55—59			120.1	9.8	95.6	4.4	91.8	8.2
60—64			123.0	2.9	113.0	13.0	104.8	4.8
65—69			105.1	17.9	96.9	3.1	102.6	2.6
70—74								
Sum				85.2		83.2		56.9
Mean (Sum/13)				6.5		6.4		4.3

Index (3 x Sex Score + Age Score Males + Age Score Females) = 30.4; or 22.4 after correction.

TABLE 80

Computation of the Age-Accuracy Index for the Creole Population, 1950

Age Group	Population		Sex Ratio		Age Ratio, Male		Age Ratio, Female	
	Male	Female	$\frac{M}{F} \times 100$	Successive Difference	Ratio	Deviation from 100	Ratio	Deviation from 100
0— 4			103.0					
5— 9			100.6	2.4	96.0	4.0	97.3	2.7
10—14			100.6	0.0	100.6	0.6	96.9	3.1
15—19			92.4	8.2	104.7	4.7	104.5	4.5
20—24			81.4	11.0	89.0	11.0	96.0	4.0
25—29			81.4	0.0	103.2	3.2	102.6	2.6
30—34			80.2	1.2	90.7	9.3	92.0	8.0
35—39			81.2	1.0	105.0	5.0	101.0	1.0
40—44			75.6	5.6	99.8	0.2	98.7	1.3
45—49			67.3	8.3	93.6	6.4	108.2	8.2
50—54			80.6	13.3	105.8	5.8	92.4	7.6
55—59			74.9	5.7	94.4	5.6	96.0	4.0
60—64			70.8	4.1	107.1	7.1	107.9	7.9
65—69			67.0	3.8	104.9	5.1	101.9	1.9
70—74								
Sum				64.6		68.0		56.8
Mean (Sum/13)				4.9		5.2		4.3

Index (3 x Sex Score + Age Score Males + Age Score Females) = 24.4; or 11.4 after correction.

TABLE 81

Computation of the Age-Accuracy Index for the Hindustani Population, 1950

Age Group	Population		Sex Ratio		Age Ratio, Male		Age Ratio, Female	
	Male	Female	$\frac{M}{F} \times 100$	Successive Difference	Ratio	Deviation from 100	Ratio	Deviation from 100
0— 4			103.8					
5— 9			98.1	5.7	98.8	1.2	102.9	2.9
10—14			99.9	1.8	98.5	1.5	98.6	1.4
15—19			103.0	3.1	99.9	0.1	97.7	3.3
20—24			102.2	0.8	90.4	9.6	90.4	9.6
25—29			101.0	1.2	109.6	9.6	109.0	9.0
30—34			98.0	3.0	92.5	7.5	96.9	3.1
35—39			105.6	7.6	96.8	3.2	94.2	5.8
40—44			111.0	5.4	99.3	0.7	96.0	4.0
45—49			110.2	0.8	96.1	3.9	104.6	4.6
50—54			136.4	26.2	90.4	9.6	86.3	3.7
55—59			167.2	30.8	85.6	14.4	81.4	8.6
60—64			181.4	14.2	160.0	60.0	147.3	47.3
65—69			166.6	14.8	80.1	19.9	84.9	15.1
70—74								
Sum				115.4		141.2		118.4
Mean (Sum/13)				8.8		8.6		9.1

Index (3 x Sex Score + Age Score Males + Age Score Females) = 44.3; or 30.3 after correction.

TABLE 82

Computation of the Age-Accuracy Index for the Javanese Population, 1950

Age Group	Population		Sex Ratio		Age Ratio, Male		Age Ratio, Female	
	Male	Female	$\frac{M}{F} \times 100$	Successive Difference	Ratio	Deviation from 100	Ratio	Deviation from 100
0— 4			99.7					
5— 9			98.7	1.0	90.0	10.0	94.1	5.9
10—14			107.1	8.4	105.9	5.9	98.0	2.0
15—19			99.6	7.5	109.0	9.0	113.5	13.5
20—24			99.6	0.0	102.4	2.4	101.5	1.5
25—29			96.9	2.7	101.3	1.3	102.0	2.0
30—34			92.5	4.4	52.4	47.6	61.6	38.4
35—39			123.6	31.1	116.6	16.6	88.6	11.4
40—44			94.4	29.2	110.2	10.2	126.7	26.7
45—49			98.3	3.9	80.5	19.5	91.5	8.5
50—54			128.2	29.9	138.3	38.3	134.3	34.3
55—59			164.1	35.9	103.7	3.7	93.3	6.7
60—64			220.1	56.0	84.7	15.3	62.1	37.9
65—69			155.7	64.4	109.8	9.8	139.6	39.6
70—74								
Sum				274.4		189.6		228.4
Mean (Sum/13)				21.1		14.5		17.5

Index (3 x Sex Score + Age Score Males + Age Score Females) = 95.4; or 76.4 after correction.

APPENDIX III

SEX RATIOS

TABLE 83

Sex Ratios at Birth, $(\frac{M}{F} \times 100)$ 1923—1960

Year	Ratio
1923	109 *
1924	99
1925	105
1926	107
1927	103
1928	104
1929	99
1930	107
1931	99
1932	101
1933	104
1934	105
1935	100
1936	99
1937	98
1938	101
1939	104
1940	104
1941	100
1942	98
1943	99
1944	99
1945	106
1946	109
1947	101
1948	107
1949	99
1950	100
1951	102
1952	107
1953	106
1954	102
1955	103
1956	101
1957	102
1958	99
1959	104
1960	103

* Ratios are rounded off: Over .5 becomes 1.

TABLE 84

Correction Factor Applied to the Sex Ratios at Birth

Year	Number of Births	Theoretical Number Male Babies *B*orn	Reliability Interval $B = \sqrt{n}$	$\sqrt{n}$
1923	3464	1773.5	1714.7—1832.3	58.8
1924	3836	1964.0	1902.1—2025.9	61.9
1929	4331	2217.4	2151.6—2283.2	65.8
1931	4166	2132.9	2068.4—2197.4	64.5
1932	4186	2143.2	2078.6—2207.8	64.6
1935	4806	2460.6	2391.3—2529.9	69.3
1936	4536	2322.4	2255.1—2389.7	67.3
1937	4524	2316.2	2249.0—2383.4	67.2
1938	4514	2311.1	2244.0—2378.2	67.1
1941	5140	2631.6	2560.0—2703.2	71.6
1942	5159	2641.4	2569.6—2713.2	71.8
1943	5145	2634.2	2562.5—2705.9	71.7
1944	5346	2737.1	2664.0—2810.2	73.1
1946	6098	3122.1	3044.1—3200.1	78.0
1947	5983	3063.2	2985.9—3140.5	77.3
1949	6473	3314.1	3233.7—3394.5	80.4
1950	6863	3513.8	3431.0—3596.6	82.8
1956	10106	5176.2	5075.7—5276.7	100.5
1958	11180	5726.3	5620.6—5832.0	105.7

TABLE 85

Sex Ratios of the Total Population $(\frac{M}{F} \times 100)$, by Ethnic Group, 1922-1970

Dec. 31 of Year	Ethnic Group			
	Creole	Hindustani	Javanese	Country
1922	89.2	127.3	138.9	101.0
1923	88.1	129.0	143.0	101.4
1924	87.3	126.6	141.8	101.5
1925	88.5	124.8	135.5	101.1
1926	86.8	123.3	133.3	100.4
1927	86.6	121.9	131.7	100.1
1928	85.8	120.8	132.9	100.4
1929	85.6	118.7	130.9	99.7
1930	85.5	118.1	129.7	99.4

Dec. 31 of Year	Ethnic Group			
	Creole	Hindustani	Javanese	Country
1931	85.6	118.0	128.2	99.3
1932	85.6	117.7	126.7	99.1
1933	85.6	117.8	124.7	99.1
1934	86.1	117.4	124.3	99.1
1935	86.4	115.4	123.3	98.7
1936	86.5	114.6	121.6	98.4
1937	87.8	111.5	120.0	97.7
1938	87.3	110.4	119.5	96.9
1939	88.0	110.8	121.9	98.4
1940	89.9	108.5	119.2	98.4
1941	89.4	108.0	118.7	98.0
1942	89.6	107.4	117.6	97.8
1943	89.9	111.0	116.0	97.9
1944	90.7	106.6	115.5	96.6
1945	89.6	107.9	117.9	96.9
1946	89.7	107.9	117.3	97.2
1947	90.0	107.4	115.6	96.9
1948	90.8	106.0	114.9	97.0
1949	93.0	107.0	113.9	98.5
1950	86.7	105.5	108.2	98.3
1951	87.1	104.9	107.7	98.2
1952	87.8	104.6	107.4	98.3
1953	88.6	104.3	106.4	98.3
1954	89.1	104.0	106.0	98.3
1955	89.7	103.8	105.2	98.3
1956	90.1	103.4	104.9	98.3
1957	90.5	102.8	104.4	98.2
1958	90.8	102.2	104.2	98.0
1959	91.3	102.1	103.8	98.1
1960	91.7	101.9	103.3	98.1
1961	—	—	—	98.2
1962	—	—	—	98.1
1963	95.2	101.9	104.3	99.8
1964	95.3	101.3	103.4	99.5
1965	95.5	101.0	103.3	99.4
1966	95.5	101.0	102.7	99.4
1967	95.9	101.1	102.5	99.5
1968	96.1	100.9	102.1	99.4
1969	96.3	100.8	101.8	99.4
1970	96.4	100.4	101.5	99.3

APPENDIX IV

COMBINING THE CENSUS TRACTS

Census tracts, the geographic subdivisions of a District, were used in this investigation only in section § 2.3, in the explanation of fertility on the basis of a number of variables. The number of population entities in some tracts is so small that they did not justify the application of statistical manipulations, nor conclusions based thereon. To solve this problem, two or more census parcels which together produced the requisite number of entities — 100 women aged 15-44 — were combined into a single new tract. According to Derksen it is not necessary that the tracts to be combined actually border on each other, but for practical purposes here, an effort was made to combine only neighboring census parcels. In this way the original number of census tracts was reduced from 255 to 138.

The following Tables give an overview of which tracts have been combined. Their location and the numbers associated with their names are drawn on the master chart of census tracts which was compiled by the Office of Rural Development (Bureau Landelijke Opbouw) in Paramaribo. This map is available in the library of the Institute for Planology and Demography of the University of Amsterdam, the Netherlands.

TABLE 86

Combinations of Census Tracts in District Nickerie

Number	Name of Tract	Combined with:
1.	2e Stalweide	
2.	Nannipolder	3, 5, 7, 11, 15, 19, 20, 23, 24
3.	Gebied ten Zuiden	see 2
4.	Clarapolder	
5.	1e Stalweide	see 2
6.	Corantijnpolder	
7.	Het gebied t. n. van de Corantijn- en van Drimmelenpolder	see 2
8.	Van Drimmelenpolder	
9.	Waldeck	
10.	Sidoredjo	
11.	Margarethenburg	see 2
12.	Nieuw Nickerie	
13.	Polder achter Nieuw Nickerie	
14.	Waterloo (Nursery, Hazard)	
15.	Karang Anjar	see 2
16.	Longmay	
17.	Paradise en uitbreiding	
18.	Sawmillkreekpolder (Boonackerpolder)	
19.	Uitbreiding Hamptoncourtpolder	see 2
20.	Prins Bernhardpolder	see 2
21.	Hamptoncourtpolder	
22.	Groot Henarpolder	
23.	Henarpolder	see 2
24.	Gebied ten Zuiden van de Nickeriepolder	see 2
25.	Het dorp Wageningen	
26.	Wageningenpolder	

TABLE 87

Combinations of Census Tracts in District Coronie

Number	Name of Tract		Combined with:
1.	Burnside		
2.	Sarah Leasowes	07	06, 05
3.	Clyde, Salem		
4.	Klein en Groot Novar		
5.	Johanna Maria	06	see 07
6.	Belladrum		
7.	John		
8.	Bantaskin	05	see 07
9.	Friendship		
10.	Vestigingsplaats Totness	04	
11.	Soemboredjo		
12.	Waterschap noordelijke Coroniepolder		
13.	Zuid-Westelijk deel van Mary's Hope		
14.	Cocospolder		
15.	Zuid-oostelijk deel van Mary's Hope		
16.	Bellevue	03	02, 01
17.	Cadrospark		
18.	Perseverance		
19.	Zuid-westelijk deel van Moy		
20.	Oost Moy		
21.	Hague		
22.	Welgelegen		
23.	Hamilton	02	see 03
24.	Inverness		
25.	Ingikondre		
26.	Coppename	01	see 03

TABLE 88

Combinations of Census Tracts in District Saramacca

Number	Name of Tract	Combined with:
1.	Hildesheim-Huwelijkszorg	
2.	Antonigron-Bombay	3, 4
3.	Dankbaarheid	see 2
4.	La Prévoyance	see 2
5.	Broederschap	6-11
6.	Volharding	see 5
7.	Sara Maria	see 5
8.	Markshoop - Jameskreek	see 5
9.	Voorzorg-Maatschappij	see 5
10.	Frederiks Gift-Goede verwachting	see 5
11.	Jarikabakreek	see 5
12.	Het geb. ten zuiden van de Erfpachtspercelen aan het Garnizoenspad	
13.	De erfpachtspercelen aan het Garnizoenspad	14-17
14.	Het gebied aan de Atlantische Oceaan	see 13
15.	Vissersdorp Coppename	see 13
16.	Het voorlopige gebied t/n van de Coesewijne	see 13
17.	Carl Francois	see 13
18.	Het voorlopige gebied t/w van de Tijgerkreek	
19.	De Calcuttapolder	
20.	Het voorlopige gebied t/n westen van Groningen	
21.	Groningen	22-24 + 26-28
22.	Het voorlopige gebied rond Dirkshoop	see 21
23.	Het vorlopige gebied t/z van de Grankreek	see 21
24.	La Poule	see 21
25.	Het voorlopige gebied rond Gravenstein	
26.	Weerzijde van de Saramacca riv. omvattende de dorpen Groningen, Land Petronella, dam Para, Lokuskreek, Bigi Poika, Moeroekreek tot Saramacca	see 21
27.	Kalebaskreek en omgeving	see 21
28.	Dorpen langs de Coppename-riv. en Tibitiriv.	see 21

TABLE 89

The Census Tracts of District Paramaribo *

* The 38 census parcels of Paramaribo were not combined.

TABLE 90

Combinations of Census Tracts in District Suriname

Number	Name of Tract	Combined with:
1.	Erfpachtspercelen a. d. Rijweg Uitkijk	3, 4
2.	Creola	
3.	Stalweide	see 1
4.	Geb. t/z v. d. Uitkijkpolder	see 1
5.	Uitkijkpolder	
6.	Koewarasan	12, 13
7.	Geb. t/w v. d. Rijweg Koewarasan	
8.	Leiding 5. en omgeving	
9.	Santozwamp	
10.	Geb. t/z v. h. Saramaccakanaal	
11.	Geb. t/n v. h. Saramaccakanaal	
12.	Erfpachtspercelen t/n v. d. Noordelijke polderdam v. d. Saramaccapolder	see 6
13a.	Zuid Kasabaholoweg	see 6
13b.	Zuid Kasabaholo	see 6
14.	Geb. t/z v. d. Kwattaweg en het Garnizoenspad	
15.	Geb. t/n v. h. Garnizoenspad	
16.	Geb. rondom polder Weg naar Zee	17, 18 + 23-26
17.	Polder Weg naar Zee	see 16
18.	Geb. t/o v. d. Fernandesweg	see 16
19.	Geb. t/n v. d. Kwattaweg	
20.	Geb. t/z v. d. Kwattaweg	
21.	Geb. t/w van Paramaribo	
22.	Geb. t/w v. d. Charlesburgweg	
23.	Complex Tourtonnelaan	see 16
24.	Geb. t/n van Ma Retraite	see 16
25.	Geb. a/d Atlantische Oceaan	see 16
26.	Leonsberg, Purmerend	see 16
27.	Clevia	
28.	Morgenstond	29, 41, 44, 45, 48, 50
29.	Geyersvlijt	see 28
30.	Blauwgrond	
31.	Ma Retraite	
32.	Noord Beekhuizen	
33.	Zuid Beekhuizen	
34.	Geb. t/w v. d. Spoorbaan	
35.	Welgedacht C weg Oost	
36.	Welgedacht C weg West	
37.	Bomazwamp	
38.	Welgedacht B en omgeving	
39.	Mon Plaisir en omgeving	
40.	Livorno	
41.	Bethesda, Suhosa	see 28
42.	Dijkveld	
43.	Tout Lui Faut	

Number	Name of Tract	Combined with:
44.	Plantage Tout Lui Faut	see 28
45.	Het Vertrouwen	see 28
46.	Houttuin	
47.	Vredenburg	
48.	Altona	see 28
49.	Oost Lelydorp	
50.	Lelydorp	see 28
51.	West Lelydorp	
52.	Lelydorpplan uitgezonderd kavels a/d Sawariweg	56, 59, 61, 62
53.	Geb. t/z van Bernharddorp	
54.	Mijngeb. t/w van de Pararivier	
55.	Mijndorp Billiton Mij	
56.	Mijngeb. t/z van Paranam	see 52
57.	Paranam	
58.	Smalkalden	
59.	Mijngeb. t/o van Pararivier	see 52
60.	Accaribo	
61.	Simonspolder	see 52
62.	Waterland	see 52
63.	Adrichem	67, 69-71
64.	La Recontre	
65.	Domburg	
66.	Boxel	
67.	La Resource	see 63
68.	Ornamibo	
69.	Merveille	see 63
70.	Maagdenburg	see 63
71.	Laarwijk	see 63
72.	Vreeland	73, 74, 76
73.	Petersburg	see 72
74.	Blijendaal	see 72
75.	Peperpot, La Liberté	
76.	Meerzorg	see 72

TABLE 91

Combinations of Census Tracts in District Brokopondo

Number	Name of Tract	
1.	Auka tot Moederz. + omgeving	The 8 census tracts of District Brokopondo were combined into a single statistical entity.
2.	Berg en Dal, Maotapoe, Dempada en omgeving	
3.	Klaaskreek tot Remoncourt en omgeving	
4.	Brokopondo en Hermansdorp	
5.	Brokobaka, Suralcokondre, Balin, Moekoekondre en omgeving	
6.	Afobaka	
7.	Kwakoegron en omgeving	
8.	Bronsweg en omgeving	

TABLE 92

Combinations of Census Tracts in District Commewijne

Number	Name of Tract	Combined with:
1.	Jagtlust	
2.	Dordrecht	3, 4
3.	Lust en Rust	see 2
4.	Belwaarde-Voorburg (Suzanna's Daal Clevia)	see 2
5.	Nieuw Amsterdam	
6.	Vestiging Voorburg	8
7a.	Mariënburg	
7b.	Geb. t/z van Mariënburg	
8.	Leliëndaal	see 6
9.	Visserszorg	10, 12, 13, 14
10.	Zorgvliet	see 9
11.	Alkmaar	
12.	Nijd en Spijt	see 9
13.	Mon Tresor	see 9
14.	Welgelegen	see 9
15.	Katwijk	16, 17, 18, 19, 22, 23, 24
16.	Wederzorg	see 15
17.	Vriendsbeleid, Ouderzorg	see 15
18.	Spieringshoek	see 15
19.	Tyronne	see 15
20.	Geb. t/w v. d. Orleanakreek	
21.	Tamanredjo	
22.	Geb. t/n v. d. Pauluskreek	see 15
23.	Geb. t/o v. d. Orleanakreek	see 15
24.	Weltevreden	see 15
25.	Akkerboom	26, 27, 28
26.	Nieuwgrond	see 25
27.	Slootwijk	see 25
28.	Geb. rond Pomona	see 25
29.	Pieterszorg	
30.	Einde Rust (Rust en Werk)	31, 32
31.	Johannesburg	see 30
32.	Maasstroom	see 30
33.	Berlijn	34, 36, 37, 38, 42-45
34.	Elizabethshoop	see 33
35.	Johanna Margaretha	
36.	Frederiksdorp	see 33
37.	Guadeloupe	see 33
38.	Marienbosch	see 33
39.	Kronenburg	
40.	Brouwerslust	
41.	Nut en Schadelijk	
42.	Killenstein	see 33
43.	Mon Souci	see 33

Number	Name of Tract	Combined with:
44.	't Vertrouwen	see 33
45.	Campenburg	see 33
46.	Storkoe	47
47.	La Singularité	see 46
48.	Zorg en Hoop	
49.	Picardie	50-55
50.	Welgevallen	see 49
51.	Purmerend	see 49
52.	Klein Bellevue	see 49
53.	Saphier	see 49
54.	Constantia	see 49
55.	Nieuw Meerzorg	see 49
56.	Bakki	
57.	Reynsfort	58-68
58.	Corneliasburg	see 57
59.	Geb. t/n v. d. plantages a/d rechter Commewijnerivier	see 57
60.	Geb. rond de Warappa en Matapica	see 57
61.	Alliance	see 57
62.	Geb. rond het Tapoeripakanaal	see 57
63.	Geb. t/w v. d. Commetewane	see 57
64.	Post Sommelsdijck, Vossenburg	see 57
65.	Weerszijden v. d. Commewijnerivier	see 57
66.	Geb. ten weerszijden v. d. Boven Commewijne ten zuiden van Potribo	see 57
67.	Weerszijden v. d. Boven Commewijne van Killenstein tot Rozenbeek	see 57
68.	Weerszijden v. d. Boven Commewijne van Rozenbeek uit t/m Sapende en het strook-land omvattende de dorpen gelegen a/d Cassewinica monding t/m Quapibo	see 57

TABLE 93

Combinations of Census Tracts in District Marowijne

Number	Name of Tract	Combined with:
1.	Geb. rondom Moengo	
2.	De plaats Moengo	
3.	Geb. rondom Albina	
4.	De plaats Albina	

APPENDIX V

CLASS FORMATION AND ETHNIC DIVISIONS

In Chapter VI some indications were given that both class formation and *verzuiling* are increasing in Surinam. The impression exists that similar developments are taking place in Guyana and Trinidad. To bolster this belief some citations from publications about these countries follow. An article by Smith (1971: 421, 422) indicates that urbanization and the changes in social stratification which accompany it, have significantly contributed to political conflicts, here expressed as ethnic hostilities.

Today the situation is greatly changed and is still changing. The proportion of mixed, Portuguese, and white in the urban population has dropped to 21 per cent, 4 per cent, and 1 per cent respectively. Africans still make up about half the urban population as before, but the proportion of Indians had increased to more than 22 per cent in 1960 and much more than that now. These changing proportions of the various races living in the urban area is less interesting than their shifting positions in the occupational status scale, and the kinds of anxieties and jealousies this has caused. Georgetown has always been an administrative and commercial centre, and as I have said before there is still practically no manufacturing industry. High status employment is to be found mainly in the professions and in the public service, and because the public service is most immediately sensitive to political pressure, it has been the battleground on which wars for individual and group advancement were fought against what was thought to be prejudice, favouritism, or in local terminology - "advantage". First the mixed group had to fight against the British preference for bringing in Englishmen for top positions rather than appointing a local man. They joined cause with Africans in the demand for Guyanization and with the imminent granting of independence this battle was won. But it soon became apparent that Indians also were knocking at the door, and while many vacancies in some branches of the civil service were left unfilled there seemed to be several aspirants for every promotion and appointment that was actually made, and many of these contests revolved around race and the supposed party sympathies of the candidates. I stress these jealousies and struggles for preferment and advancement because they have been part of the factionalism of all the new West-Indian elites. In Jamaica

too, there have been charges of political interference and a pervasive feeling that if you are not favoured by the party in office you will not get on, though Jamaica has a much larger population and more avenues for mobility because of its more complex economy. In Guyana the factionalism was expressed in terms of race more than party affiliation, though by the late fifties the two were thought to be practically synonymous. In the 1950s the Africans felt particularly threatened by the growing numbers of Indians who were moving up in the civil service or being appointed to the government medical and legal services. No doubt some of this fear was justified in terms of the more rapid advancement given to P.P.P. party supporters, but part of it was simply an unwillingness to recognize that Indians were no longer an uneducated minority of rural sugar workers and rice farmers.

Guyana has two major political parties, the People's Progressive Party and the People's National Congress. The overwhelmingly Hindustani P.P.P. is lead by Jagan, a Hindustani. The P.N.C. is led by Premier Burnham, a Creole, and counts its adherents primarily among the Creoles. The opposition party, P.P.P., is clearly left-wing oriented. The above quoted article by Smith shows that even in these ethnically-differentiated political parties, class tensions are possible.

The racial issue has clearly obscured some very significant differences in class orientation in the policies of the two parties. Whereas Dr. Jagan's People's Progressive Party has frequently had difficulty in retaining the support of Indian businessmen and professionals, Mr. Burnham's party will find it increasingly difficult to hold the loyalty of the urban lower class as the policies of the party operate against their interests (Smith 1971: 426).

A no less actual example of conflicting interests within one ethnic group is offered by Trinidad. Here the Creoles have a numerical majority, while the Hindustani minority forms the opposition. The development of a middle class composed of both Negroes and Hindustani presumably led to conservatism in Trinidad society. Furthermore, in 1970 attempts were made to unite Negroes and Hindustani in a struggle against colonialism. As Cross recently wrote:

It is impossible to understand the recent historical changes within Trinidad without looking at economic forces. For one thing the presence of comparatively large and prosperous black, coloured and Indian middle class has established a tradition of conservatism and has, incidentally, led to a greater disjunction between racial and economic divisions. The events of 1970, though they may be termed "Black Power", have much more in common with the riots of 1937, when also an attempt

was made to unite Africans and Indians in opposition to colonialism, than they do to the drive for nationalism and political independence, with its inevitable polarization overrace, which characterized the period after the granting of adult suffrage in 1945. Further there are significant disjunctions along ethnic lines within racial groups. To talk of an "East-Indian cultural section" is to ignore or minimize the role that Moslem Indians have played in the black nationalist movement. Certainly, the process of acculturation has added to this complexity, for Christian Indians have been far more successful than Hindus in professional and entrepreneurial roles. It would not be entirely unreasonable to base an argument accounting for the paucity of good leadership among the Indians in Trinidad on the divisions following from this religious and economic disjunction with purely racial identity (Cross 1971: 490).

That economic factors influence ethnically-based political relationships is also indicated by the results of an investigation among Trinidad Hindustani in 1971. To the question of what they thought was the best solution to the race problem in Trinidad, 51 % of the "East-Indian elites" answered: "Equal opportunity for East-Indians" (Malik 1971: 60, 61). It is also important to note that among the Hindustani it is especially businessmen who advocate cooperation with the ruling Creole political party.

ABBREVIATIONS

AA	American Anthropologist
AER	American Economic Review
CA	Current Anthropology
CER	Caribbean Economic Review
EDCC	Economic Development and Cultural Change
EJ	Economic Journal
EPC	European Population Conference
IPC	International Population Conference
JDS	Journal of Development Studies
JG	Journal of Geography
KNAW	Koninklijke Nederlandse Akademie van Wetenschappen
MM	Mens en Maatschappij
MMFQ	Milbank Memorial Fund Quarterly
NWIG	Nieuwe West Indische Gids
PAPS	Proceedings of the American Philosophical Society
PI	Population Index
PS	Population Studies
SES	Social and Economic Studies
SWJA	Southwestern Journal of Anthropology
TKNAG	Tijdschrift van het Koninklijk Nederlands Aardrijkskundig Genootschap
VG	Vox Guyanae
WPC	World Population Conference

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INDEX

E

F

G

P

R

S

T

U

V

W

Z

LEGENDA.

- Karaïben.
- Arowakken.
- Wajand's of Aloekojana's.
- Trio's.
- Wajarikoele's.
- Aucaners.
- Paramaccaners.
- Bonnis of Aloekoes.
- Saramaccaners.
- Matoewari's.
- Kwinti's.

- Stuwmeer bestaand.
- Stuwmeer geprojecteerd.
- Vliegveld.
- Distrikt grens.
- Land grens.

Stuwmeer bestaand:	Lake
Stuwmeer geprojecteerd:	Projected lake
Vliegveld:	Airfield
Distrikt grens:	District boundary
Land grens:	Boundary