

GOKHALE INSTITUTE OF POLITICS AND ECONOMICS

Publication No. 18

106

**The Social Survey of Kolhapur City
Part 1—Population and Fertility**

By

N. V. Sovani,

Assisted by the Staff of the Institute

Price, Rs. 4 or 8s.

1948

Published by D. R. Gadgil, M.A., M.Litt. (Cantab.), for the Gokhale Institute of
Politics and Economics, Poona 4, and printed by L. C. Shepard, at the Oriental
Watchman Publishing House, Salisbury Park, Poona 1. 1,000—3566-48.

FOREWORD

THE survey, the first volume of whose report is now being published, was initiated by a letter from the Kolhapur Municipal Borough inviting the Institute to undertake the work. At the time the invitation was received (December 1944) the Institute was facing its chronic problem of shortage of experienced staff. It could not, therefore, undertake to depute a member of its staff to Kolhapur as it had done when conducting the survey at Sholapur. The Institute, therefore, suggested the following plan of work to the Borough authorities. "The Institute would plan the survey, would supervise the work at all stages, would tabulate the data and would write the final report. The Institute will not, however, open a separate office at Kolhapur but will work through the Kolhapur Municipal Borough. A separate agency will have to be set up by the Kolhapur Municipal Borough itself for this purpose. The Institute would undertake to advise in the setting up of this agency and the recruitment of its staff, would lay down the complete details of the plan of field work and would send a member of its research staff, say, once a month to Kolhapur to supervise the conduct of this work." This plan of work proved acceptable to the Kolhapur Municipal Borough and was, in the main, adhered to in its actual conduct.

The investigational establishment in Kolhapur was set up in June 1945 and its work finally wound up in March 1947. Mr. N. V. Sovani was in full charge of the work of the survey through all its stages and will be also responsible, in the main, for the reports. He has been assisted on the statistical side by Mr. V. M. Dandekar, Statistician of the Institute. The Chief Investigator at Kolhapur was Mr. W. C. Shrishrimal. As pointed out above, the survey was initiated by the Kolhapur Municipal Borough. The President and Councillors of the Borough and all important officers of the Borough evinced considerable interest and gave active help in the various investigational projects. The Kolhapur Durbar also extended to the survey its active sympathy. Above all, from the inception to its completion, the survey owes a great deal to Mr. J. P. Naik who was Hon. Secretary of the Reorganization Department, Kolhapur Municipal Borough, when the work was conceived, and was Development Secretary of Kolhapur Government when the work at Kolhapur was ended.

This publication represents the first volume of the report of the third socio-economic survey of an urban area in Maharashtra undertaken by the Institute. The full reports of the two previous surveys have not yet been published. Of the Poona Survey only one of the two projected volumes has been published and the Sholapur Survey is represented by the monograph on the Hand-Loom Weaving Communities and Industry. The full plan of the surveys conducted by the Institute has not so far appeared in print. The introduction to Volume I of the Poona Survey gives a brief sketch of the aims and methods of these urban surveys of the Institute. In many ways the investigations at Kolhapur followed the plan of the work at Poona and Sholapur. We were, however, somewhat more fortunately circumstanced at Kolhapur. Not only had the Institute gathered more experience and was thus able to avoid many mistakes by the time of the Kolhapur Survey but also more active local help was available at Kolhapur and this made it possible to extend in important directions the scope of the Survey.

One such direction was that of a fertility survey. At its very start the investigational work at Kolhapur was able to attract the attention and sympathy of a group of women social workers. With the help of this group we were able to educate public opinion and arouse sympathy with our objective to an extent which made it possible to conduct a fertility survey, through a special staff of lady investigators, of the set of sample families chosen for the usual economic survey. The report now published deals with the results of this fertility survey and the related data regarding population numbers, composition, etc. The number of fertility surveys conducted in India have so far been small and the conduct of these surveys and the presentation of their reports raise a number of specialised problems. This report is, of course, closely related to the report on economic and sociological aspects of the life of Kolhapur which will follow. Its independent technical interest, however, appeared to justify separate publication; this is the reason for the form taken by this first volume of the Kolhapur Survey. In view of the paucity

of previous work on the subject in India it was decided to stress the methodological problems in the report of the fertility survey and to deal, in particular, with its statistical aspect. Mr. V. M. Dandekar, Statistician to the Institute, is responsible for this part of the work.

D. R. GADGIL.

Gokhale Institute
of Politics and Economics
Poona 4
20th September, 1948

PREFACE

I have to express my sincere thanks to the following persons for help and co-operation in the work of the survey: Mr. J. P. Naik (the then Secretary, Development Department, Kolhapur), Mr. R. T. Bagade (the then President, K. M. Borough), Mrs. Indirabai Deshpande (the then Vice-President, K. M. Borough), other Municipal Councillors, and the members of the committee appointed to help us in the work of the Fertility Survey: Mrs. R. Shirgaokar, Mrs. M. Phadke, Mrs. V. Tendulkar, Mrs. Iyyer, Mrs. U. Subnis, Miss M. Gupte, Mrs. N. Yadav.

Special thanks are due to Dr. Rama Varma who kindly made available to me a copy of his thesis, "Cochin: A Study in Differential Fertility" and for giving permission to make use of it.

Gokhale Institute of Politics and Economics
5th May, 1948.

} N. V. Sovani

CONTENTS,

	Page
Foreword 	iii
Preface 	vi
List of Tables 	viii
Section I: The Census Statistics	9-24
1. The Census Unit, p. 9. 2. Historical, p. 9.	
3. Movement of Population, 1872-1941, p. 10.	
4. Birth Place, p. 14. 5. Sex-Ratio, p. 14. 6. Popu-	
lation by Religion, p. 15. 7. Age Composition,	
p. 16. 8. Age, Sex and Civil Condition, p. 18.	
9. Age, Sex and Civil Condition of Communities,	
p. 20.	
Section II: House Sample Population (1946)	25-34
1. The House Sample Inquiry, p. 25. 2. Compari-	
son with the Census Statistics, p. 28. 3. Age, Sex	
and Civil Condition in different wards, p. 32.	
Section III: The Fertility Survey 	35-68
1. Scope, Method and Procedure, p. 35. 2. Sam-	
ple Women, p. 40. 3. Record of Births, p. 41.	
4. Eligible Women, p. 41. 5. Age Distribution of	
Eligible Women, p. 43. 6. Specific Fertility Rates,	
p. 43. 7. Single Age-Year Specific Fertility Rates,	
p. 45. 8. Net Reproduction Rate, p. 45. 9. Fac-	
tors Affecting Fertility, p. 46. 10. Sex of Children	
Born, p. 62. 11. The Age at Marriage, p. 63.	
12. Births and the Rank of Delivery, p. 64. 13.	
Rank of Delivery and Fertility, p. 66. 14. Still	
births, multiple births, and untimely deliveries,	
p. 68.	
Appendix I: Questionnaires used in the House Sample	
and Fertility Inquiries, together with the instruc-	
tions to Investigators 	69
Appendix II: Statistical Notes (by V. M. Dandekar)	76-82
Note 1: Derivation of Specific Fertility Rates,	
p. 76.	
Note 2: The use of chi-square to test the signifi-	
cance of factors other than the age of mother,	
p. 81.	
Note 3: Derivation of Age-Specific Fertility Rates	
made further specific for the difference between	
the ages of husband and wife, p. 82.	

This publication represents the first volume of the report of the third socio-economic survey of an urban area in Maharashtra undertaken by the Institute. The full reports of the two previous surveys have not yet been published. Of the Poona Survey only one of the two projected volumes has been published and the Sholapur Survey is represented by the monograph on the Hand-Loom Weaving Communities and Industry. The full plan of the surveys conducted by the Institute has not so far appeared in print. The introduction to Volume I of the Poona Survey gives a brief sketch of the aims and methods of these urban surveys of the Institute. In many ways the investigations at Kolhapur followed the plan of the work at Poona and Sholapur. We were, however, somewhat more fortunately circumstanced at Kolhapur. Not only had the Institute gathered more experience and was thus able to avoid many mistakes by the time of the Kolhapur Survey but also more active local help was available at Kolhapur and this made it possible to extend in important directions the scope of the Survey.

One such direction was that of a fertility survey. At its very start the investigational work at Kolhapur was able to attract the attention and sympathy of a group of women social workers. With the help of this group we were able to educate public opinion and arouse sympathy with our objective to an extent which made it possible to conduct a fertility survey, through a special staff of lady investigators, of the set of sample families chosen for the usual economic survey. The report now published deals with the results of this fertility survey and the related data regarding population numbers, composition, etc. The number of fertility surveys conducted in India have so far been small and the conduct of these surveys and the presentation of their reports raise a number of specialised problems. This report is, of course, closely related to the report on economic and sociological aspects of the life of Kolhapur which will follow. Its independent technical interest, however, appeared to justify separate publication; this is the reason for the form taken by this first volume of the Kolhapur Survey. In view of the paucity

of previous work on the subject in India it was decided to stress the methodological problems in the report of the fertility survey and to deal, in particular, with its statistical aspect. Mr. V. M. Dandekar, *Statistician to the Institute*, is responsible for this part of the work.

D. R. GADGIL.

Gokhale Institute
of Politics and Economics
Poona 4
20th September, 1948

PREFACE

I have to express my sincere thanks to the following persons for help and co-operation in the work of the survey: Mr. J. P. Naik (the then Secretary, Development Department, Kolhapur), Mr. R. T. Bagade (the then President, K. M. Borough), Mrs. Indirabai Deshpande (the then Vice-President, K. M. Borough), other Municipal Councillors, and the members of the committee appointed to help us in the work of the Fertility Survey: Mrs. R. Shirgaokar, Mrs. M. Phadke, Mrs. V. Tendulkar, Mrs. Iyyer, Mrs. U. Subnis, Miss M. Gupte, Mrs. N. Yadav.

Special thanks are due to Dr. Rama Varma who kindly made available to me a copy of his thesis, "Cochin: A Study in Differential Fertility" and for giving permission to make use of it.

Gokhale Institute of Politics and Economics
5th May, 1948.

} N. V. Sovani

CONTENTS.

	Page
Foreword 	iii
Preface 	vi
List of Tables 	viii
Section I: The Census Statistics	9-24
1. The Census Unit, p. 9. 2. Historical, p. 9.	
3. Movement of Population, 1872-1941, p. 10.	
4. Birth Place, p. 14. 5. Sex-Ratio, p. 14. 6. Popu- lation by Religion, p. 15. 7. Age Composition, p. 16. 8. Age, Sex and Civil Condition, p. 18.	
9. Age, Sex and Civil Condition of Communities, p. 20.	
Section II: House Sample Population (1946)	25-34
1. The House Sample Inquiry, p. 25. 2. Compari- son with the Census Statistics, p. 28. 3. Age, Sex and Civil Condition in different wards, p. 32.	
Section III: The Fertility Survey	35-68
1. Scope, Method and Procedure, p. 35. 2. Sam- ple Women, p. 40. 3. Record of Births, p. 41.	
4. Eligible Women, p. 41. 5. Age Distribution of Eligible Women, p. 43. 6. Specific Fertility Rates, p. 43. 7. Single Age-Year Specific Fertility Rates, p. 45. 8. Net Reproduction Rate, p. 45. 9. Fac- tors Affecting Fertility, p. 46. 10. Sex of Children Born, p. 62. 11. The Age at Marriage, p. 63.	
12. Births and the Rank of Delivery, p. 64. 13. Rank of Delivery and Fertility, p. 66. 14. Still births, multiple births, and untimely deliveries, p. 68.	
Appendix I: Questionnaires used in the House Sample and Fertility Inquiries, together with the instruc- tions to Investigators	69
Appendix II: Statistical Notes (by V. M. Dandekar) 76-82	
Note 1: Derivation of Specific Fertility Rates, p. 76.	
Note 2: The use of chi-square to test the signifi- cance of factors other than the age of mother, p. 81.	
Note 3: Derivation of Age-Specific Fertility Rates made further specific for the difference between the ages of husband and wife, p. 82.	

LIST OF TABLES

Table No.	Page
1. Movement of population in Kolhapur City during 1872-1941.	11
2. Place of Birth	14
3. Sex-Ratio.	15
4. Population of Kolhapur City classified by Religion.	15
5. Age and Sex composition of the population, of Kolhapur City in 1911, 1921, and 1931.	17
6. Age, Sex and Civil condition of the Population of Kolhapur City in 1911, 1921 and 1931.	19
7. Age, Sex, and Civil condition of Different Communities in Kolhapur City in 1911, 1921 and 1931.	21-23
8. Changes made in the Selected House Numbers (H. S.)	26
9. Distribution of Houses in Wards in Kolhapur City by Number of Tenements.	27
10. Distribution of the House Sample and the 1931 Census Population of Kolhapur City by Age and Sex.	30
11. Age, Sex and Marital Status of the 1931 Census and the H. S. Population of Kolhapur City.	30
12. Classification of the H. S. and the 1941 Census Population of Kolhapur City by Communities.	32
13. Distribution of the H. S. Population in the wards by Age, Sex and Civil Condition.	33
14. Distribution of sample women by age groups and by castes.	41
15. Classification of sample women by age groups and by causes determining their 'Eligibility.'	42
16. Distribution of eligible women in the sample by single age-years.	42
17. Specific Fertility Rates of married women by quinquennial age groups in Kolhapur City, Travancore and Cochin.	44
18. Single Age-year Specific Fertility Rates for married women in Kolhapur City and Travancore.	45
19. Calculation of the Net Reproduction Rate in Kolhapur City.	46
20. The classification of eligible women in the sample by age groups and the number of births occurring to each.	47
21. Analysis of Variance.	48
22. The Distribution of eligible women in the sample in each age group according to the ages of their husbands and the observed and expected number of births occurring to them.	49
23. The Distribution of eligible women in the sample in each age group according as their husbands are in relatively higher or lower age groups and the number of observed and expected births occurring to them.	50
24. Fertility Rates specific for the ages of the mother and the father.	51
25. The Distribution of eligible women in the sample in each age group according to the duration of marriage and the observed and expected number of births occurring to them.	52, 53, 54

Table No.	Page
26. The Distribution of eligible women in the sample in each age group according to their age at marriage and the observed and expected number of births occurring to them.	56
27. The Distribution of eligible women in the sample in each age group according to caste and the observed and expected number of births occurring to them.	57
28. The Distribution of eligible women in the sample in each age group according to their family income and the number of observed and expected births occurring to them.	59
29. The Distribution of eligible women in the sample in each age group according to the occupation of the heads of their families and the number of observed and expected births occurring to them.	61
30. The Distribution of eligible women in the sample in each age group according to their occupation and the observed and the expected number of births occurring to them.	62
31. The number of male births to 1,000 female births in different age groups, castes and according to the rank of delivery.	63
32. Average age at marriage of women in the sample by age groups and castes.	64
33. Still births, multiple births and untimely deliveries by age groups occurring to eligible women in the sample during 1941-45.	68

Kolhapur City is the capital of Kolhapur State, Bombay Presidency; situated in 16° 42' N and 74° 16' E. It is the terminus of the Kolhapur State Railway which joins the Southern Mahratta Railway at Miraj.

SECTION I: THE CENSUS STATISTICS

1. **The Census Unit.**—Since the first Census in 1872 the figures regarding the population of the Kolhapur Municipal area and the Cantonment are separately available. The latter included the Civil Station, the Sudder Bazaar and the Infantry Lines. For the first time in 1901 the Census Report gives the population separately for Suburbs, in addition to the other two areas mentioned above. The Suburbs included the newly created ward of Shahupuri and other areas besides. The classification of area introduced in 1901 was followed in the 1911 Census Report. In 1921, however, the Census officer adopted a different classification. Figures were separately furnished regarding the populations of the Kolhapur Municipal area and Shahupuri, the Suburbs, and the Civil Station (formerly Cantonment). In compiling the 1921 Census returns this classification was adopted, but adjustments of the figures of 1911 and 1901 to this new classification were not made, either through oversight or carelessness. As a consequence, the Census Report for 1921 gives the population of the Kolhapur Municipal area and Shahupuri in 1911 as identical with that given by the Census Report of 1911 for the Kolhapur Municipal area alone. In 1931 the same classification was continued, the earlier figures for 1911 and 1901 having been left unadjusted as before. We had to adjust the figures to eliminate this discrepancy. This was possible because the Census Report of 1911 furnished the figures of the population of Shahupuri in 1901 and 1911. In Table 1, figures have been adjusted accordingly.

2. **Historical.**—The earliest estimate of the population of Kolhapur City is that made by Major Graham in 1852. According to him, in 1852 "the population altogether is estimated at 43,387 souls, calculated on a census taken of the living and checked by the returns of mortality."¹ This was divided into the various castes as follows: Brahmins 7,170; Jains 1,185; Lingayets 2,030; Marathas 21,278; other Hindu castes 8,105; Mohammedans 3,619. The classification of the population according to occupations was as follows: Sirdars

¹"Statistical Report on the Principality of Kolhapur," compiled by Major D. C. Graham, Political Superintendent at Kolhapur, 1854. Selections from the Records of the Bombay Government, No. VIII, New Series, p. 115.

40; 1st class Inamdars 16; Petty Inamdars 500; Palace establishment 4,633; Artificers or Manual labourers 2,077; Manufacturers and those engaged in other occupations 2,336; Petty traders 2,735; Day-workmen 1,400; and others including 3,832 servants, pages, etc., 20,286 women and children and 100 Mangs and Ramosees.²

Remarking upon the general state of the town of Kolhapur at that time, Major Graham observed: "The town of Kolhapur is now greatly overgrown, exceeding in circumference a distance of four miles and a half, and totally disproportionate as a capital to the extent of territory; but in later times, the residence of a despotic Government, chiefs and officers flocked to the Court; and the numbers were further swollen by the royal army and the retainers required, according to the spirit of the nation, to be in attendance. About one-twelfth of the entire population of the State was thus huddled together in great discomfort, and as no sanitary measures were in force, the ravages of the epidemics were severe; and in the year 1824, 8,000 people were carried off during the short period of a fortnight."³

3. **Movement of Population, 1872-1941.**— The population of Kolhapur City increased by about 140 per cent during the period of 70 years between 1872 and 1941. Nearly three-fourths of this increase occurred, however, during the last two decades. Table 1 sets out the relevant data.

In 1872 the total population of Kolhapur City, including Sudder Bazaar and Infantry Lines,⁴ was 39,621. The population of "Kolhapur Cantonment" in the same year was put at 1,412.⁵ Of the total population of Kolhapur, excluding Infantry Lines and Sudder Bazaar, 89 per cent were Hindus and 8 per cent Mohammedans. The ratio of females to males was 92 to 98.

Compared with Major Graham's figures for 1854, the 1872 Census recorded a slight decline in the population. We do not know whether Graham's figure included the Cantonment population. If it did, the decline in 1872 can be put at

²Ibid., p. 116.

³Ibid., p. 113.

⁴A footnote on p. 507 in the "Census of the Bombay Presidency," 1872, Part II, explains that to the population of Kolhapur (put at 37,663 in the text) was to be added the population of Infantry Lines and Sadar Bazaar, which was 1,958.

⁵Ibid., p. 241.

TABLE 1. MOVEMENT OF POPULATION IN KOLHAPUR CITY DURING 1872-1941

(Source: Indian Census Reports)

Unit	1941	1931	1921	1911	1901	1891	1881	1872
1. Kolhapur Municipal Area and Shahapuri	93,032	66,728	49,948	42,416	50,329	45,813	38,599	37,633*
2. Suburban Area	--	3,132	3,295	3,433	1,818			
3. Civil Station and Infantry Lines	2,886	2,632	2,351	2,273	2,226	1,559	1,331	
TOTAL	95,918	72,492	55,594	48,122	54,373	47,372	39,910	37,663

*This excludes the population of Sadar Bazaar and Infantry Lines which was 1,958 and that of the Cantonment which was 1,412.

about 2,000. The comparative decline of the royal court at Kolhapur after British occupation and the consequent reduction in the numbers of those dependent on it, partly foreshadowed by Graham, may account for this decline.

The population of the Kolhapur Municipal area, including the Suburban area, was put at 38,599 in 1881, and that of the Civil Station and Infantry Lines at 1,311. We believe that the latter two areas specified include the area formally designated as "Cantonment." The total population of Kolhapur (all areas) in 1872 was 41,033 and the 1881 figures, therefore, showed a decline of about 1,000*

At the next Census in 1891, the population of the Kolhapur Municipal area and the Suburban area together recorded an increase of more than 7,000. Already toward the close of the preceding decade the life in the town was becoming more enlivened and a sort of revival was getting under way. New buildings were rising in the town, prominent among these being the New Palace outside the town (1877-84), and the

*Dr. Hewlett, the Sanitary Commissioner of the Bombay Presidency, visited Kolhapur in July, 1876, and presented a report on the sanitary conditions in the town. He commented on the dirt and squalor, the insanitary water-supply, the congestion and overcrowding in the town, as well as on the defective birth and death records in the city. Quoted in "History of the Kolhapur Municipality" (in Marathi) by J. P. Naik, 1944, pp. 70-75.

Albert Edward Hospital (1881-84). The Rajaram College was started shortly after 1880. The old fort wall round the town was demolished and the moat round it was filled up. This was mainly done for fighting the overcrowding within the town wall, and to encourage people to build new houses outside it. The supply of drinking water in the town was very much improved by the construction of the Kalambe Tank (1881-83) in the vicinity of the town, whose water was brought into the town by a conduit. Pipe lines were also laid throughout the town. The drainage system was also improved and underground drains of stone were constructed in several parts of the town. A stone embankment was built round a part of the Rankala lake in the vicinity of the town (1877-83). The capacity of the lake was increased and the original intention, in doing this, was to supply drinking water to the town from it. The idea was later given up. During this period the Shivaji Bridge, fording the Panchganga River, was constructed, and roads leading into the Konkan from Kolhapur were completed. This resulted in the growth of trade and traffic into and through Kolhapur and the town came into prominence as a gateway to the Konkan. Trade was further stimulated by the construction and opening of the Miraj-Kolhapur railway line in 1891. The conditions in the town were thus favourable for population growth. Of the total increase of about 7,000 recorded at the Census in 1891, about 4,000 were males and the rest females. The larger increase among males might have been due to the presence in the town of male immigrants attracted by its growing trade, etc.

In 1901, the population of the Kolhapur Municipal area and Shahupuri increased to 50,329. The preceding decade was generally prosperous, but was marred by the outbreak of plague and the occurrence of famines toward its close. The Shahupuri ward was created in 1896. Kolhapur was growing in importance as a centre of trade, particularly after the opening of the Miraj-Kolhapur railway in 1891, and many traders were settling in the town. The conditions were thus favourable for an increase in the population, though they were adversely affected toward the close of the decade by plague and famine. It might be also noted that the net increase of population of about 5,000 in the Kolhapur Municipal area and Shahupuri was almost equally divided between the two sexes.

During the next decade, the population of the Kolhapur Municipal area and Shahupuri recorded a decline of about 8,000. The population of the Suburbs increased by a little less than 90 per cent, while that of the Civil Station and Infantry Lines remained stagnant. Commenting on the decrease of the population of the Kolhapur Municipal area, the Deputy Superintendent of the Census in 1911 wrote: "The decrease in population was due to the severity of the plague epidemics that have attacked the city repeatedly since 1901. The population in Shahupuri, a suburb of Kolhapur City, has, however, increased from 1,233 to 2,671, the rise being due to the tendency of the citizens to erect houses with sufficient ventilation in the open air of the suburb and to the starting of the Shri Shahu Mills and other industries in Shahupuri."⁷

In 1921 the total population of Kolhapur recorded an increase. Almost the whole of this increase was confined to the Kolhapur Municipal area and Shahupuri. The population of the Suburbs showed a slight decline and that of the Civil Station and Infantry Lines, only a slight increase. The influenza epidemic of 1918-19 affected the population adversely. The total deaths recorded in Kolhapur city in 1918-19 increased to 2,665 from 1,628 in the preceding year. The decade was otherwise normal. The growth of population in Shahupuri was to be largely attributed to the growth of the trade of the town, which was largely concentrated in Shahupuri.⁸ The increase in the population was almost equally shared by both the sexes.

In 1931 the total population of Kolhapur recorded an increase of 30 per cent over that of 1921. The increase, as during the previous decade, was mostly concentrated in the Kolhapur Municipal area and Shahupuri. The decade 1921-1931 was free from epidemics. During this period many city development schemes were adopted and executed. Kolhapur was rapidly becoming a large centre of motor-bus transport in the Southern Maratha Country. Trade and industries in the town were also expanding. In 1928 the Shahu Spinning Mill was expanded and a weaving department was opened. Educational institutions in the town were also multiplying and the town was growing in importance as a place of education. The total increase of about 17,000 that occurred during this decade

⁷"Census of 1911, Kolhapur and S. M. C. States," p. 14.

⁸"Census Report, Kolhapur and S. M. C. States," 1921, p. 10.

was unequally shared among the sexes, females increasing by 7,000 only.

At the Census of 1941 the population showed an increase of 32 per cent. No detailed Census Tables have been published, because the tabulation of Census data was given up for reasons of economy in India. The comments have, therefore, also to be brief. The preceding decade was not free from epidemics like plague, but these were much milder than in previous decades. The economic conditions had been depressed, but at the time of the Census in 1941 World War II was in the third year and business and trade in the town was brisk.

4. **Birth-place.**—Table 2 gives the classification of the population according to birth-place.

TABLE 2. PLACE OF BIRTH
(Source: Indian Census Reports)

Year	Kolhapur State	S. M. C. Jagirs	Ratnagiri	Belgaum	Satara	Other Districts or States in Bombay Province	Outside Bombay Province in India	Other Countries	Total
1931	64,627	1,101	1,586	1,790	1,126	1,533	703	26	72,492
Per Mille	891	15	22	25	16	21	10	—	1,000
1921	48,510	901	1,277	1,155	1,417	1,911	408	15	55,594
Per Mille	873	16	23	21	26	34	7	—	1,000
1911	42,820	706	1,084	832	1,117	1,100	450	13	48,122
Per Mille	890	15	23	17	23	23	9	—	1,000

These are the only type of migration statistics compiled in India every ten years at the time of the Census. As migration statistics they are, of course, not of much use. Their shortcomings are well known and need not engage us here. The figures in Table 2 do not call for any lengthy comment. They show generally that the population of Kolhapur was largely home-born, the few outsiders being mainly derived from the surrounding territory of Kolhapur State and the Jagirs, the Konkan districts and the Belgaum and Satara districts.

5. **Sex Ratio.**—Table 3 gives the figures regarding the sex-composition of the population.

The figures for the Suburbs, the Civil Station and Infantry Lines and the Municipality have been given separately in the table. It is, however, not necessary to comment separately

TABLE 3. SEX RATIO
(Source: Indian Census Reports)

		Number of Females Per 1,000 Males								
Area	Year	1941	1931	1921	1911	1901	1891	1881	1872	1852
Municipal Area	}	877	844	894	932	972	958	—	—	—
Suburban Area			704	762	696	773				
Infantry Lines	}	955	837	858	811	786	742	—	—	—
Civil Station					523	868				
Total		880	837	884	892	952	951	987	925	880

on these figures. Only the aggregate figures for Kolhapur town, Suburbs and the Civil Station and Infantry Lines are commented upon in the following.

The figures for 1852 and 1872 cannot be explained satisfactorily. From 1881 up to 1931 there was almost a continuous decline of the male-female ratio. This might result from a steadily growing influx of male migrants into the town because of the growing trade and industries in it. Regarding migrations, as explained above, the statistics are insufficient to throw light on this particular problem. In 1941, however, the proportion of women in the total population recorded an increase. No explanation can be offered for this development.

6. **Population by Religion.**—Table 4 gives the population of Kolhapur City according to communities during 1911-1941.

TABLE 4. POPULATION IN KOLHAPUR CITY CLASSIFIED BY RELIGION
(Sources: Indian Census Reports)

Religion	1941	1931	1921	1911
Total	95,918	72,492	55,594	46,122
Hindus	79,858	62,156	47,865	41,733
Muslims	9,247	7,194	5,270	4,417
Jains	5,481	2,324	1,771	1,346
Zoroastrians	—	5	9	18
Christians	1,316	813	679	608
Others*	16	—	—	—

*Includes Zoroastrians for 1941 only.

As before, the figures for Kolhapur City as a whole are considered below. The figures of total growth show that as

compared with the growth of the total population during 1911-41, the most remarkable growth was among the Jains who increased by a little more than 300 per cent during the period. The Hindus showed a below-average increase, while the Mohammedans and Christians showed an increase slightly above the average. The movement of populations of Hindus, Mohammedans and Christians need not be commented upon, as they broadly conform to the general pattern of the movement of population of the city as a whole. The growth of the Jain population is a remarkable phenomenon. Most of this remarkable growth took place during 1931-1941. The explanation of this can be sought in two directions. It might be due to the natural increase of the population and/or to an influx of immigrants into the town. As regards the first, it is possible to say from the available figures that the age and sex composition of the Jains, as revealed by the Census of 1931, was more favourable to growth than that of the other communities. In 1931 the proportion of women between 15 and 45 years of age to the total women was 49.2 per cent among Hindus and 46.6 per cent among Mohammedans; it was 52.5 per cent among the Jains. So also while the proportion of married women between 15 and 45 years to total women in the Jain community was about 91 per cent, the proportion among Hindus was 85 per cent, and that among Mohammedans, 82 per cent. This might be interpreted as some evidence to show that the Jains might have increased at a faster rate than the other communities during 1931-41. This must be, of course, adjusted for the considerably lower sex ratio among the Jains than in the other communities. As regards migration, no detailed figures are available. Jains are a commercially-minded community and they are prominent in Kolhapur trade. The growing trade in the city, especially after the outbreak of World War II, might have attracted Jains from surrounding parts into it.

7. Age Composition.—Table 5 sets out the information regarding the age composition of the population in Kolhapur City.

These statistics, as all the age statistics in the Indian Census Reports, are defective in many respects. The ages are not usually returned accurately and there is a tendency on the part of people to report their ages as some multiples

TABLE 5. AGE AND SEX COMPOSITION OF THE POPULATION IN
KOLHAPUR CITY IN 1911, 1921 AND 1931

(Source: Indian Census Reports)

Age Group	1931			1921			1911		
	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
0-	9,287	4,771	4,516	6,112	3,183	2,929	5,888	3,052	2,836
Per Cent	12	12	14	11	11	11	12	12	13
5-	8,864	4,795	4,069	6,899	3,516	3,383	5,409	2,812	2,597
Per Cent	13	12	12	12	12	13	11	11	11
10-	8,644	4,651	3,993	6,875	3,949	2,926	5,448	2,949	2,499
Per Cent	12	12	12	12	13	11	11	12	11
15-	8,220	4,628	3,592	5,322	3,104	2,218	4,740	2,680	2,060
Per Cent	11	12	11	10	11	9	10	11	9
20-	24,833	13,884	10,949	18,056	9,521	8,535	16,138	8,563	7,575
Per Cent	34	35	33	33	32	33	34	34	33
40-	9,936	5,421	4,515	9,170	4,700	4,470	8,088	4,228	3,860
Per Cent	14	14	14	16	16	17	17	17	17
60 and over	2,708	1,316	1,392	3,160	1,529	1,631	2,411	1,153	1,258
Per Cent	4	3	4	6	5	6	5	5	6
Total	72,492	39,466	33,026	55,594	29,502	26,092	48,122	25,437	22,685
	100	100	100	100	100	100	100	100	100

of five. The age returns, therefore, show concentrations at five-year-age intervals. For individual years, the age returns certainly give wrong information, but when arranged in classes of five or ten years, they give a fairly accurate picture of the age composition of the population. We shall have occasion to comment again on age statistics in Section III.

A few remarkable developments as revealed by the figures in Table 5 may be commented upon. Among the females in the age group 0-5 years, there was a sharp decline in 1921. While the proportion of women in this age group to the total women was 13 in 1911, in 1921 it had dropped to 11, but had again increased to 14 in 1931. In the age group 40-60, the women show a sharp drop in 1931; the proportion of women in this age group to total women dropping from 17 per cent in 1911 and 1921 to 14 per cent in 1931. The proportion of males in the same age group also showed a decline in 1931, but the decline was, though slight, also to be found in 1921. Both these developments might be expected in the age composition of a growing urban centre, which, as it expands, attracts more and more young male and female immigrants, particularly the former. As a consequence, the proportion of the population in old age groups declines. As a counterpart of the decline among males and females of 40-60 years noted above is to be found the

increase in the proportion of males and females in the age group 15-40. The proportion of females in the age group 15-40 increased from 42 per cent in 1921 to 44 per cent in 1931, while that of males in the same age group from 43 per cent in 1921 to 47 per cent in 1931.

8. **Age, Sex and Civil Condition.**—Table 6 sets out the information regarding the age, sex and civil condition of the total population of the Kolhapur Municipal area, Suburbs and Civil Station. The population of the Suburbs and the Civil Station formed only a small proportion of the total population, and no purpose could have been served by treating the figures for all these parts of the town separately. They were, therefore, combined in a single table for comments.

A few broad features stand out from the figures almost immediately. The percentage of the married population in the total has remained almost unchanged around 45 during 1911-31. On the other hand, the percentage of unmarried population in the total increased from 38 in 1911 to 44 in 1931, while that of the widowed population decreased from 16 in 1911 to 11 in 1931. Though the percentage of the married had remained almost steady during 1911-31, there were some significant changes in the age distribution of the married population. Among married males in 1911 the percentage of those in the age group 20-40 was 57, and that of those in the age group 40-60 years was 28. In 1931 the percentages had changed to 60 and 26 respectively. Among married females the percentage of those below 15 years of age was 19 in 1911, and in 1931 this had declined to 11. The percentage of married women of the age group 20-40 was 17 in 1911 and 20 in 1931. These figures would broadly indicate that among females the tendency was toward the age at marriage rising during 1911-31.

The decline in the percentage of the widowed population during 1911-31 was very largely concentrated among females, and particularly among females below 20 years of age. The proportion among the female widowed population of those below 20 years of age was 4 per cent in 1911, and it had declined to 2 per cent in 1931. This would broadly indicate that because of the decline in the number of marriages below 15 years of age, many such females, who would have

increase in the proportion of males and females in the age group 15-40. The proportion of females in the age group 15-40 increased from 42 per cent in 1921 to 44 per cent in 1931, while that of males in the same age group from 43 per cent in 1921 to 47 per cent in 1931.

8. **Age, Sex and Civil Condition.**—Table 6 sets out the information regarding the age, sex and civil condition of the total population of the Kolhapur Municipal area, Suburbs and Civil Station. The population of the Suburbs and the Civil Station formed only a small proportion of the total population, and no purpose could have been served by treating the figures for all these parts of the town separately. They were, therefore, combined in a single table for comments.

A few broad features stand out from the figures almost immediately. The percentage of the married population in the total has remained almost unchanged around 45 during 1911-31. On the other hand, the percentage of unmarried population in the total increased from 38 in 1911 to 44 in 1931, while that of the widowed population decreased from 16 in 1911 to 11 in 1931. Though the percentage of the married had remained almost steady during 1911-31, there were some significant changes in the age distribution of the married population. Among married males in 1911 the percentage of those in the age group 20-40 was 57, and that of those in the age group 40-60 years was 28. In 1931 the percentages had changed to 60 and 26 respectively. Among married females the percentage of those below 15 years of age was 19 in 1911, and in 1931 this had declined to 11. The percentage of married women of the age group 20-40 was 17 in 1911 and 20 in 1931. These figures would broadly indicate that among females the tendency was toward the age at marriage rising during 1911-31.

The decline in the percentage of the widowed population during 1911-31 was very largely concentrated among females, and particularly among females below 20 years of age. The proportion among the female widowed population of those below 20 years of age was 4 per cent in 1911, and it had declined to 2 per cent in 1931. This would broadly indicate that because of the decline in the number of marriages below 15 years of age, many such females, who would have

been married and widowed in the natural course, were spared both the ordeals. This would thus largely appear to be the result of the rise in the age at marriage.

This development is also corroborated by a further analysis of the figures regarding the unmarried. The increase in the proportion of unmarried in the total population was again largely confined to the females, and particularly among females of 10-15 years of age. Among the unmarried population, the proportion of those in the age group 10-15 years was 16 per cent in 1911, and it had increased to 24 per cent in 1931. We shall have occasion to comment in greater detail regarding this tendency toward a rise in the age at marriage up to 1931 in Section III.

In the total married population, the proportion of persons in the age group 15-40 increased from 67 per cent in 1911 to 73 per cent in 1931. Among males it increased from 64 per cent in 1911 to 67 per cent in 1931, and among females from 70 per cent to 77 per cent during the same period. The proportion in the same age group among the unmarried population was 19 per cent in 1911, and had increased to 22 per cent in 1931. Among females it had increased from 4 per cent in 1911 to 6 per cent in 1931, and among males from 26 per cent to 31 per cent during the same period. This latter movement would suggest a rise in the age at marriage of males.

9. Age, Sex and Civil Condition of Communities.—Table 7 summarises the data regarding the age, sex and civil condition in respect of Hindus, Mohammedans and Jains.

The sex ratio showed a continuous decline in all the communities during 1911-31. The number of females per 1,000 males declined from 890 in 1911 to 862 in 1931 among the Hindus, from 886 to 830 among Mohammedans and from 840 to 730 among the Jains. Among the two former communities the decline was only slight, that is, only about 5 points, during 1911-21, the major part of the decrease occurring in the next decade. Among Jains these developments were in the reverse order.

Only some broad trends might be noted regarding the major age groups. The proportion of persons in the age group

TABLE 7. AGE, SEX AND CIVIL CONDITION OF DIFFERENT COMMUNITIES IN KOLHAPUR CITY IN 1911, 1921 AND 1931
(Source: Indian Census Reports)

Age Group	1931											
	TOTAL			UNMARRIED			MARRIED			WIDOWED		
	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
HINDUS												
0-	7,936	4,088	3,848	7,900	4,065	3,835	33	21	12	3	2	1
5-	7,556	4,095	3,461	7,147	4,033	3,114	400	61	339	9	1	8
10-	7,297	3,934	3,363	6,076	3,767	2,309	1,196	163	1,033	25	4	21
15-	7,056	3,962	3,094	3,138	2,824	314	3,797	1,111	2,686	121	27	94
20-	21,286	11,862	9,424	2,728	2,504	224	16,346	8,883	7,463	2,212	475	1,737
40-	8,685	4,739	3,946	160	118	42	5,314	3,854	1,460	3,211	767	2,444
60-	2,340	1,142	1,198	30	18	12	850	710	140	1,460	414	1,046
TOTAL	62,156	33,822	28,334	27,179	17,329	9,850	27,936	14,803	13,133	7,041	1,690	5,351
MUSLIMS												
0-	1,035	531	504	1,031	528	503	4	3	1	—	—	—
5-	933	506	427	903	502	401	27	2	25	3	2	1
10-	920	495	425	790	485	305	122	7	115	8	3	5
15-	769	420	349	553	301	52	402	115	287	14	4	10
20-	2,404	1,373	1,031	390	360	30	1,807	950	857	207	63	144
40-	855	475	380	93	18	15	553	389	164	269	68	201
60-	278	132	146	2	1	1	103	83	20	173	48	125
TOTAL	7,194	3,932	3,262	3,502	2,195	1,307	3,018	1,549	1,469	674	188	486
JAINS												
0-	233	118	115	232	117	115	1	1	—	—	—	—
5-	261	145	116	249	140	109	12	5	7	—	—	—
10-	275	165	110	243	157	86	31	8	23	1	—	1
15-	270	189	81	162	150	12	102	38	64	6	1	5
20-	900	520	380	149	146	3	640	330	290	111	24	87
40-	314	171	143	8	8	—	182	125	57	124	38	86
60-	71	35	36	—	—	—	18	17	1	53	18	35
TOTAL	2,324	1,343	981	1,043	718	325	986	544	442	295	81	214

TABLE 7. (Contd.)

Age Group	1921											
	TOTAL			UNMARRIED			MARRIED			WIDOWED		
	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
HINDUS												
0-	5,209	2,732	2,477	5,072	2,702	2,370	125	30	95	12	—	12
5-	5,918	3,053	2,865	5,584	2,999	2,585	308	54	254	26	—	26
10-	5,912	3,411	2,501	5,458	3,185	1,273	1,349	185	1,164	105	41	64
15-	4,564	2,681	1,883	2,178	2,076	102	2,241	572	1,669	145	33	112
20-	15,578	8,162	7,416	1,677	1,496	181	11,718	6,156	5,562	2,183	510	1,673
40-	7,965	4,067	3,898	202	132	70	4,723	3,184	1,539	3,040	751	2,289
60-	2,719	1,300	1,419	35	22	13	1,016	831	185	1,668	447	1,221
TOTAL	47,865	25,406	22,459	19,206	12,612	6,594	21,480	11,012	10,468	7,179	1,782	5,397
MUSLIMS												
0-	658	343	315	636	327	309	21	16	5	1	—	1
5-	711	333	378	685	324	361	26	9	17	—	—	—
10-	664	384	280	535	368	167	126	16	110	3	—	3
15-	454	249	205	201	179	22	247	68	179	6	2	4
20-	1,660	891	769	213	188	25	1,293	653	640	154	50	104
40-	776	422	354	23	13	10	494	352	142	259	57	202
60-	347	179	168	7	7	—	119	92	27	221	80	141
TOTAL	5,270	2,801	2,469	2,300	1,406	894	2,326	1,206	1,120	644	189	455
JAINS												
0-	163	81	82	158	77	81	4	3	1	1	1	—
5-	164	92	72	156	89	67	6	2	4	2	1	1
10-	199	112	87	150	106	44	47	6	41	2	—	2
15-	227	147	80	125	123	2	99	24	75	3	—	3
20-	636	397	239	93	87	6	454	276	178	89	34	55
40-	318	151	167	11	7	4	186	115	71	121	29	92
60-	64	27	37	2	2	—	20	16	4	42	9	33
TOTAL	1,771	1,007	764	695	491	204	816	442	374	260	74	186

TABLE 7. (Contd.)

Age Group	1911											
	TOTAL			UNMARRIED			MARRIED			WIDOWED		
	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
HINDUS												
0-	5,102	2,649	2,453	5,032	2,616	2,416	69	33	36	1	—	1
5-	4,660	2,444	2,216	4,318	2,395	1,923	314	47	267	28	2	26
10-	4,616	2,562	2,054	3,034	2,311	723	1,499	237	1,262	83	14	69
15-	4,101	2,336	1,765	1,597	1,353	44	2,310	741	1,569	194	42	152
20-	14,057	7,434	6,623	1,205	1,081	124	10,689	5,844	4,845	2,163	509	1,654
40-	7,100	3,703	3,397	147	112	35	4,060	2,826	1,234	2,893	765	2,128
60-	2,097	994	1,103	35	27	8	687	600	87	1,375	367	1,008
TOTAL	41,733	22,122	19,611	15,368	10,095	5,273	19,628	10,328	9,300	6,737	1,699	5,038
MUSLIMS												
0-	596	312	284	589	310	279	6	2	4	1	—	1
5-	531	265	266	504	258	246	25	6	19	2	1	1
10-	510	272	238	378	250	128	126	20	106	6	2	4
15-	371	207	164	160	150	10	196	52	144	15	5	10
20-	1,451	777	674	199	178	21	1,089	549	540	163	50	113
40-	723	390	333	29	20	9	429	302	127	265	68	197
60-	235	118	117	4	2	2	86	72	14	145	44	101
TOTAL	4,417	2,341	2,076	1,863	1,168	695	1,957	1,003	954	597	170	427
JAINS												
0-	131	61	70	130	61	69	1	—	1	—	—	—
5-	133	71	62	128	70	58	5	1	4	—	—	—
10-	158	91	67	115	84	31	37	7	30	6	—	6
15-	170	110	60	87	86	1	75	20	55	8	4	4
20-	480	274	206	53	51	2	351	203	148	76	20	56
40-	206	100	106	5	4	1	101	75	26	100	21	79
60-	68	34	34	1	1	—	23	18	5	44	15	29
TOTAL	1,346	741	605	519	357	162	593	324	269	234	60	174

40-60 showed a decline during 1911-31 in all the communities, the largest decline occurring among Mohammedans. The proportion of the population in the age group 20-40 did not show any significant change during the same period among both the Hindus and the Mohammedans. But among the Jains the proportion increased from about 36 per cent in 1911 to 39 per cent in 1931. Among the Hindus and Mohammedans the age group 15-20 showed a slight increase during the period, but among the Jains a slight decline was recorded. A glance at the age composition of the three communities shows that there were only minor differences in this respect as between the Hindus and the Mohammedans. But the Jains displayed some significant differences. On the whole, the proportion of population in the age group 20-40 was markedly higher among the Jains than among the other two.

As regards civil condition, it can be observed that the proportion of unmarried males had increased by about 6 per cent in all the communities during 1911-31. The major part of this increase had occurred during 1921-31. The proportion of unmarried females had also increased by about 6 per cent during the same period among the Mohammedans and Jains, but the increase was 8 per cent among the Hindus. The proportion of widowers in the total population showed a slight decline in all communities. The proportion of widows showed a rather sharper decline over the period in all communities. The decline was only 4 per cent among Jains, 6 per cent among Mohammedans and 7 per cent among Hindus.

SECTION II: HOUSE SAMPLE POPULATION (1946)

1. **The House Sample Inquiry.**—In this Section information regarding the population of the city at the time of our survey is presented. This information is furnished by the comprehensive inquiry into the socio-economic life of the resident families in the city that was carried out by us and which was the pivotal inquiry around which the whole survey revolved. In making this inquiry, the methods and procedure followed were, with minor modifications, similar to those followed in the surveys of Poona and Sholapur previously carried out by the Institute. In selecting the sample for this inquiry, we took the house as the unit in preference to the family, mainly because no lists of families resident in the city were available to us.

Kolhapur City is divided into five wards. The total area within the municipal limits has been divided, according to the latest city survey, into 14,195 so-called "estates." Each "estate" is given a serial number and there is a separate series of such numbers for each ward. An "estate" may be a house, a tank, an open plot of ground, agricultural land, etc. In giving numbers to various "estates," the city survey looks mainly to the convenience of the record of land, etc., rights. All the houses in the city bear the numbers given by the city survey and these numbers are usually treated as house numbers. It is, however, obvious that every city survey number does not necessarily represent a house. For our purposes it was necessary to make a list of houses in the city which were mainly or partly used for residential purposes. It was not possible to draw up such a list from the city survey records. A Rent Survey was, however, in progress at the time our inquiry was being planned. The information collected in this survey was made available to us by the Kolhapur Municipal Authorities and from this we were able to prepare lists of house numbers which were used mainly for residential purposes. Temples, mosques, hospitals and houses used only for commercial purposes could be thus excluded from our list initially. In respect of Ward A, which had not till then been covered by the Rent Survey, similar information regarding houses was not available. It was collected by our junior investigators by visiting

every house in the ward. This was necessarily a hurried inquiry and had to be conducted in the course of two or three days. The information gathered was not, therefore, so thorough as in the Rent Survey, and showed many gaps during the subsequent inquiry. As can be seen from Table 8, the largest number of substitutions of house numbers had to be made in respect of this ward. When the lists of residential house numbers were ready, every tenth house in them, beginning with the first in each list, was marked for being included in the sample. Of the total 14,195 "estates" in Kolhapur City, 11,580 were found to be residential houses. Our sample included 1,160 houses.

The house numbers originally selected could not be adhered to in all cases. Some of the houses were found to be non-residential, in some others there were no residents at the time of the survey, still others, because of a vast programme of city planning that was then actively under way, had been pulled down for road widening and construction of new roads. The numbering of houses was in many cases defective. In some cases even privies were found to have been given separate numbers. Also some of the numbers could not be traced. For all these, new numbers had to be substituted in the sample. For giving substitute numbers a definite procedure, as in the Poona Survey, was adopted. Where a particular house number had to be substituted, the one preceding it in the list was substituted; if even the latter was found to be unsuitable, the number next to the house number originally selected was substituted. Table 8 shows the number of house numbers thus substituted and the reasons for these substitutions.

TABLE 8. CHANGES MADE IN THE SELECTED HOUSE NUMBERS (H. S.)

Ward	Municipal House No. Not Traced	Demolished	Under Construction	Uninhabited and Un-habitable	Open Plots	Used for Non-Residential Purposes	Refusal to Give Information	Total
A	3	27	2	18	15	4	1	70
B	1	4	1	9	5	5	1	24
C	1	2	1	12	1	3	1	21
D	6	3	1	8	1	3	1	24
E	1	2	1	9	6	4	4	25
Total	9	38	3	56	26	24	8	164

The choice of the house rather than the family as the unit of the sample might have distorted our sample, in respect of resident families in the city, if the sampled houses had largely consisted of specially large units containing a large number of families of homogeneous types, that is, families belonging to the same caste or profession, etc. As can be seen from Table 9, this did not happen. Our sample was well distributed. More than half of the sample houses were one-tenement houses. Houses having more than five tenements were slightly more than 3 per cent of the total houses in the sample.

TABLE 9. DISTRIBUTION OF HOUSES IN THE WARDS IN KOLHAPUR CITY BY NUMBER OF TENEMENTS

Wards	No. of Tenements														Students	Total	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14			
A	168	56	21	9	5	1	—	—	1	—	—	—	—	—	—	—	261
B	132	54	21	9	4	2	—	—	3	1	—	—	—	—	—	—	226
C	132	58	30	9	6	2	—	—	1	—	—	1	1	—	—	—	240
D	134	53	27	9	2	5	2	2	—	—	—	—	—	—	—	—	234
E	108	42	16	9	5	10	4	1	2	—	—	—	—	—	2	—	199
Total	674	263	115	45	22	20	6	3	7	1	—	1	1	2	—	—	1,160
Total Tenements	674	526	345	180	110	120	42	24	68	10	—	12	13	28	10	—	2,157

As in the Poona Survey, the investigators were chosen from among the primary teachers of the city. In all, 26 investigators were recruited for the purpose. The houses to be covered by each one were allotted to him by the Survey Office. Usually an investigator was allotted the sample houses that were near and around his own residence, so that some knowledge of the locality in which he was collecting information and of the residents thereof could be safely expected of him. This led to more correct entries in the inquiry schedules. The average number of schedules filled in by an investigator were 83. They were uniformly paid at the rate of eight annas per questionnaire correctly filled in.

The questionnaire used was almost the same as in the Poona Survey with a few modifications. A translation of it is given in Appendix I, together with the explanations and instructions given to the investigators. At a preliminary meeting of the investigators on November 8, 1945, the whole

questionnaire was explained to them item by item. All queries and doubts of the investigators were cleared. They were then asked to fill in a sample of ten questionnaires each, of any of the families of their acquaintance, and to return them to the Survey Office the next day. These were then critically examined. The mistakes that were detected were pointed out to the investigators at a second meeting on November 10, 1945, and all lingering doubts, etc., were again clarified. The work of the survey began during the subsequent week and each investigator was allotted his house numbers. One questionnaire for every family resident in the selected house numbers was filled in. As in the Poona Survey, the family was defined as "any group of persons living together as a separate economic unit." All the questionnaires were accepted at the Survey Office only after a careful scrutiny for consistency, adequacy and definiteness of information. Questionnaires failing to satisfy the tests laid down were referred back and correct information was again sought. Besides this, about 5 per cent of the sample houses were independently visited by the junior investigators of the Survey Office for checking the information contained in the questionnaires regarding the families in those houses. By this procedure it was possible to avoid a large number of mistakes, etc., and consequently the total number of questionnaires that had to be finally rejected was negligible.

A glance at the translation of the questionnaire used in this inquiry printed at the end of this Section, would show that the information collected by means of it covered a very wide range. All this information will be presented at appropriate places in the course of the series of volumes on the Social Survey of Kolhapur City. The present volume deals with population only, and the information on this item abstracted from the family schedules is presented here.

2. **Comparison With the Census Statistics.**—The information regarding the House Sample population can be compared with the 1941 Census information only in one or two respects because of the incompleteness of the latter; in all other cases the comparison can be made only with the 1931 Census information.

The total House Sample population was 10,590. The House Sample included one-tenth of the residential houses in Kolhapur, but it need not be supposed to have necessarily

covered one-tenth of the total families or population in the city. Many house numbers had to be substituted for in the original list. But broadly speaking, we shall not be far wrong if we take our sample as covering one-tenth of the population in the city. Under this assumption, the total population of the city at the time of our survey might be put in the neighbourhood of 105,000. As compared with the 1941 population of 95,904, this might be taken to show an increase of about 10 per cent during the intervening 5 years. The sample population, however, does not include vagrants as well as the populations of institutions like hospitals, jails, etc., which are included in the Census enumeration. If a due allowance is made for this fact, the rate of increase of the population can be regarded as exceeding 10 per cent.

In the House Sample population the number of females per 1,000 males was 993. It was 880 in 1941. The considerably higher proportion of females in the House Sample than in the Census population is not, however, surprising. As remarked earlier, the former does not include vagrants as well as institutional populations—population groups in which males are more numerous than females—which the latter does. The same phenomenon was also met with in the Poona Survey.¹

Table 10 gives the distribution of the House Sample population according to age along with that of the 1931 Census population. It will be observed on a comparison of these figures that, while the first two age groups in the House Sample population show marked increases, the age groups 20-40 and 40-60 record declines of 4 per cent and 2 per cent respectively. This is again not surprising if we remember the peculiarities of the House Sample population noted earlier. It should be noticed that the increases and decreases in the majority of age groups are more marked among males than among females. This would naturally result from the exclusion of predominantly male populations from the House Sample population.²

Table 11 sets out the information regarding the age, sex and marital condition of the House Sample and the 1931 Census populations.

¹ "Poona: A Socio-Economic Survey," Part I—Economic, D. R. Gadgil, G.I.P.E., Publication No. 13, 1945, p. 43.

² Cf. Op. Cit., p. 43.

TABLE 10. DISTRIBUTION OF THE HOUSE SAMPLE AND THE 1931 CENSUS POPULATION OF KOLHAPUR CITY BY AGE AND SEX

Age Group	1931			HOUSE SAMPLE		
	Persons	Males	Females	Persons	Males	Females
0-	9,287	4,771	4,516	1,668	888	780
Per Cent	12	12	14	16	17	15
5-	8,864	4,795	4,069	1,547	754	793
Per Cent	13	12	12	15	14	15
10-	8,644	4,651	3,993	1,363	692	671
Per Cent	12	12	12	13	13	13
15-	8,220	4,628	3,592	1,163	552	611
Per Cent	11	12	11	11	10	12
20-	24,833	13,884	10,949	3,230	1,613	1,617
Per Cent	34	35	33	30	30	30
40-	9,936	5,421	4,515	1,363	702	661
Per Cent	14	14	14	13	14	12
60-	2,708	1,316	1,392	256	112	144
Per Cent	4	3	4	2	2	3
Total	72,492	1,316	1,392	10,590	5,313	5,277
	100	100	100	100	100	100

TABLE 11. AGE, SEX AND MARITAL STATUS OF THE 1931 CENSUS AND THE HOUSE SAMPLE POPULATION OF KOLHAPUR CITY
1931 CENSUS

Age Group	UNMARRIED			MARRIED			WIDOWED		
	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
0-	9,246	4,744	4,502	38	25	13	3	2	1
5-	8,413	4,724	3,689	439	68	371	12	7	9
10-	7,257	4,465	2,792	1,353	179	1,174	34	24	27
15-	3,765	3,329	436	4,314	1,267	3,047	141	32	109
20-	3,359	3,069	290	18,929	10,250	8,679	2,545	565	1,980
40-	208	145	63	6,103	4,402	1,701	3,625	874	2,751
60-	37	19	18	978	816	162	1,693	481	1,212
Total	32,285	20,495	11,790	32,154	17,007	15,147	8,053	1,964	6,089
	HOUSE			SAMPLE					
0-	1,668	888	780	—	—	—	—	—	—
5-	1,546	754	792	1	—	1	—	—	—
10-	1,272	690	582	90	2	88	—	—	—
15-	593	473	120	557	77	480	9	2	7
20-	354	313	41	2,592	1,244	1,348	273	56	217
40-	61	56	5	772	533	239	528	113	415
60-	3	3	—	83	71	12	170	38	132
Total	5,497	3,177	2,320	4,095	1,927	2,168*	980	209	771

*Excluding 18 cases whose marital status was ambiguous, e.g. prostitutes, etc.

The proportion of the unmarried in the House Sample population is much higher than in the 1931 Census popula-

tion. In 1931, 52.5 per cent of the males and 35 per cent of the females were unmarried. In the House Sample population these percentages were respectively 60 and 43.5. The magnitude of change in the case of both the sexes is almost equal and the direction of the change is also the same. There is a corresponding drop in the married population among males. The females recorded declines of only 5 per cent among the married and of 3 per cent among the widows. The proportion of widowers in both the populations is almost the same.

An examination of the age composition of the "married" and the "unmarried" in both the populations shows that the proportion of the unmarried among males in the House Sample population had sharply increased in the age group 0-15, while their proportion had declined slightly in the age groups 15-20, and more sharply in the age group 20-40. Taking into account the peculiarities of the House Sample as contrasted with the Census population, these figures would generally indicate that the proportion of the unmarried had increased in the earlier age groups. This is also seen from the statistics regarding married males. Among married females in the House Sample as compared with the Census population, the decline in the age group 5-15 is marked. Generally, therefore, in the case of females also, the number of unmarried has increased in the earlier age groups.

Altogether these statistics indicate a general rise in the age at marriage among both males and females. A more extensive investigation and discussion of this phenomenon will be found in Section III.

Table 12 gives the classification of the House Sample and the 1941 Census populations by communities.

The proportion of various communities in the populations is seen to be broadly the same. While the percentage of Marathas in the 1941 Census population was 49.5, it was only 43.0 in the House Sample population. The difference is due to the different classification adopted in regard to the latter. In the House Sample population such artisan classes as potters (Maratha Kumbhar), carpenters (Maratha Sutar), etc., who are generally classified in the Census as Marathas, were separately grouped and were not included in the Mara-

TABLE 12. CLASSIFICATION OF THE HOUSE SAMPLE AND THE 1941 CENSUS POPULATION OF KOLHAPUR CITY BY COMMUNITIES

	HINDUS						Jains	Muslims	Christians	Others	Total
	Marathas	Brahmins	Harijans	Lingayats	Other Hindus	Total Hindus					
House Sample	45,640 43.0	16,850 15.9	5,120 4.8	3,000 2.8	18,930 17.8	89,540 84.0	4,750 4.5	10,920 10.0	690 6.5	—	1,05,900 100.0
1941 Census	47,463 49.5	12,585 13.1	5,132 5.3	2,435 2.5	12,243 12.7	79,858 83.1	5,481 5.7	9,247 9.8	1,316 1.4	16 —	95,918 100.0

thas. Hence the smaller percentage of Marathas in the House Sample population. The higher percentage of Christians in the House Sample population cannot be satisfactorily explained.

3. Age, Sex and Civil Condition in Different Wards.—Table 13 sets out the information regarding the age, sex and marital condition of the House Sample population classified by wards.

It will be at once obvious that the wards do not differ from one another very materially in regard to population, sex ratio, age composition or marital status. The variations as revealed by the table are only incidental to the random sample. This non-variability springs from the arbitrary character of the ward boundaries. The wards do not represent divisions of the city having any historical, social or economic significance. They are merely arbitrary divisions for administrative purposes and solely made to serve that convenience. No detailed comments are called for. Attention is directed to certain facts in the following: The sex ratio is lowest in E ward, being 950 females to 1,000 males, and highest in C, 1,020 females to 1,000 males. The total range of the variation is, however, relatively insignificant. The age distribution between different wards shows no marked differences. Only in the case of females in E ward, the age composition is somewhat different from that in the other wards. The proportion of females in the age group 15-45 was 48.2 in this ward and only 43.2 in B ward, while it averaged 46 in the other three wards. No explanation for this can be of-

TABLE 13. DISTRIBUTION OF THE HOUSE SAMPLE POPULATION IN THE WARDS BY AGE, SEX AND CIVIL CONDITION

Ward	Age Group	MALES				FEMALES					PERSONS				
		Unmarried	Married	Widowed	Total	Unmarried	Married	Widowed	Others*	Total	Unmarried	Married	Widowed	Others*	Total
A	1-15	471	—	—	471	459	13	—	—	472	930	13	—	—	943
	16-45	159	278	19	456	26	364	79	—	469	185	642	92	—	919
	46 and over	2	100	25	127	—	29	104	—	133	2	129	129	—	260
	Total	632	378	44	1,054	485	406	177	—	1,068	1,117	784	221	—	2,122
B	1-15	442	—	—	442	395	22	—	1	418	837	22	—	1	860
	16-45	147	308	18	473	34	379	57	10	480	181	667	75	10	953
	46 and over	4	93	21	118	—	28	84	—	112	4	121	105	—	290
	Total	593	401	39	1,033	429	429	141	11	1,010	1,022	799	179	11	2,049
C	1-15	470	2	—	472	442	22	—	—	464	912	24	—	—	936
	16-45	150	295	15	460	43	384	70	—	497	193	679	85	—	957
	46 and over	7	76	28	111	—	24	75	—	99	7	100	103	—	210
	Total	627	373	43	1,043	485	430	145	—	1,060	1,112	803	188	—	2,103
D	1-15	458	—	—	458	448	19	—	—	467	906	19	—	—	925
	16-45	152	326	15	493	28	390	62	6	486	180	716	77	6	979
	46 and over	3	78	32	113	2	18	94	1	113	5	96	26	1	228
	Total	613	404	47	1,064	478	427	156	7	1,068	1,091	831	203	7	2,132
E	1-15	491	—	—	491	410	13	—	—	423	901	13	—	—	914
	16-45	199	298	17	514	33	424	62	—	519	232	722	79	—	1,033
	46 and over	22	73	19	114	—	39	90	—	129	22	112	109	—	243
	Total	712	371	36	1,119	443	476	152	—	1,071	1,155	847	188	—	2,190
Total	1-15	2,332	2	—	2,334	2,154	89	—	1	2,244	4,486	91	—	1	4,578
	16-45	807	1,505	84	2,396	164	1,941	324	16	2,445	971	3,446	408	16	4,841
	46 and over	38	420	125	583	2	138	447	1	588	40	538	572	1	1,171
	Total	3,177	1,927	209	5,313	2,320	2,168	771	18	5,277	5,497	4,095	960	18	10,590

*Women whose marital status is ambiguous, i.e., prostitutes, concubines, etc.

ferred. The percentage of the total married, unmarried and widowed are closely similar in all wards. The percentage of unmarried males was highest, 63.4, in E ward and lowest, 57.0, in B ward. The percentage of married females was highest, 44, in E ward and lowest, 38, in A ward.

SECTION III: THE FERTILITY SURVEY

1. **Scope, Method and Procedure.**—In planning the fertility survey an initial choice had to be made between the two possible types of surveys. One type consists of the detailed recording of the fertility history of all women in the sample chosen irrespective of age. This amounts to the recording of the fertility performance of all women during the whole of their reproductive period. The second type consists in gathering information regarding the fertility of women in the reproductive age groups, say 13 to 50 years, during a specific period of 2 or 3 or 5 years. The first type of inquiry is more useful in analysing and determining the various long term influences that determine and affect human fertility. On the other hand, it relates itself to a very extensive period; i.e. the information collected with regard to all the women in the sample chosen belongs to a period which might exceed 50, 60 or even 70 years, as women of these ages are also eligible for inclusion in the sample. The averaging of the data for this extensive period might conceal much more than it might reveal. This is a serious draw-back of this type of inquiry. It is also more difficult to carry out as it is necessary to gather data relating to a very long period. People's memories are proverbially short and the possibilities of getting wrong information increase manifold if the data over a longer period than, say, the preceding 2 or 3 years, is attempted to be gathered.

We chose the second type of inquiry as more suitable, because it concerns itself with the fertility history of the period which is comparatively fresh in the memory of the people. The total number of questionnaires to be filled in is also reduced in this type of inquiry as, instead of all the women in the sample, information regarding women in the reproductive age groups only need be gathered.

We had to think beforehand of the difficulties that we might meet with in attempting this sort of survey. In the first instance we were not sure as to the response that we might get from the public. It was obviously necessary, in gathering the sort of information we wanted, to contact the women folk in the sample families. Women investigators were obviously

more suitable for this job. We were able to recruit 10 female primary teachers for this purpose. For ensuring public response to a certain extent, a committee of 7 women prominent in the social life of the city was formed to help us.

We had next to decide on certain measures for avoiding some of the difficulties that we feared would be encountered. The greatest difficulty we imagined (and correctly as experience showed) was with regard to the recording of individual ages. Experience in India showed that the recording of ages was all along very defective in all such inquiries. It was necessary to guard against this or alternatively, if it was inevitable, as it actually proved in the circumstances, to take steps to reduce mis-statements of individual ages as far as possible. Here we were up against the fact that the people at large did not mis-state their age deliberately; the mis-statements arose out of sheer ignorance about their own ages. The people concerned did not know their ages. Their estimate of their own age ranged between 2 to 4 years on either side of the actual correct age. We could at best try to eliminate this range on either side. The questionnaire asked for information regarding the present age of the woman between 13 and 50, her age at marriage, the present age of her husband, etc. It was necessary for the success of the inquiry that these ages be recorded fairly accurately. With a view to help to determine and record correct ages, we decided to use a device which had partially been used by Dr. Kakade in the survey of the weaving communities in Sholapur.¹ This was an attempt to revive the associative memories of the people. The common mass of people did not remember, or did not really bother to remember, the age at which they were married or the age at which the first child was born. These events, however, were subconsciously associated in their minds with certain public events in the city or in the neighbourhood. Thus, if the age at marriage of a woman was to be ascertained, she could be persuaded to try to remember whether her marriage or the birth of her first child was associated with any public event in the locality, and she would respond in some such way as, "I was married in the same year in which X (some prominent person in the city) died." By thus reviving associative memories many

¹ Cf. "Socio-Economic Survey of Weaving Communities in Sholapur." R. G. Kakade, Publication No. 14, Gokhale Institute of Politics and Economics, 1947, p. 120.

an error in the recording of age could be avoided. We prepared, with the aid of the committee of women mentioned earlier, a list of prominent events in the life of the city and its people during the preceding half century. Copies of this list were given to our investigators for ready reference. Many of them had frequent occasion to refer to the list and they reported that it helped them in many instances to fix correct ages and dates. This method, however, could not be expected to be a corrective for all mis-statements of age. It is of limited potentiality and we do not make any greater claims for it than it actually deserves. It was a useful method and it did serve as a corrective to mis-statements of age in several cases.

A translation of the questionnaire used for this survey is printed at the end of Section III, Appendix I. The questionnaire was devised to cover a period of 5 years preceding the inquiry. It sought to collect information regarding the fertility performance of women between 13 and 50 years of age. It recorded all births, incomplete, single and multiple, occurring during those 5 years, to women in the sample families who were between 13 and 50 years of age at the time of the inquiry. The sex of the child was noted in all cases as well as the rank of the delivery reported. Regarding each woman in the age group 13-50 years included in the sample, information regarding present age, age at marriage, education, marital status, profession and income was collected. In the case of the widowed, married and re-married women, information regarding the age, profession and income of husbands was also sought. The fertile period of the Indian female usually begins and ends earlier than in the West. It is usually taken to begin by about the thirteenth year and to end by about the forty-fifth year.² The fertility questionnaire sought to gather information regarding women between the age group 13-50. The extension of the end-period by 5 years was necessary in view of the fact that a period of 5 years was sought to be covered by the questionnaire. If we had confined ourselves to women who were between 13 to 45 years of age at the time of the inquiry, that would have taken out of our purview women who were in the age group 45 to 50 in 1945 and in consequence the fer-

²Cf. Cochin, "A Study in Differential Fertility," Ram Varma. (An unpublished doctoral dissertation of the University of Bombay, 1937.) Census of India, Travancore, 1941, p. 7.

more suitable for this job. We were able to recruit 10 female primary teachers for this purpose. For ensuring public response to a certain extent, a committee of 7 women prominent in the social life of the city was formed to help us.

We had next to decide on certain measures for avoiding some of the difficulties that we feared would be encountered. The greatest difficulty we imagined (and correctly as experience showed) was with regard to the recording of individual ages. Experience in India showed that the recording of ages was all along very defective in all such inquiries. It was necessary to guard against this or alternatively, if it was inevitable, as it actually proved in the circumstances, to take steps to reduce mis-statements of individual ages as far as possible. Here we were up against the fact that the people at large did not mis-state their age deliberately; the mis-statements arose out of sheer ignorance about their own ages. The people concerned did not know their ages. Their estimate of their own age ranged between 2 to 4 years on either side of the actual correct age. We could at best try to eliminate this range on either side. The questionnaire asked for information regarding the present age of the woman between 13 and 50, her age at marriage, the present age of her husband, etc. It was necessary for the success of the inquiry that these ages be recorded fairly accurately. With a view to help to determine and record correct ages, we decided to use a device which had partially been used by Dr. Kakade in the survey of the weaving communities in Sholapur.¹ This was an attempt to revive the associative memories of the people. The common mass of people did not remember, or did not really bother to remember, the age at which they were married or the age at which the first child was born. These events, however, were subconsciously associated in their minds with certain public events in the city or in the neighbourhood. Thus, if the age at marriage of a woman was to be ascertained, she could be persuaded to try to remember whether her marriage or the birth of her first child was associated with any public event in the locality, and she would respond in some such way as, "I was married in the same year in which X (some prominent person in the city) died." By thus reviving associative memories many

¹ Cf. "Socio-Economic Survey of Weaving Communities in Sholapur." R. G. Kakade, Publication No. 14, Gokhale Institute of Politics and Economics, 1947, p. 120.

an error in the recording of age could be avoided. We prepared, with the aid of the committee of women mentioned earlier, a list of prominent events in the life of the city and its people during the preceding half century. Copies of this list were given to our investigators for ready reference. Many of them had frequent occasion to refer to the list and they reported that it helped them in many instances to fix correct ages and dates. This method, however, could not be expected to be a corrective for all mis-statements of age. It is of limited potentiality and we do not make any greater claims for it than it actually deserves. It was a useful method and it did serve as a corrective to mis-statements of age in several cases.

A translation of the questionnaire used for this survey is printed at the end of Section III, Appendix I. The questionnaire was devised to cover a period of 5 years preceding the inquiry. It sought to collect information regarding the fertility performance of women between 13 and 50 years of age. It recorded all births, incomplete, single and multiple, occurring during those 5 years, to women in the sample families who were between 13 and 50 years of age at the time of the inquiry. The sex of the child was noted in all cases as well as the rank of the delivery reported. Regarding each woman in the age group 13-50 years included in the sample, information regarding present age, age at marriage, education, marital status, profession and income was collected. In the case of the widowed, married and re-married women, information regarding the age, profession and income of husbands was also sought. The fertile period of the Indian female usually begins and ends earlier than in the West. It is usually taken to begin by about the thirteenth year and to end by about the forty-fifth year.² The fertility questionnaire sought to gather information regarding women between the age group 13-50. The extension of the end-period by 5 years was necessary in view of the fact that a period of 5 years was sought to be covered by the questionnaire. If we had confined ourselves to women who were between 13 to 45 years of age at the time of the inquiry, that would have taken out of our purview women who were in the age group 45 to 50 in 1945 and in consequence the fer-

²Cf. Cochin, "A Study in Differential Fertility." Ram Varma. (An unpublished doctoral dissertation of the University of Bombay, 1937.) *Census of India, Travancore*, 1941, p. 7.

tility data regarding those who were 45 years of age in 1941, 1942, 1943 and 1944, would have been lost. The total information gathered would have been to that extent deficient. Regarding the families in the sample, the questionnaire sought to gather information about the total number of members in the family by broad age groups, the living space at their disposal, their income, their caste and subcaste, etc.

We had, as a part of the Socio-Economic Survey of the city, already launched an inquiry in regard to families in the city. This has been fully described in Section II. For the fertility inquiry we did not think of varying the sample. We allotted the house numbers that were selected for the other inquiry among the women investigators recruited for the fertility inquiry and instructed them to collect information regarding all the families resident in those houses. This decision was advantageous in two ways. Firstly, the fertility questionnaire could be made very much shorter and simpler than it would have been otherwise feasible because the information regarding the very same families was being gathered by means of a separate and a more detailed questionnaire. The fertility questionnaire, therefore, could confine itself to the barest minimum of information regarding the family and concentrate on the collection of data regarding fertility. Secondly, some of the questions contained in the fertility questionnaire were the same as in the House Sample questionnaire. The information was, however, collected by two separate agencies. They thus served as a check on each other and information on many a point in the two questionnaires covering the same aspects could be compared and the correctness or otherwise of the information ascertained. It should be remembered in this connection that the women investigators usually contacted and obtained information from the women folk of the family. The enumerator working on the family survey schedule, on the other hand, contacted male members in the family and got his information from them. The fertility survey covered the same house numbers as the House Sample inquiry. The fertility inquiry was launched two months after the House Sample inquiry began. During the interval, the vast programme of city development that was referred to in Section II was in full swing. Many houses were being acquired and demolished and resident families were also

shifting on a rather large scale. As a consequence the fertility inquiry covered only 1,946 families, i.e., 168 families less than the House Sample inquiry. This was unavoidable. It should, however, be stated that all the families covered by the fertility inquiry were also covered by the House Sample inquiry. As a result the two samples differed to the extent of only 168 families.

The survey was launched at the end of December 1945. The women enumerators were invited to a preliminary conference where the questionnaire was fully explained to them. Each of them was asked to fill in 5 to 10 questionnaires as a sort of training. These questionnaires were examined critically the next day and the mistakes that were being committed were explained to each enumerator. The enumerators were paid at the rate of As. 4 per questionnaire correctly filled in. No questionnaire was admitted as correct unless checked for consistency, precision, etc. About 5 per cent of the questionnaires were re-checked by the Chief Investigator by revisiting the families in question. The survey was completed in June 1946. A total of 1,946 families was covered by it.

The data gathered were tabulated after being checked for internal consistency. This is a proper place for recording the deficiencies of the data that were gathered. Firstly, we were not successful in eliminating the usual lumping of age returns at 5 year age intervals. The information showed that the age returns were greatly biased in regard to such individual age years as 15, 20, 25, etc. This defect of the data, however, did not arise out of any carelessness on our part. We had taken all precautions and, as noted previously, had done everything in our power to ensure correct age returns. As we have noted previously, the defect of the age returns really arose from total ignorance of the general mass of people regarding age. This is a common occurrence in India. In the Indian Census returns and even in a careful inquiry, as the one carried out by Dr. Rama Varma in Cochin, this lumping effect could not be avoided. It can be eliminated by various statistical devices and the data made to correspond much more to reality. All these steps have been described at the proper place.

Another defect of the data arose out of the limitations of our enumerators. The questionnaire, among other things,

sought information regarding living space. In many cases the enumerators had to make an estimate of the total area used by a family, when family members were not able to give the living space in some such commonly known measure as the "khan." The "khan" again did not mean, even approximately, the same amount of area in different wards of the city or even in the same ward. In the majority of instances therefore, in recording area the enumerators had to make estimates. The estimates that were actually made differed so widely from enumerator to enumerator that it was impossible to bring any uniformity into them. The information regarding living space, therefore, had to be written off as not reliable.

The first defect noted was not intractable and has been largely eliminated by well known statistical devices. The second could not be remedied in any way. All the information gathered on this point had to be rejected. The rejected information was not, however, of such a nature as materially to affect the total information collected regarding fertility and did not affect the success of the inquiry.

It would also be proper to note at this stage a side issue. The fertility schedule, among other things, also sought information regarding the practice of contraception among the women in the sample. The regular use of contraceptives was reported in 3 cases only. Even allowing for incomplete recording on this point, there is no reason to believe that contraception was practised to any significant extent in Kolhapur City. The fertility data presented in the subsequent pages, therefore, show fertility almost wholly unaffected by the practice of contraception.

2. **Sample Women.**—In the 1,946 families covered by the inquiry, there was a total of 2,825 women between the ages of 13 and 50 years. In 53 families no women between these ages were found. Table 14 shows the distribution of these women among different castes and age groups.

At the time of the inquiry, 328 out of the 2,825 sample women were unmarried, 390 were widows and 2,019 were married. The marital status of the remaining 88 was ambiguous. They included concubines, prostitutes, as well as women

TABLE 14. DISTRIBUTION OF SAMPLE WOMEN BY AGE GROUPS AND BY CASTES AND COMMUNITIES

Age Group	No. of Sample Women	Caste	No. of Sample Women
-15	333	Marathas	1,398
16-20	496	Brahmins	471
21-25	562	Misc. Marathas	214
26-30	430	Harijans	142
31-35	324	Muslims	266
36-40	296	Jains	129
41-45	204	Others	205
46-50	180		
Total	2,825	Total	2,825

indulging in other types of extra-marital relations. There were, also, a few divorced and deserted women among these.

3. **Record of Births.**—A total of 1,843 deliveries were reported as having taken place during 1941-45 among the 2,825 sample women. In vital statistics "a birth means both the act of bringing forth a child or more (in case of twins, etc.) and the fact of a child being born."³ So that by the number of births is indicated either the number of total confinements or the number of children live-born. We have adopted the first definition in our analysis and every delivery has been taken to represent a birth.

Of the 1,843 births recorded, 458 were reported to have occurred during 1945, 338 during 1944, 389 during 1943, 322 during 1942, and 336 during 1941. For various technical and other cogent reasons, we decided to treat all the births occurring during the period 1941-45 as a whole instead of treating separately births occurring in each single year, for the calculation of specific fertility rates. The various statistical and other problems involved are discussed in detail in Appendix II, Note 1.

4. **Eligible Women.**—If, however, births were to be treated as a whole for the calculations of the age specific fertility rates of married women, they could not be obviously related to the 2,019 women in the sample who were recorded as married at the time of the inquiry; for a number of them had entered matrimony some time during the five years covered by the inquiry and had consequently spent a part

³"Measurement of Population Growth," Kuczynski, 1935, p. 15.
S. S. K. F.—4

of that period as unmarried. It was necessary to take into account only those who had got married before 1941 and who remained married throughout the five-year period (1st January, 1941 to 31st December, 1945) covered by the inquiry. These may be conveniently described as eligible women. Even from among these it was necessary to exclude those who were separated from their husbands because of war service, etc., for a considerable stretch of time during this period. Eligible women were thus women who were married before 1941 and were not widows in 1945, those therefore who were open to the chance of pregnancy and delivery during all the five years covered by the inquiry. These and the births occurring among them during the five-year period could only be used for calculating the specific fertility rates of married women. In Table 15 the 2,825 sample women are classified by quinquennial age groups and by the different causes determining their eligibility in the above sense.

TABLE 15. CLASSIFICATION OF SAMPLE WOMEN BY AGE GROUPS AND BY CAUSES DETERMINING THEIR ELIGIBILITY

Age in 1945	Women Unmarried in 1940	Widows in 1945	Other Cases of Ineligibility	Women Who Were Leading an Active Fertile Life Throughout 1941-1945	Total
-15	333	—	—	—	333
16-20	287	6	11	192	496
21-25	53	22	21	466	562
26-30	8	36	17	369	430
31-35	3	53	16	252	324
36-40	2	81	15	198	296
41-45	—	91	5	108	204
46-50	—	101	3	76	180
Total	686	390	88	1,661	2,825

Of the 2,825 sample women, 686 were unmarried in 1940, i.e., at the end of 1940, and therefore at the beginning of 1941, and 390 were widows in 1945. That group of 88 women of ambiguous marital status was a heterogeneous group and defied further classification. For this and other cogent reasons it was decided to treat this group as non-eligible. In the case of two married women the husbands were reported to have been away on war service during most of the period covered by the inquiry. These two had, therefore, to be excluded. The total number of eligible women thus came to 1,659.

5. **Age Distribution of Eligible Women.**—The 1,659 eligible women are distributed by single age year groups according to their ages at the time of the inquiry in Table 16.

TABLE 16. DISTRIBUTION OF ELIGIBLE WOMEN IN THE SAMPLE BY SINGLE AGE-YEARS

Age	No. of Women	Age	No. of Women	Age	No. of Women	Age	No. of Women	Age	No. of Women
16	7	24	37	32	62	40	144	48	20
17	3	25	261	33	11	41	1	49	10
18	34	26	29	34	9	42	13	50	36
19	22	27	40	35	161	43	4		
20	126	28	41	36	20	44	6	Total	1,659
21	30	29	22	37	9	45	84		
22	105	30	237	38	22	46	2		
23	32	31	9	39	3	47	7		

The table shows the usual features of age returns in India. There is a heavy concentration at quinquennial ages such as 20, 25, 30, 35, etc. So also, though to a lesser extent, there is a certain bias in favour of even ages, like 18, 22, 24, 28, etc. As remarked earlier, this defective character of age returns was inevitable as it largely arose out of the vague ideas of the general run of people regarding their own ages. For eliminating this defect the only practical remedy was to group the eligible women in quinquennial age groups. Any graduation of age returns was out of account as it created another indissoluble problem; for even though a more realistic age distribution of the eligible women could be obtained by graduating the age returns, that could give no indication as to how the number of births was to be distributed among them.

6. **Specific Fertility Rates.**—As already indicated, we have derived the specific fertility rates by considering the total births occurring during the whole five-year period. Thus, for instance, to 192 women in the age-group 16-20 were born a total of 212 children during the five years. From this is worked out the average number of births per annum per 1,000 women. This specific fertility rate is attributed to age 16, that being the mid-age of the group in the mid-year of the investigation period, namely, 1943. In the same manner, from the total births occurring to women in the other age groups are derived the fertility rates attributable to ages 21, 26, 31, 41 and 46 respectively. These are set out in Table 17. For details regarding the derivation of these rates

reference is made to the Appendix II, Note 1. In Table 17, are also given specific fertility rates for Cochin and Travancore, for facility of comparison.

TABLE 17. SPECIFIC FERTILITY RATES OF MARRIED WOMEN BY QUINQUENNIAL AGE GROUPS IN KOLHAPUR CITY, TRAVANCORE* AND COCHIN[†]

Age Group	Kolhapur 1946	Age Group	Travancore 1941	Cochin 1937
16-20	221	15-19	230	224
21-25	263	20-24	247	249
26-30	243	25-29	222	253
31-35	192	30-34	167	246
36-40	116	35-39	141	182
41-45	43	40-44	45	120
46-50	8	45-49	15	—

It should be noted that while the specific fertility rates in Travancore and Cochin are attributable to the mid-year of the various age groups, in the case of Kolhapur City, because of the five-year period covered by the inquiry, the mid-year of an age group is shifted 2 years backward from the normal one. Thus, while the specific fertility rate of 221 for the age group 16-20 is attributable to the age year 16 in Kolhapur, the specific fertility rate of 230 for the age group 15-19 in Travancore is attributable to the age year 17, the mid-year of the age group.

The specific fertility rates in Kolhapur display the usual features associated with specific fertility rates everywhere. A comparison with the Travancore and Cochin rates would show that the general levels of fertility in all the three are fairly close to one another. The pattern of the fertility curve in Kolhapur, however, conforms much more to that of Travancore. Both begin at a fairly low level and reach the peak, Kolhapur in the age group 21-25, and Travancore in the age group 20-24; then there is a gradual decline, which becomes faster and sharper after the 35th year. In contrast, the Cochin fertility curve starts from a similar initial position as the other two, is almost steady over the three age groups between 21 and 35 years, followed by a decline which is not

* Census of India, Travancore, 1941, p. 183.

† Rama Varma: Cochin: "A Study in Differential Fertility," (unpublished doctoral dissertation of the University of Bombay, 1937).

as sharp or rapid as that in Kolhapur and Travancore. Why does the Cochin curve show a different pattern? It is difficult to answer the question. The Cochin rates show a suspicious degree of stability over the three age groups from 21 to 35 years. It is difficult to believe in fertility remaining so stable over these age groups. Whether the abnormality observed is due to any bias in sampling or any other cause is not known.

7. **Single Age-Year Specific Fertility Rates.**—From the quinquennial fertility rates given in Table 19, the specific fertility rates for each individual age were worked out by graphical interpolation. These are given in Table 18 which also embodies similar rates for Travancore.

TABLE 18. SINGLE AGE-YEAR SPECIFIC FERTILITY RATES FOR MARRIED WOMEN IN KOLHAPUR CITY AND TRAVANCORE*

Age	Specific Fertility Per 1,000 Married Women	
	Kolhapur	Travancore
12	—	—
13	—	—
14	100	—
15	170	222
16	221	226
17	238	229
18	250	232
19	257	235
20	262	237
21	263	240
22	263	244
23	261	246
24	257	248
25	251	245
26	243	240
27	235	231
28	224	221
29	213	211
30	203	200
31	192	192
32	176	185
33	164	176
34	149	163
35	133	154
36	116	144
37	99	130
38	82	115
39	68	100
40	55	87
41	43	72
42	35	54
43	27	45
44	20	37
45	13	30
46	8	24
47	3	19
48	—	14
49	—	7
50	—	2

*Census of India, Travancore, 1941, p. 183.

8. **Net Reproduction Rate.**—The next step is to calculate the net reproduction rate for which it is necessary to

take account of mortality conditions. This is usually done by using a life table. In regard to Kolhapur, we could use the life tables of the Bombay Presidency prepared in 1931. In Table 19 the net reproduction rate derived by using this life table is presented.

If all the girls born today, surviving as per the life table rates at various ages, get married, the net reproduction rate in Kolhapur City comes to 1.15.

TABLE 19. CALCULATION OF THE GROSS AND NET REPRODUCTION RATES IN KOLHAPUR CITY

Age	Children Born Per 1,000 Married Women	Of 1,000 Females Born Living at Ages	Children Born to the Hypothetical Females	Age	Children Born Per 1,000 Married Women	Of 1,000 Females Born Living at Ages	Children Born to the Hypothetical Females
13	—	558	—	36	116	358	41.5
14	100	552	55.2	37	99	348	34.5
15	170	545	92.7	38	82	339	27.8
16	221	538	118.9	39	68	329	22.4
17	238	530	126.1	40	55	320	17.6
18	250	522	130.5	41	43	311	13.4
19	257	514	132.1	42	35	301	10.5
20	262	506	132.6	43	27	292	7.9
21	263	497	130.7	44	20	283	5.7
22	263	488	128.3	45	13	274	3.6
23	261	479	125.0	46	8	265	2.1
24	257	470	120.8	47	3	256	0.8
25	251	461	115.7	48	—	247	—
26	243	452	109.8	49	—	238	—
27	235	442	103.9	50	—	229	—
28	224	433	97.0				
29	213	424	90.3	Total	5,296	—	2,397.6
30	203	414	84.0	Female			
31	192	405	77.8	births	2,542		
32	178	395	70.3	(being 48% of total births)	1,150.8		
33	164	386	63.3	Gross			
34	149	376	56.0	Reproduction			
35	133	367	48.8	Rate	2.54		
				Net Reproduction Rate			1.15

9. **Factors Affecting Fertility.**—We now proceed to analyse the effects of various factors which do, or are supposed to, affect the fertility of a population. Below we discuss the effect of nine such factors in respect of our sample. These factors can be grouped into two categories: (1) Sociobiological factors and (2) Economic factors. In the first category are included (a) The age of the mother; (b) The age of the father; (c) The duration of marriage; (d) The age at marriage and (e) The caste. In the second category are (f) Income; (g) Profession of the father and (h) Profession of the mother. These are discussed seriatim in the following:

(a) **Age of the Mother:** In computing the specific fertility rates, the only factor affecting fertility that is taken into account is the age of the mother. It is generally and rightly taken to be the most important factor, among all the others, that influence fertility. Yet, to what precise extent is the variation in the specific fertility rates due to the age of the mother? For this it is necessary to approach the problem from a slightly different angle, i.e., to analyse the variation in the number of births occurring to each woman in the sample during the period of investigation. In Table 20 the distribution of 1,659 women in the sample divided into quinquennial age groups and grouped according to the number of births occurring to each of them during 1941-45, is set out.

TABLE 20. THE CLASSIFICATION OF ELIGIBLE WOMEN IN THE SAMPLE BY AGE GROUPS AND THE NUMBER OF BIRTHS OCCURRING TO EACH

Age Group	The Number of Births Occurring to the Women in the Period 1941-1945						Total Births
	0	1	2	3	4	5	
16-20	55	74	51	12	—	—	192
21-25	102	158	166	35	3	1	465
26-30	105	114	118	29	3	—	369
31-35	107	69	58	15	3	—	252
36-40	118	49	27	4	—	—	198
41-45	87	19	2	—	—	—	108
46-50	72	3	—	—	—	—	75
Total	646	486	422	95	9	1	1,659

It would be observed that of the 1,659 women in the sample, about 40 per cent bore no child during 1941-45, 30 per cent had one child each, 26 per cent 2 and 5 per cent 3 children each. To 9 women, 4 children each were born during the period, and there was a single instance in which the woman had children at the rate of one per year. This variation we may now proceed to analyse into two components, one due to the fact that the women were of different ages and the other due to all other causes. This is presented in Table 21 in the standard form of the analysis of variance, and measures in a sense the influence of the age factor as against all the other factors affecting fertility.

It should be observed that the age of the mother is the most important factor affecting fertility and accounts for a large portion of the total variation in the specific fertility rates. In evaluating the effect of other factors on fertility, it is obviously necessary to eliminate the effect of the age of the

TABLE 21. ANALYSIS OF VARIANCE

Due to	Sum of Squares	Degrees of Freedom	Mean Sum of Squares
Total Variation	1,545	1,658	—
Between Quinquennial Age Groups	281	6	46.83
Within Quinquennial Age Groups	1,264	1,652	0.77

mother. This is sought to be done in the tables that follow by comparing the actually recorded number of children to groups of women distributed according to the other factor under consideration, with the number of children expected to be born to the same women if only their age composition is taken into account. The difference between the "observed" and the "expected" broadly shows the variation in fertility due to the other factor under consideration after the effect of the present age is eliminated. This difference, however, might be at times the result of the peculiarity of the particular sample chosen or what is technically known as sampling variation. The statistical procedure for evaluating this is to calculate the probability that the observed deviation between two series might have arisen from mere chance coincidence. In case such probability is found to be very small, it can be inferred that the observed differences are due to real effects of the factor under consideration rather than mere chance coincidence. A compact measure of the deviation of the observed series from the expected one is afforded by the statistical measure known as the Chi-square (goodness of fit of observation to theory). In the following discussion this measure has been used everywhere to test the statistical significance of variations in fertility rates arising from various factors. (See Note 2, Appendix II.)

(b) **The Age of the Father:** The age of the father is a factor which is known to influence fertility. The data furnished by the fertility inquiry at the 1931 Census in Travancore and Baroda showed that the larger the disparity of ages of the parents the fewer the children.⁶ The statement refers, it should be noted, not to children born during a specific period, but to all children born before the date of the inquiry.

⁶ Census of India, Travancore, 1931, p. 151; Census of India, Baroda, 1931, p. 178. In Travancore, the Census Superintendent also noted the following: "A strange correlation, the significance of which is not quite clear, is seen between fertility and the disparity in the ages of husbands and wives in regard to wives below 35 years of age. In such cases the maximum fertility is reached when the husband is about 40 years old, whatever the age of the wife."—Op. cit., p. 151. No such correlation was observed in Kolhapur.

TABLE 22. THE DISTRIBUTION OF ELIGIBLE WOMEN IN THE SAMPLE IN EACH AGE GROUP
 ACCORDING TO THE AGES OF THEIR HUSBANDS AND THE OBSERVED AND EXPECTED
 NUMBER OF BIRTHS OCCURRING TO THEM

Age Group	Age of Husband										Not Given	Total
	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-80		
16-20. No. of Women	4	82	80	16	7	1	1	1	—	—	—	192
Observed Births	2	78	103	20	6	2	1	0	—	—	—	—
Expected Births	4.4	90.5	88.3	17.7	7.7	1.1	1.1	1.1	—	—	—	—
21-25. No. of Women	2	22	205	173	41	10	6	—	3	—	3	465
Observed Births	2	17	278	242	50	13	6	—	0	—	4	—
Expected Births	2.6	28.9	269.8	227.7	53.9	13.2	7.9	—	3.9	—	—	—
26-30. No. of Women	—	1	15	125	147	51	21	5	3	—	1	369
Observed Births	—	1	19	155	183	55	26	5	4	—	1	—
Expected Births	—	1.2	18.3	152.1	178.9	62.1	25.6	6.1	3.7	—	—	—
31-35. No. of Women	—	—	—	8	97	96	37	7	3	4	—	252
Observed Births	—	—	—	10	105	69	31	4	3	0	—	—
Expected Births	—	—	—	7.7	93.1	92.2	35.5	6.7	2.9	3.9	—	—
36-40. No. of Women	—	—	—	—	10	53	82	34	14	4	1	198
Observed Births	—	—	—	—	4	41	49	9	7	2	3	—
Expected Births	—	—	—	—	5.8	80.8	47.6	19.7	8.1	2.3	—	—
41-45 No. of Women	—	—	—	—	—	3	36	45	18	6	—	108
Observed Births	—	—	—	—	—	3	13	5	2	0	—	—
Expected Births	—	—	—	—	—	0.6	7.7	9.6	3.8	1.7	—	—
46-50. No. of Women	—	—	—	—	—	—	2	15	42	16	—	75
Observed Births	—	—	—	—	—	—	0	0	2	1	—	—
Expected Births	—	—	—	—	—	—	0.1	0.6	1.7	0.6	—	—
Total	6	105	300	322	302	214	185	107	83	30	5	1,659
Observed Births	4	96	400	427	348	203	126	23	18	3	8	1,656
Expected Births	7.0	120.6	375.2	405.2	341.4	200.0	125.5	43.8	24.1	8.4	5.7	1,657
Chi-Square	1.29	5.02	1.64	1.17	1.47	.05	.00	8.42	1.54	3.56	—	24.16
Degrees of Freedom												9
Probability												.01-.001

The data show that if the husband is about the same age as the wife or is older than she by less than 5 years, the fertility tends to be lower than can be expected otherwise. If, however, the husband is older than the wife by 5 to 10 years, the fertility is observed to be higher than the expected. If, however, the husband is older by more than 10 years, fertility tends to be lower. Inability to deal with single age year groups makes it impossible to indicate more precisely the influence of this factor on fertility.⁷ Making use of our data, we now proceed to calculate fertility rates specific both for the age of the mother and that of the father or the age of the woman and the difference between her age and her husband's age. These are set out in Table 24. For details regarding methods reference is made to statistical Note 3 in Appendix II.

TABLE 24. FERTILITY RATES SPECIFIC FOR THE AGES OF THE MOTHER AND THE FATHER

Age of Mother	Difference of Age Between Father and Mother					.25 and More
	-0	-5	-10	-15	-20	
16-20	189	232	232	214	197	163
21-25	230	273	273	255	238	204
26-30	208	251	251	233	216	182
31-35	157	200	200	182	165	131
36-40	76	119	119	102	85	50
41-45	8	51	51	33	16	—
46-50	—	16	16	—	—	—

(c) **Duration of Marriage:** The duration of marriage is also regarded as a factor that affects fertility. In Table 25 our data are regrouped to facilitate the study of this phenomenon. It gives the distribution of eligible women in the sample by the duration of marriage and the observed and expected number of births occurring to them.

The data show that there is no significant correlation between fertility and the duration of marriage.⁸

⁷ Apart from the Chi-square values, which in both cases are significant, the fact that it is only in the central age groups that the reported number of deliveries exceed the expected number, is important. This systematic element in the deviations of an observed series from an expected one is not taken account of in the Chi-square. We did not think it worth while to measure this systematic element.

⁸ Mr. Karmel has suggested that the fertility of a woman depends not only upon her age, but upon whether she is married or not and the duration of marriage. For thus taking into consideration the effect of the fluctuations in marriage rates Mr. Karmel calculates specific fertility of women for each year of duration of marriage irrespective of age. Cf. C. Clark and B. E. Dyre, "Application and Extensions of the Karmel Formula for Reproductivity," "The Economic Record," June 1946. The Karmel Formula is, however, not very significant in relation to Indian conditions where marriage is universal and the marriage rate is fairly stable. We have not, therefore, thought it necessary to calculate fertility rates as per this formula.

TABLE 25. THE DISTRIBUTION OF ELIGIBLE WOMEN IN THE SAMPLE IN EACH AGE GROUP
 ACCORDING TO THE DURATION OF MARRIAGE AND THE OBSERVED AND THE
 EXPECTED NUMBER OF BIRTHS OCCURRING TO THEM

Age Group	Duration of Marriage (Years)													
	5	6	7	8	9	10	11	12	13	14	15	16	17	18
16-20. No. of Women	43	58	39	29	5	7	2	5	1	2	—	—	—	1
Observed Births	47	55	48	37	4	11	1	4	2	2	—	—	—	1
Expected Births	47.5	64.0	43.1	32.0	5.5	7.7	2.2	5.5	1.1	2.2	—	—	—	1.1
21-25. No. of Women	25	30	42	50	31	77	38	54	66	13	21	5	3	2
Observed Births	32	43	61	58	33	114	57	65	86	17	24	10	1	4
Expected Births	32.9	39.5	55.3	65.8	40.8	101.3	50.0	71.1	86.9	17.1	27.6	6.6	3.9	2.6
26-30. No. of Women	1	2	1	6	2	11	16	16	30	34	41	32	39	54
Observed Births	—	3	2	6	3	12	16	22	34	40	46	40	44	71
Expected Births	1.2	2.4	1.2	7.3	2.4	13.4	19.5	19.5	36.5	41.4	49.9	38.9	47.5	65.7
31-35. No. of Women	—	—	—	—	—	2	1	2	1	2	7	4	13	12
Observed Births	—	—	—	—	—	1	1	5	1	1	5	5	10	21
Expected Births	—	—	—	—	—	1.9	1.0	1.9	1.0	1.9	6.7	3.8	12.5	11.5
36-40. No. of Women	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Observed Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	0.58
41-45. No. of Women	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Observed Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—
46-50. No. of Women	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Observed Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total No. of Women	69	90	82	85	38	97	57	77	98	51	69	41	55	70
Observed Births	79	101	111	101	40	138	75	96	123	60	75	55	55	97
Expected Births	81.6	105.9	99.6	105.1	48.7	124.3	72.7	96.0	125.5	62.6	84.2	49.3	63.9	81.48
Chi-Square	.083	.223	1.305	.160	1.554	1.510	.073	.041	0.050	.108	1.005	.659	1.240	2.956
Degrees of Freedom														
Probability														

TABLE 25. (Contd.)

Age Group	Duration of Marriage (Years)													
	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16-20. No. of Women	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Observed Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-25. No. of Women	2	5	1	—	—	—	—	—	—	—	—	—	—	—
Observed Births	3	4	—	—	—	—	—	—	—	—	—	—	—	—
Expected Births	2.6	6.6	1.3	—	—	—	—	—	—	—	—	—	—	—
26-30. No. of Women	20	34	9	2	10	3	5	—	—	—	—	—	—	—
Observed Births	33	36	13	3	11	6	7	—	—	—	—	—	—	—
Expected Births	24.3	41.4	11.0	2.4	12.2	3.7	6.1	—	—	—	—	—	—	—
31-35. No. of Women	10	30	23	24	42	7	33	18	4	6	2	4	—	1
Observed Births	6	25	28	20	41	6	30	16	5	5	1	2	—	2
Expected Births	9.6	28.8	22.1	23.0	40.3	6.7	31.7	17.3	3.8	5.8	1.9	3.8	—	1.0
36-40. No. of Women	1	6	3	8	6	16	21	18	15	42	8	29	10	2
Observed Births	1	3	2	8	2	9	14	11	4	19	9	15	7	—
Expected Births	0.38	3.5	1.7	4.6	3.5	9.3	12.2	10.4	8.7	24.4	4.6	16.8	5.8	1.2
41-45. No. of Women	—	—	—	—	—	1	2	2	2	3	7	12	5	9
Observed Births	—	—	—	—	—	—	1	—	—	1	2	4	—	—
Expected Births	—	—	—	—	—	0.21	0.42	0.42	0.42	0.63	1.5	2.5	1.0	1.9
46-50. No. of Women	—	—	—	—	—	—	—	—	—	—	1	2	—	1
Observed Births	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Expected Births	—	—	—	—	—	—	—	—	—	—	0.04	0.08	—	0.04
Total No. of Women	33	75	36	34	58	27	61	38	21	51	18	47	15	13
Observed Births	43	68	43	31	54	21	52	29	9	25	13	21	7	2
Expected Births	37.08	80.3	36.1	30.0	56.0	19.91	50.42	28.12	12.92	30.83	8.04	23.18	6.8	4.14
Chi-Square	.945	1.884	1.919	.033	.071	.060	.050	.027	1.190	1.102	3.060	.203	0.3	45.00
Degrees of Freedom														
Probability														

TABLE 25. (Contd.)

Age Group	Duration of Marriage (Years)													Not Given	Total	
	33	34	35	36	37	38	39	40	41	42	43	44	45			
16-20. No. of Women	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	192
Observed Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	212
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-25. No. of Women	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	465
Observed Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	612
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-30. No. of Women	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	369
Observed Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	449
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-35. No. of Women	1	—	—	—	—	—	—	—	—	—	—	—	—	—	3	252
Observed Births	2	—	—	—	—	—	—	—	—	—	—	—	—	—	1	242
Expected Births	1.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
36-40. No. of Women	4	3	4	1	—	—	—	—	—	—	—	—	—	—	—	198
Observed Births	2	2	6	1	—	—	—	—	—	—	—	—	—	—	—	115
Expected Births	2.3	1.7	2.3	0.58	—	—	—	—	—	—	—	—	—	—	—	—
41-45. No. of Women	19	8	20	5	4	5	2	2	—	—	—	—	—	—	—	108
Observed Births	3	2	1	—	4	3	1	1	—	—	—	—	—	—	—	23
Expected Births	4.0	1.7	4.2	1.1	0.84	1.1	0.42	0.42	—	—	—	—	—	—	—	—
46-50. No. of Women	2	9	7	10	5	5	12	12	4	—	1	2	2	—	—	75
Observed Births	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	3
Expected Births	0.08	0.36	0.28	0.40	0.20	0.20	0.48	0.48	0.16	—	0.04	0.08	0.08	—	—	—
Total No. of Women	26	20	31	16	9	10	14	14	4	—	1	2	2	4	—	1,659
Total Observed Births	7	4	7	1	4	3	2	2	—	—	—	—	—	2	—	1,656
Total Expected Births	7.38	3.76	6.78	2.08	1.04	1.30	0.90	0.90	0.16	—	0.04	0.08	0.08	4.20	—	1,655.42
Chi-Square	0.0	20.00	.071	—	—	—	—	0.9	62.00	—	—	—	—	—	—	22.311
Degrees of Freedom	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	29
Probability	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.80-.90

(d) **Age at Marriage:** The age at marriage of a woman indicates the starting point of her active fertile life. The effect of the age at marriage on fertility can be of two types. It might affect the specific fertility rates, or the total fertility. The latter aspect has received much attention in India. An earlier or later marriage lengthens or shortens the active fertile period of a woman. It was observed in the fertility inquiry at the 1931 Census that the average number of children born to women married later than 20 years of age was larger than that of those married at earlier years.⁹ Our data have no direct bearing on this issue. They throw light only on the effect of the age at marriage on specific fertility rates. In Table 26 the eligible women in our sample are distributed according to their age at marriage and the "observed" and "expected" number of births occurring to them are given.

The value of the Chi-square indicates that the age at marriage does not affect fertility rates in any significant manner. In other words, if there are two women of the same age, but married at different ages, their fertility rates are not likely to differ.

The conclusion has an indirect bearing on the phenomenon referred to above, i.e., the total number of children born to women married at different ages. If specific fertility rates are not affected by the age at marriage, the total fertility of two groups of women married at different ages may differ because of the different age compositions of the two groups. If in the fertility inquiry at the 1931 Census, it was found that women married after 20 years of age had on an average a larger number of children than those who were married at earlier ages, this was probably due, it may be suggested, to the different age compositions of the two cohorts of women covered by that inquiry, i.e., the cohort of women married at ages above 20 years, may have had an age composition favourable to higher fertility than that of the other cohort. It is not possible to verify this suggested explanation as the Census Report does not furnish figures regarding the age composition of these two cohorts of women separately.

(e) **Caste:** Caste is a factor of immense sociological significance in India and its effect on fertility has attracted at-

⁹ "Census of India," Vol. I, p. 206.

TABLE 26. THE DISTRIBUTION OF ELIGIBLE WOMEN IN THE SAMPLE IN EACH AGE GROUP ACCORDING TO THEIR AGE AT MARRIAGE AND THE OBSERVED AND THE EXPECTED BIRTHS OCCURRING TO THEM

Age Group	Age at Marriage in Years													No. of Given	Total		
	-12	13	14	15	16	17	18	19	20	21	22	23	24			25	
16-20. No. of Women	79	55	40	18	—	—	—	—	—	—	—	—	—	—	—	—	192
Observed Births	80	62	48	22	—	—	—	—	—	—	—	—	—	—	—	—	212
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-25. No. of Women	158	70	78	72	32	17	23	9	6	—	—	—	—	—	—	—	465
Observed Births	211	81	96	101	53	27	27	8	8	—	—	—	—	—	—	—	612
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-30. No. of Women	161	65	38	43	24	10	11	6	7	—	—	—	—	—	—	—	369
Observed Births	205	75	48	57	30	7	9	6	9	—	—	—	—	—	—	—	449
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-35. No. of Women	153	22	23	23	12	4	3	1	5	—	—	—	—	—	—	—	252
Observed Births	153	15	26	21	11	2	2	1	6	—	—	—	—	—	—	—	242
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
36-40. No. of Women	121	22	23	14	8	3	3	1	2	—	—	—	—	—	—	—	198
Observed Births	80	8	9	5	9	4	—	—	—	—	—	—	—	—	—	—	115
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
41-45. No. of Women	75	8	8	5	6	—	—	—	—	—	—	—	—	—	—	—	108
Observed Births	18	—	1	1	2	—	—	—	—	—	—	—	—	—	—	—	23
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
46-50. No. of Women	48	4	10	6	4	1	—	—	—	—	—	—	—	—	—	—	75
Observed Births	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Expected Births	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total No. of Women	795	246	220	181	86	35	44	18	23	—	2	1	1	3	4	—	1,659
Observed Births	749	241	228	207	105	40	39	15	24	—	—	2	1	3	2	—	1,656
Expected Births	726	268	231	198	89	40	49	21	23	—	2	1	1	3	4	—	1,656
Chi-Square	0.72	2.72	0.04	0.41	2.88	—	2.04	1.71	0.04	—	0.14					—	9.70
Degrees of Freedom																	8
Probability																	0.20-0.30

tention. In Cochin, Dr. Rama Varma's investigations showed that the total fertility of different castes differed significantly. It is not, however, possible to test whether the differences in fertility between castes disclosed by this investigation are really significant in the statistical sense, because of the absence of detailed figures regarding the ages and number of women of different castes. For studying the influence of castes on fertility in our sample, Table 27 has been prepared.

TABLE 27. THE DISTRIBUTION OF ELIGIBLE WOMEN IN THE SAMPLE IN EACH AGE GROUP ACCORDING TO CASTES, AND THE OBSERVED AND THE EXPECTED NUMBER OF BIRTHS OCCURRING TO THEM

Age Group	Caste							Total
	Marathas	Brahmins	Jains	Marathas Miscel- laneous	Harijans	Muslims	Others	
16-20. No. of Women	103	15	9	17	10	23	15	192
Observed Births	117	12	10	19	13	25	16	212
21-25. No. of Women	247	53	24	37	22	46	36	465
Observed Births	337	68	33	44	34	54	42	612
26-30. No. of Women	171	67	22	23	35	29	22	369
Observed Births	218	77	23	20	38	43	30	449
31-35. No. of Women	128	36	7	26	11	26	18	252
Observed Births	124	32	2	30	9	26	19	242
36-40. No. of Women	82	44	9	24	11	18	10	198
Observed Births	50	21	5	20	6	7	6	115
41-45. No. of Women	60	12	4	9	3	12	8	108
Observed Births	10	3	0	3	2	2	3	23
46-50. No. of Women	43	18	—	4	1	1	8	75
Observed Births	1	—	—	0	1	0	1	3
Total No. of Women	834	245	75	140	93	155	117	1,659
Observed Births	857	213	73	136	103	157	117	1,656
Expected Births	833	231	80	137	100	159	116	1,656
Chi-Square	0.69	1.40	0.63	0.01	0.09	0.03	0.01	2.86
Degrees of Freedom								6
Probability								0.80-0.90

Again the value of Chi-square indicates that the caste factor is not significantly correlated to fertility rates. This means that fertility rates of two women will not differ merely because they belong to different castes. Biologically speaking the fertility of different castes does not show any marked or significant differences.

(f) **Income:** From very ancient times it has been remarked that the rich have fewer children while the poor have more. Economic circumstance has also been observed as a

factor significantly affecting fertility in several fertility inquiries in the West as well as in India.¹⁰ In Table 28 the women in our sample are distributed according to the total income of their family and the number of "observed" and "expected" children is shown. Naturally women coming from the same family fall in identical income categories.

The value of the Chi-square again shows that income does not affect fertility rates in any significant manner.

(g) **Occupation of the Father:** Fertility is also known to vary among different occupational classes. Table 29 shows the distribution of eligible women in the sample according to the occupation of their husbands and the number of "observed" and "expected" births occurring to them. The scheme of occupational classification is the same as that adopted for Poona and Sholapur Surveys. It is also being followed in this survey.

The following are the occupational grades as per this classification:

- Grade I: Unskilled Manual Work (domestic workers, sweepers, bidi workers, etc.)
- Grade II: Skilled Manual Work (gardeners, weavers, carpenters, masons, washermen, barbers, cooks, etc.)
- Grade III: Lowest Professions and Administrative Posts (primary teachers, nurses, astrologers, priests, peons, etc.)
- Grade IV: Small Businesses (hawkers, small shops, small businesses, etc.)
- Grade V: Highly Skilled and Supervisory Manual Work (fitters, motor repairers, goldsmiths, tailors, compositors, jobbers, etc.)
- Grade VI: Clerks and Shop Assistants.
- Grade VII: Intermediate Professions and Salaried Posts (Civil and mechanical engineers, overseers, secondary teachers, administrative posts such as sub-inspectors, sub-registrars, etc.)
- Grade VIII: Medium Businesses (grain and grocery shops, prepared food and drink shops, agency business, repair shops, etc.)

¹⁰ Cf. Rama Varma, *op. cit.*

TABLE 28. THE DISTRIBUTION OF ELIGIBLE WOMEN IN THE SAMPLE IN EACH AGE GROUP ACCORDING TO THEIR ANNUAL FAMILY INCOME AND THE NUMBER OF OBSERVED AND EXPECTED BIRTHS OCCURRING TO THEM

Age Group	Annual Income of the Family in Rupees													Not Given	Total	
	<50	51-75	76-100	101-150	151-200	201-300	301-400	401-500	501-750	751-1,000	1,001-1,500	1,501-2,000	2,001-5,000			Above 5,000
16-20. No. of Women	1	1	—	2	1	28	28	21	43	26	17	10	4	1	9	192
Observed Births	1	0	—	3	1	23	40	19	53	38	12	10	5	—	7	212
21-25. No. of Women	5	1	—	4	8	59	55	62	101	49	43	19	28	6	25	465
Observed Births	7	0	—	6	14	62	71	74	121	75	61	28	40	9	44	612
26-30. No. of Women	—	—	2	2	10	36	55	56	79	32	39	13	19	4	22	369
Observed Births	—	—	3	2	8	45	65	57	105	40	42	18	27	2	35	449
31-35. No. of Women	—	—	1	5	8	21	26	36	55	29	25	14	15	2	15	252
Observed Births	—	—	0	3	10	22	15	29	62	22	30	10	20	1	18	242
36-40. No. of Women	1	3	2	3	6	20	16	25	36	27	22	10	18	2	7	198
Observed Births	1	2	0	0	4	18	9	12	20	17	14	3	11	0	4	115
41-45. No. of Women	—	1	—	4	4	8	13	10	23	13	12	6	8	1	5	108
Observed Births	—	0	—	1	0	1	2	2	4	5	4	0	3	0	1	23
46-50. No. of Women	—	—	3	2	—	7	3	6	17	8	11	4	5	2	7	75
Observed Births	—	—	0	0	—	1	0	0	1	0	1	0	0	0	0	3
Total No. of Women	7	6	8	22	37	179	196	216	354	184	169	76	97	18	90	1,659
Observed Births	9	2	3	15	37	172	202	193	366	197	164	69	106	12	119	1,656
Expected Births	8.3	4.4	5.2	17.4	35.8	186.1	207.4	224.4	355.8	178.8	162.6	72.5	91.1	17.2	89.4	1,656.4
Chi-Square	0.06	1.10	0.93	0.33	0.04	1.07	0.14	4.39	0.29	2.00	0.01	0.17	2.44	1.57	9.80	14.54
Degrees of Freedom																13
Probability																0.30-0.50

Grade IX: Highest Professions and Salaried Posts (administrative officers, liberal professions—professors, doctors, lawyers, etc.)

Grade X: Owners of factories, large shops, etc.

These grades are arranged in an ascending order of social and economic importance. They broadly fall into three broad economic groups. Grades I, III and V—skilled and unskilled wage-earners (manual labour): Grades IV, VIII and X—business (enterprise); Grade III, VI, VII and IX—professions and administrative work (services and salariat). The grades are not thus purely "skill" or purely "status" grades, but rather "skill-status" grades. Grades XI, XII, XIII are in a class by themselves. Grade XI contains Pensioners, Grade XII Beggars and Grade XIII Unemployed Persons. All unclassified persons are put into Grade XIV.

The value of the Chi-square in this case also shows that there is no correlation between occupation and fertility rates.

(h) **Occupation of the Mother:** It has been observed that the occupation of the woman, if she is an earner, influences fertility.¹¹ In Table 30 such women, i.e., earners, among the eligible women in the sample, are distributed according to whether they did manual or non-manual work and the number of "observed" and "expected" births occurring to them.

Again the absence of any significant correlation between the profession of the woman and her fertility is shown by the value of Chi-square.

The analysis made so far shows that, except for the age of the mother and the father, the other factors did not affect fertility rates in any significant manner. Broadly it indicates the absence of differential fertility among castes, income groups, professions, etc. This should occasion no surprise. Dr. Pearl observed after examining a large mass of data that "if it were not for the effect of contraceptive efforts and the practice of criminal abortion, together with correlated habits as to postponement of marriage, there would apparently be little or no significant differential fertility as between eco-

¹¹ Rama Varma, *op. cit.*

TABLE 29. THE DISTRIBUTION OF ELIGIBLE WOMEN IN THE SAMPLE IN EACH AGE GROUP
 ACCORDING TO THE OCCUPATION OF THE HEADS OF THEIR FAMILIES AND THE NUMBER
 OF OBSERVED AND EXPECTED BIRTHS OCCURRING TO THEM

Age Group	Occupational Grade of the Head of the Family														Total
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	
16-20. No. of Women	17	35	21	20	26	25	10	28	4	—	—	1	3	2	192
Observed Births	17	36	28	15	29	37	17	25	2	—	—	0	4	2	212
21-25. No. of Women	49	77	45	31	56	70	29	76	13	—	3	—	12	4	465
Observed Births	50	86	57	37	88	95	45	106	22	—	3	—	17	6	612
26-30. No. of Women	36	60	41	30	40	53	27	49	13	1	4	—	11	4	369
Observed Births	43	82	42	35	45	58	38	67	17	—	8	—	8	6	449
31-35. No. of Women	21	49	20	21	32	32	18	35	7	1	8	—	3	3	252
Observed Births	15	53	15	20	33	33	23	29	7	—	9	—	5	2	242
36-40. No. of Women	18	36	11	20	11	21	12	32	15	2	4	1	12	3	198
Observed Births	6	25	9	10	7	11	4	20	12	—	1	—	8	2	115
41-45. No. of Women	4	18	8	12	6	9	2	22	2	1	16	—	8	—	108
Observed Births	2	5	—	5	1	2	1	3	—	—	4	—	—	—	23
46-50. No. of Women	3	11	5	7	2	6	2	10	3	1	21	—	4	—	75
Observed Births	—	2	—	—	—	—	—	—	—	—	1	—	—	—	3
Total No. of Women	148	286	151	141	173	216	100	252	57	6	56	2	53	18	1,659
Observed Births	133	289	151	122	203	236	128	250	60	0	26	0	40	18	1,656
Expected Births	158.7	285.2	159.8	134.0	189.6	229.3	106.8	247.8	33.3	3.8	23.1	1.7	44.2	18.9	1,656.2
Chi-Square	4.16	0.05	0.48	1.07	0.95	0.19	4.21	0.02	0.84	3.80	0.56	1.70	0.40	0.05	18.28
Degrees of Freedom															13
Probability															0.10-0.20

TABLE 30. THE DISTRIBUTION OF ELIGIBLE WOMEN IN THE SAMPLE IN EACH AGE GROUP ACCORDING TO THEIR OCCUPATION AND THE OBSERVED AND THE EXPECTED NUMBER OF BIRTHS OCCURRING TO THEM

Age Group	Occupation					Total
	Manual	Non-Manual	Business	Other	Nil	
16-20. No. of Women	12	1	1	—	178	192
Observed Births	14	1	1	—	196	212
21-25. No. of Women	30	3	3	—	429	465
Observed Births	27	5	2	—	578	612
26-30. No. of Women	25	2	5	—	337	369
Observed Births	31	—	1	—	417	449
31-35. No. of Women	19	4	5	—	224	252
Observed Births	15	6	5	—	216	242
36-40. No. of Women	11	2	5	—	180	198
Observed Births	4	—	5	—	106	115
41-45. No. of Women	7	2	3	—	96	108
Observed Births	4	—	—	—	19	23
46-50. No. of Women	5	1	1	—	68	75
Observed Births	1	—	—	—	2	3
Total No. of Women	109	15	23	—	1,512	1,659
Observed Births	96	12	14	—	1,534	1,656
Expected Births	109	15	19	—	1,513	1,656
Chi-Square	1.55	0.60	1.32	—	0.29	3.76
Degrees of Freedom						3
Probability						0.20-0.30

nomie, educational or religious classes of urban American married couples."¹² In Kolhapur, where the various economic, social, etc. classes did not significantly differ as regards marriage habits, practice of contraception, etc., the absence of differential fertility would be only natural.

10. **Sex of Children Born.**—Of the total births recorded in our survey during 1941-45, 48 per cent were female births. The question as to what factors determine the sex of a child has attracted considerable attention in India and a major part of the fertility data gathered at the 1931 Census as well as the 1941 Census were gathered with that aim. In the following we have tried to gauge the influence of three factors that are supposed to affect the sex of the child. These are (a) caste, (b) age, (c) order of delivery. The relevant data are set out in Table 31. The influence of these three

¹² "The Natural History of Population," Raymond Pearl, 1939, p. 244.

factors on masculinity was tested for statistical significance. This showed that the variations of the sex-ratio among the children born was not correlated with any of these three factors in any significant manner.

TABLE 31. THE NUMBER OF MALE BIRTHS TO 1,000 FEMALE BIRTHS IN DIFFERENT AGE GROUPS, CASTES AND ACCORDING TO RANK OF DELIVERY

Caste	Proportion of Male Births to 1,000 Female Births	Age of Mother	Proportion of Male Births to 1,000 Female Births	Rank of Delivery	Proportion of Male Births to 1,000 Female Births	Rank of Delivery	Proportion of Male Births to 1,000 Female Births
Marathas	1,022	16-20	842	I	1,190	VII	888
Brahmins	1,098	21-25	1,180	II	1,026	VIII	1,000
Jains	1,000	26-30	1,009	III	934		
Harijans	745	31-35	1,161	IV	941		
Muslims	1,365	36-40	1,196	V	894		
Others	1,214	41-45	1,273	VI	923		

11. **The Age at Marriage.**—The fertility schedule sought and obtained information regarding the age at marriage of all married and widowed women in the sample. As the sample consisted of women between 13-50 years of age, this information could be used to throw light on the changes that might have taken place in the age at marriage between 1896 and 1933, a period of 37 years. Of the total 2,825 women covered by our inquiry, 328 were unmarried in 1945. Of the remaining, omitting the small group of prostitutes, concubines, etc., and a few others in whose case the age at marriage was not reported, we have information regarding the age at marriage in regard to 2,396 women. (In the few cases of re-married widows, ages at their first marriages are considered.) Table 32 gives the average age at marriage in each age group and caste.

Considering all women together irrespective of their age, the average age at marriage is found to be nearly 13 years or 12.89 years to be exact. It can be observed that among the Brahmins the age at marriage was the highest. Jains came very near to Brahmins in this respect. Harijans had the lowest average age at marriage. Among the Marathas it was only slightly higher.

TABLE 32. AVERAGE AGE AT MARRIAGE OF WOMEN IN THE SAMPLE BY AGE GROUPS AND CASTES

Age Group	Caste							Total
	Marathas	Brahmins	Jains	Harijans	Marathas Miscellaneous	Muslims	Others	
11-15	13.06	12.00	—	12.11	13.22	13.14	13.50	12.99
16-20	13.98	15.34	14.69	13.71	13.66	13.81	14.03	14.12
21-25	13.59	16.20	14.17	13.23	13.23	13.32	14.05	13.93
26-30	12.52	15.17	14.42	12.03	12.74	14.06	12.62	13.21
31-35	11.32	14.09	13.30	10.47	11.52	13.56	12.57	12.07
36-40	11.15	13.36	13.14	10.83	10.93	12.50	11.74	11.79
41-45	11.09	11.88	11.00	9.86	10.74	12.29	12.43	11.33
46-50	10.46	12.06	11.33	10.25	9.40	10.25	12.71	10.94
Total	12.46	14.40	13.83	11.97	12.20	13.27	13.19	12.89

By the same method we might now study the movement of the age at marriage through time, i.e., between 1896 and 1933. The figures clearly bring out the fact that there has been a very definite, though rather small, shift in the age at marriage over the period, though there is a slight recession toward the end of it. An analysis of variance showed that these movements in the age at marriage were statistically significant. The latter seems to be common to all castes and is particularly marked among Brahmins. It appears that this trend began, in the case of Brahmins, some time between 1925-30. It was not to be observed then among the other castes. It is not possible to adduce any satisfactory explanation as to the cause or causes of this phenomenon. There is no reason why the correctness of the information regarding recent years should have been less than that regarding the earlier period. Generally it would appear that from the beginning of this century till about 1930 the age at marriage among all communities, except the Brahmins as noted earlier, recorded a small but progressive rise. The magnitude of the increase was also roughly the same, about 3 years, among the different castes.

12. **Births and the Rank of Delivery.**—The questionnaire for the fertility inquiry also furnished for every birth recorded, the rank of delivery. The information gathered on this point is both interesting and instructive and is summarised here. For this purpose, in the case of women reporting more

than one delivery during the period, only the first of the reported deliveries is taken into account.

Of the total such deliveries recorded during 1941-45, 12.1 per cent were first deliveries, 20 per cent second deliveries, 19.3 per cent third deliveries, 18 per cent fourth deliveries, 10.8 per cent fifth deliveries, 7.4 per cent sixth deliveries and about 4.1 per cent seventh deliveries.

More than half of the first deliveries were concentrated in the age group 21-25 and 37 per cent occurred in the age group 16-20. Nearly 57 per cent of second deliveries were again concentrated in the age group 21-25, while 21 per cent were found in the age group 16-20 and 16 per cent in the age group 26-30. About 44 per cent of the third deliveries occurred to women in the age group 21-25 and about 32 per cent to those in the age group 26-30. Nearly 43 per cent of the fourth deliveries were lumped in the age group 26-30, a further 29 per cent and 18 per cent of them occurring in age groups 21-25 and 31-35 respectively. In the age group 26-30, occurred 42 per cent of the total fifth deliveries, 25 per cent occurring in the age group 31-35 and 17 per cent in the age group 21-25. In the age groups 26-30 and 31-35 were reported 40 per cent and 29 per cent respectively of the total sixth deliveries.

In the age group 16-20, 38.4 per cent of the total deliveries reported were first deliveries and 37 per cent second ones, 13 per cent third ones and 9 per cent fourth deliveries. In the age group 21-25, 16 per cent were first deliveries, 32 per cent second ones, 26 per cent were third ones and 17 per cent fourth deliveries. Third and fourth deliveries were 19 and 26 per cent respectively in the total deliveries occurring in the age group 26-30. A further 17 per cent were fifth deliveries. Fourth and fifth deliveries were about 20 per cent and 17 per cent respectively in the age group 31-35 and about 16 per cent were sixth and 10 per cent seventh deliveries. In the age group 36-40, 18 per cent were fifth deliveries, 14 per cent sixth ones, while 10 per cent each were third, fourth and eighth deliveries. In the age group 41-45, third and sixth deliveries were 21 per cent each, and fifth and eighth deliveries 10 per cent each. A case each of eighteenth and nineteenth deliveries was reported and both of them were in the age group 36-40.

13. **Rank of Delivery and Fertility.**—The number of previous deliveries of a woman under investigation might affect her fertility and fertility might tend to decline with each successive delivery.¹³ This can be tested by classifying women in each age group according to the number of their previous deliveries, i.e., number of deliveries prior to the period under investigation. If the number of previous deliveries to a woman does affect her future fertility, age specific fertility rates, made further specific for the order of delivery, should be expected to differ significantly. But we could not follow this method of analysis because of a deficiency in our data. In our inquiry, information regarding the order of delivery of every birth recorded was collected, but no information about the total number of deliveries that had occurred to women who reported no delivery during 1941-45 was recorded. Yet some light may be thrown on the point by attacking the problem from a different angle.

If we classify the women in the sample according to the number of births occurring to each during the period of investigation, we find that 483 women reported only one delivery each during the period, 422 reporting two and 95 reporting three deliveries. In the case of all these 1,000 women the number of deliveries that had occurred to them previous to the period of investigation, could be calculated from the reported order of their first delivery during the period of investigation. This calculation shows that 2,176 deliveries had occurred to these 1,000 women prior to 1941-45. The average number of prior deliveries to women in the various age groups can also be calculated. They are given on the next page.

If the 483 women reporting only one birth during the period of investigation are distributed into age groups and the total number of prior deliveries to them is calculated by the aid of the averages given above, we can find what may be called the "expected" number of prior deliveries to these women. The calculation shows that 1,110 prior deliveries may be expected to have occurred to these women. In this

¹³ P. K. Welpton has suggested recently that in order to improve the accuracy of reproduction rates for any year, it is necessary to adjust the order of birth of child and parity of women, the latter measuring the number of children already born. The age-parity specific birth rates give proper weight to the fertility in prior years of each age cohort in the actual population. "Reproduction Rates Adjusted for Age, Parity, Fecundity and Marriage," *Journal of the American Statistical Association*, December 1946.

✓ 25. 221111

Age Group	Average Number of Prior Deliveries Per Woman
16-20	0.22
21-25	1.04
26-30	2.63
31-35	3.88
36-40	5.24
41-45	5.55

calculation, it should be remembered that the averages derived from the prior deliveries of all the 1,000 women have been applied to 483 women with one delivery only during the period of investigation. The expected number of prior deliveries thus calculated presumes that the number of prior deliveries does not affect future fertility. In fact, however, the 483 women were reported to have had 1,175 deliveries prior to the period of investigation, a number greatly in excess of the expected 1,110.

The results of this and similar calculations in respect of women reporting 2 and 3 births each during the period of investigation are presented below.

Number of Births during the Period (1941-45)	Number of Women	Expected Number of Prior Deliveries	Reported Number of Prior Deliveries
1	483	1,110	1,175
2	422	872	815
3	95	194	186
Total	1,000	2,176	2,176

It will be seen that, in contrast to women reporting one birth during the period of investigation, in the case of women reporting two and three births each, the actual number of prior deliveries reported was less than that expected. To put the results in another manner, women with relatively more prior deliveries reported relatively fewer births during the period of investigation and vice versa. The above analysis clearly indicates that the number of children already born, at any rate above a certain minimum, tends to diminish future fertility.

14. Still Births, Untimely Deliveries, and Multiple Births.—Table 33 gives the still births, untimely deliveries

and multiple births occurring to the eligible women in the sample during 1941-45.

TABLE 33. STILL BIRTHS, MULTIPLE BIRTHS AND UNTIMELY DELIVERIES OCCURRING TO ELIGIBLE WOMEN IN EACH AGE GROUP IN THE SAMPLE DURING 1941-45

Age Group	Still Births	Untimely Deliveries	Twins
16-20	11	2	—
21-25	17	3	2
26-30	13	3	1
31-35	14	4	4
36-40	5	4	1
41-45	1	—	2
Total	61	16	10

APPENDIX I
INSTRUCTIONS TO INVESTIGATORS FOR FILLING
HOUSE SAMPLE QUESTIONNAIRES

General: A list of house numbers to be covered during the inquiry will be supplied to the investigator. Separate questionnaires should be filled in for each resident family in the selected house. Investigators should immediately report cases of refusal to give information, a single house bearing more than one municipal number, etc.

Use one questionnaire for one family only. Information regarding every individual in a family must be entered in the questionnaire. Guests, temporarily staying with the family, should not be taken into consideration. Persons not related to the family and yet permanently staying with it should be treated as members of the family. Persons paying for their boarding and lodging with the family should be also classified as above and the fact should be noted in column 1 (p. 2) "relation."

In case many persons are living together in one tenement and are jointly paying rent, the name of the person in whose name the lease stands should be entered against "name" (p. 1), and all others should be entered as "common tenants" in column 1 (p. 2), "relation."

Name: The name should be that of the head of the family (male or female).

Caste and Sub-caste: Under this heading details of sub-castes should be given. In the case of non-Hindus, other sectional differences, if any, such as Catholic, Bohra, Pathan, etc., should be noted.

Earners: Persons continuously following some gainful occupation should be entered under this head. Persons not earning, for the time being, because of illness or a temporary lack of employment, etc., should also be treated as "earners."

Relation: Under this heading should be entered the relation of the person concerned to the head of the family.

Education (A) Earners: In the case of persons who have received some school education the standard up to

APPENDIX I. QUESTIONNAIRES USED IN THE HOUSE SAMPLE AND FERTILITY INQUIRIES

(22)	Living Accommodation (a) Total No. of Persons: (b) No. of Living Rooms: (c) Total Living Area (Khans): (d) No. of Taps and No. of Families Using Them: (e) No. of Latrines and No. of Families Using Them:	25. Are There Any Infirm in the Family, Such as Following:														
		Type	Relation	Age	Whether Infirm From Birth					Cause of Infirmary						
		1. Blind														
		2. Deaf														
		3. Mute														
		4. Insane or Invalid														
		5. Others														
(23)	Block Owned or Rented? Monthly Rent Description of Living Area:															
(24)	Domestic Servants						26. Outside Members									
	Sex	Type of Work	Working Hours	Monthly Salary	Lodging Arrangements	Boarding Arrangements	(a) Relation	1	2	3	4	5	6	7	8	9
							(b) Age									
							(c) Sex and Marital Status									
							(d) Education									
							(e) Earner or Non-Earner									
							(f) Residence Outside Kolhapur Temporary or Permanent									
							(g) Period of Residence Outside Kolhapur									
							(h) Occupation									
							Remarks:									

INSTRUCTIONS TO INVESTIGATORS

A list of house numbers to be covered by each investigator will be supplied to her. Investigators should immediately report to the Chief Investigator cases of refusal to give information, uninhabited houses, etc., so that substitute house numbers can be given to them. Use a separate questionnaire for each family.

Occupation: In recording the information regarding the occupation of the head of the family and the husband (Column 9) give details such as: carpenter in a furniture workshop, brass-and-copper smithy, clerk in the Agricultural Department, clerk, salesman or hamal in a retail or wholesale shop, etc.

Column 1: All women between 13 and 50 years of age in the family must be entered in this column. Do not write names; only enter the relation of each to the head of the family, such as wife, daughter, sister, daughter-in-law, sister-in-law, etc.

Column 5: This column is to be filled in only in the case of widowed or re-married women. In the case of divorced women enter the age at the time of divorce.

Column 8: To be filled up only in the case of married or re-married women.

Column 12-16: In these columns are to be recorded the deliveries, whether complete or incomplete, occurring to women between 13-50 years of age, during 1941-45. Record still and multiple births as also the rank of delivery in each case. In the case of completed deliveries, note the sex of the child and its age at the time of the inquiry; if the child is not living at that time, note the fact and also its age at the time of death, such as "son, dead, 8 months," etc. In the case of twins, etc., note carefully the sex of each child.

APPENDIX II

Statistical Notes

By V. M. Dandekar, Statistician, Gokhale Institute of
Politics and Economics

Note 1: Derivation of Specific Fertility Rates

In the following is given the fertility record as obtained year by year for the 1,659 eligible women grouped in quinquennial age groups.

Age Group	No. of Eligible Women	Total Number of Births in				
		1941	1942	1943	1944	1945
16-20	192	26	30	55	38	63
21-25	465	112	109	110	134	147
26-30	369	84	89	112	67	97
31-35	252	63	47	45	41	46
36-40	198	26	22	31	11	25
41-45	108	7	5	7	2	2
46-50	75	—	1	—	1	1
Total	1,659	318	303	360	294	381

The difference between the total number of births in different years is rather striking, especially so between the years 1943 and 1945 on the one hand and 1944 on the other. This difference, unless satisfactorily explained, would be an indication of defective birth reporting. The reports were obtained in a single visit at the end of 1945, and the general impression that the above table conveys is that at least a few births which really occurred in 1944 were reported as occurring in 1945. This appears very plausible in view of the fact that no attempt was made to obtain the dates or even roughly the months in which the births occurred. On the other hand, the year 1943 does not seem to suffer from any such effects of foreshortening and, if anything, actually seems to have gained a little as if from a reporting of a few births of 1942 as in 1943. This is certainly a somewhat intriguing picture. Finally, it appears not unlikely that all births that occurred in 1941 and 1942 might not have been reported. This could happen through the omission of some of those births whose issues were not living in 1945.

Such are the possible defects in the birth reporting. Before we pass judgment on such a possibility, we may inquire as to whether there are any other causes which may create fluctuations in the annual fertility performance such as observed.

The first important fact causing differences between individual years is that the 1,659 women do not remain of the same ages throughout the whole five-year period. For instance, all the women are one year younger in 1944 than in 1945. Five years is a fairly long period to cause important differences in specific fertility of the majority of the 1,659 women. This factor alone, therefore, should cause some differences between the years.

In order to remove the effect of this factor, we first find out the average number of deliveries per 1,000 women of each age group, for each of the five years.

Age Group	Births Per 1,000 Married Women In				
	1941	1942	1943	1944	1945
16-20	135	154	286	198	328
21-25	241	234	236	288	316
26-30	228	242	304	182	263
31-35	250	186	179	163	182
36-40	131	111	156	55	126
41-45	65	46	65	19	10
46-50	—	13	—	13	13

It is now possible to make due allowance for the fact that the women do not remain of the same ages for all the five years. The women in the age group 16-20 are seen to have 328 deliveries per 1,000 of them, in 1945. Their mid-age in 1945 is 18, so that the rate is attributable to this age. In 1944 they were all younger by one year, so that their mid-age then was 17, and the rate 198 per 1,000 is attributable to that age. In this way, from the deliveries occurring to women of age group 16-20, we may derive specific fertility rates for ages 14, 15, 16, 17 and 18 from the record of years 1941, 1942, 1943, 1944 and 1945 respectively. Thus proceeding, we may derive fertility rates for all individual ages from 14 to 48. These are given below.

If the factor under consideration, namely, change in age during the five year period was really an important

Age	Births Per 1,000 Married Women	Derived From the Year	Age	Births Per 1,000 Married Women	Derived From the Year
14	135	1941	31	179	1943
15	154	1942	32	163	1944
16	286	1943	33	182	1945
17	198	1944	34	131	1941
18	328	1945	35	111	1942
19	241	1941	36	156	1943
20	234	1942	37	55	1944
21	236	1943	38	126	1945
22	288	1944	39	65	1941
23	316	1945	40	46	1942
24	228	1941	41	65	1943
25	242	1942	42	19	1944
26	304	1943	43	19	1945
27	182	1944	44	—	1941
28	263	1945	45	13	1942
29	250	1941	46	—	1943
30	186	1942	47	13	1944
			48	13	1945

cause of the differences observed between different years, we would expect the specific fertility rates to give us a smooth and gradually changing series. Instead there are very regular ups and downs of the type, for instance, that the rates derived from the record of 1944 are consistently lower than those derived from either the 1943 or the 1945 record.

There is, of course, one defect in the above derivation of specific fertility rates which would prevent them to some extent from being a smooth series. There are 192 women who were of ages from 16 to 20 in 1945; or, more accurately, there are so many women who reported themselves as of these ages in 1945. There is no doubt that all of them were one year younger in 1944. It is highly questionable, nevertheless, whether, if the inquiry were actually conducted in 1944 instead of in 1945, these same women would have reported themselves as one year younger than they actually did in 1945. In so far as this is so, the procedure adopted above attributes to the age returns an accuracy which is not their own.

There is yet another reason, rather of a technical character, which may cause the type of fluctuations between years as are observed. It is a physiological fact of human reproduction that a woman is not and cannot be exposed to the chance of becoming pregnant while she is already pregnant. Roughly this amounts to the fact that a woman cannot normally deliver more than once during the course of a single

year. This fact results in giving her a much smaller chance of delivering in any calendar year, such as 1945, if she has already delivered in the preceding year. So far as the performance, year after year, of a single woman is concerned, therefore, we are bound to find marked variations from year to year. This inherent variation in the performance of a single woman tends to persist even in the collective performance of a group of women unless the group is very large. Consider, for instance, a group of women of a certain age of whom we expect, on specific fertility conditions, that fifty should deliver this year and forty-eight next year. Suppose now that by chance it happens that not fifty but actually sixty deliver this year. This happens and is termed the chance deviation from expectation. Such chance effects become less and less prominent in the collective performance of a larger group, the reason being that the individual chance deviations tend to cancel one another. In smaller groups, however, such effects are usual and consequently expectations are seldom exactly realised. In such a case, therefore, when sixty instead of an expected fifty deliver this year, it is almost certain that next year not forty-eight but a considerably smaller number will deliver.

Technically we say that the random errors in two adjacent specific fertility rates, derived from the performance from year to year of the same group of women, are negatively correlated, so that if the derived rate at one age happens by chance to be an overestimate, the same in the subsequent year is most likely to be an underestimate. We may expect the series of specific fertility rates derived from such data to show on this account a zigzag appearance with alternate ups and downs.

This is just the kind of variation that is observed from year to year. Thus specific fertility rates at 18, 23, 28, 33, 38, 43 and 48 which are derived from the record in 1945 appear to be overestimates, and those for 17, 22, 27, 32, 37, 42 and 47 derived from the birth record in 1944 are underestimates, and further again those for 16, 21, 26, 31, 36, 41 and 46 derived from the birth record in 1943 are overestimates. There is, however, one disturbing feature, namely, that all estimates of specific fertility rates at the several ages derived from the birth record of 1945 are over-

Age	Births Per 1,000 Married Women	Derived From the Year	Age	Births Per 1,000 Married Women	Derived From the Year
14	135	1941	31	179	1943
15	154	1942	32	163	1944
16	286	1943	33	182	1945
17	198	1944	34	131	1941
18	328	1945	35	111	1942
19	241	1941	36	156	1943
20	234	1942	37	55	1944
21	236	1943	38	126	1945
22	288	1944	39	65	1941
23	316	1945	40	46	1942
24	228	1941	41	65	1943
25	242	1942	42	19	1944
26	304	1943	43	19	1945
27	182	1944	44	—	1941
28	263	1945	45	13	1942
29	250	1941	46	—	1945
30	186	1942	47	13	1944
			48	13	1945

cause of the differences observed between different years, we would expect the specific fertility rates to give us a smooth and gradually changing series. Instead there are very regular ups and downs of the type, for instance, that the rates derived from the record of 1944 are consistently lower than those derived from either the 1943 or the 1945 record.

There is, of course, one defect in the above derivation of specific fertility rates which would prevent them to some extent from being a smooth series. There are 192 women who were of ages from 16 to 20 in 1945; or, more accurately, there are so many women who reported themselves as of these ages in 1945. There is no doubt that all of them were one year younger in 1944. It is highly questionable, nevertheless, whether, if the inquiry were actually conducted in 1944 instead of in 1945, these same women would have reported themselves as one year younger than they actually did in 1945. In so far as this is so, the procedure adopted above attributes to the age returns an accuracy which is not their own.

There is yet another reason, rather of a technical character, which may cause the type of fluctuations between years as are observed. It is a physiological fact of human reproduction that a woman is not and cannot be exposed to the chance of becoming pregnant while she is already pregnant. Roughly this amounts to the fact that a woman cannot normally deliver more than once during the course of a single

year. This fact results in giving her a much smaller chance of delivering in any calendar year, such as 1945, if she has already delivered in the preceding year. So far as the performance, year after year, of a single woman is concerned, therefore, we are bound to find marked variations from year to year. This inherent variation in the performance of a single woman tends to persist even in the collective performance of a group of women unless the group is very large. Consider, for instance, a group of women of a certain age of whom we expect, on specific fertility conditions, that fifty should deliver this year and forty-eight next year. Suppose now that by chance it happens that not fifty but actually sixty deliver this year. This happens and is termed the chance deviation from expectation. Such chance effects become less and less prominent in the collective performance of a larger group, the reason being that the individual chance deviations tend to cancel one another. In smaller groups, however, such effects are usual and consequently expectations are seldom exactly realised. In such a case, therefore, when sixty instead of an expected fifty deliver this year, it is almost certain that next year not forty-eight but a considerably smaller number will deliver.

Technically we say that the random errors in two adjacent specific fertility rates, derived from the performance from year to year of the same group of women, are negatively correlated, so that if the derived rate at one age happens by chance to be an overestimate, the same in the subsequent year is most likely to be an underestimate. We may expect the series of specific fertility rates derived from such data to show on this account a zigzag appearance with alternate ups and downs.

This is just the kind of variation that is observed from year to year. Thus specific fertility rates at 18, 23, 28, 33, 38, 43 and 48 which are derived from the record in 1945 appear to be overestimates, and those for 17, 22, 27, 32, 37, 42 and 47 derived from the birth record in 1944 are underestimates, and further again those for 16, 21, 26, 31, 36, 41 and 46 derived from the birth record in 1943 are overestimates. There is, however, one disturbing feature, namely, that all estimates of specific fertility rates at the several ages derived from the birth record of 1945 are over-

estimates. This is something which rarely happens due to chance alone. The conclusion, therefore, appears inevitable that at least a few births in 1944 have been reported as in 1945. The year 1943 also seems to have been affected by similar circumstances, though they are somewhat less satisfactorily understandable.

The fertility record separately for each year, therefore, appears to be not trustworthy, and we should be content to deal with it as a whole, that is, births recorded during the whole of the five year period as a whole. Undoubtedly the possibility still remains that some of the births actually occurring before the five-year period under investigation, might have been reported as occurring in the initial years of this period. Such results are nevertheless likely to be less serious, for, in the first instance, apparently it is the more recent years that seem to be more powerfully affected by effects such as foreshortening in reporting, and secondly, any such small effects as affect the earlier years are likely to be more or less offset by a possible omission of a few births in those years, due to the unfortunate circumstance that their issues were not living at the time of reporting. Moreover, when we consider the five year period as a whole, any such residual effects are averaged over five years, and hence affect the final fertility rates to a much less extent.

With a view to deriving the fertility rates from the record of the five-year period as a whole, we give below by quinquennial age groups, the number of women, total births occurring to them during the five years, and births to them per 1,000 married women per annum.

Age Group	Number of Eligible Women	Total Number of Births	Births Per 1,000 Per Annum
16-20	192	212	221
21-25	465	612	263
26-30	369	449	243
31-35	252	242	192
36-40	198	115	116
41-45	108	23	43
46-50	75	3	8

The only point that need be settled now is to which age year shall we attribute the specific fertility rate derived from the performance of the women, say, in age group 16-20. The ages were reported in 1945, so that the mid-age of this

group of women in 1945 is 18. The mid-year of the five-year period under investigation, on the other hand, is 1943, in which year the mid-age of the group would be 16. This, therefore, is the age to which the specific fertility rate should be attributed. Hence the fertility rates given above are attributable to ages 16, 21, 26, 31, 36, 41 and 46 respectively. From these are obtained the specific fertility rates for single age years by simple graduation. These are given in Table 18.

Note 2: Use of Chi-square to Test the Significance of Factors Other Than the Age of Mother.

After the effect of the primary factor, namely, the age of the mother on fertility, has been assessed, the appropriate method to evaluate the effect of other factors such as the age of the father, etc., would be to introduce the two factors simultaneously into the analysis of variance and test whether the introduction of the additional factor materially increases the portion of the variation explained. Due to the fact that factors not under experimental control are seldom orthogonal such analysis for each factor usually becomes too laborious. A shorter method has, therefore, been proposed. We shall discuss this method with reference to one of the factors discussed, namely, the age of the husband.

We first group the women according to the ages of their husbands. If the age of the husband is unimportant as a factor influencing the fertility of a woman these groups of women should on an average have the same number of births, except for the fact that the age composition of the several groups is different. In order to allow for this difference in age composition, the women in each group are distributed according to their own age, and from the age specific fertility rates already derived is found the number of births that might be expected of them. The difference between this expected number and the actual number of births to these women is ascribable, apart from chance effects, to the factor under consideration, namely, the age of the husband.

For a test of significance, the Chi-square test is available and tests whether or not the differences between the expected number of births and the actual births are wholly explainable as merely chance effects. The applicability of this test in this connection may be seen when it is noted that

here, in effect, we distribute the total number of births, according to the age of fathers, and then compare this distribution with another distribution, expected on the null hypothesis that the age of the husband is unimportant as a factor influencing the fertility of the wife.

Note 3: Derivation of the age specific fertility rates made further specific for the difference between the ages of husband and wife.

Having found that the age of the husband or the difference between the ages of the wife and the husband is an important factor influencing fertility, it becomes essential to make the usual age specific fertility rates further specific for this factor. This amounts to deriving the fertility rates specific for a particular combination of ages of the wife and husband. For this purpose it is necessary to distribute the women in a two-way table as is done in Table 22 or Table 23, and derive the fertility rates from the performance of the women falling in each sub-class of this table.

The number of women falling in each of the several sub-classes of the table is rather small, and in many cases too small, so that the fertility rates derived from them would be very much liable to error. We therefore presume a simpler situation, namely, that the effects of the two factors are additive, that is to say we presume, for instance, that the difference that it makes to the fertility of a woman according as the husband is of age 25 or 35 is the same whether the woman is aged 20 or 40. Such hypothesis is apparently far from the truth in the case of the above factors, but should be nearer to it if imposed on the two factors, age of woman and difference between her age and that of her husband. We therefore work out the fertility rates, specific for the age of women and the difference between their and their husband's ages on the hypothesis that the effect on the fertility of a woman of the difference between her age and her husband's age is uniform whatever her age. In other words, it means that there is a certain effect on fertility of the age of the woman and a certain other effect of the difference between her age and her husband's and that these two effects simply add to produce the joint effect. Such a hypothesis is, therefore, usually referred to as the additive hypothesis.

On this hypothesis it is only necessary to obtain estimates of the effects of the two factors, and add them together to obtain the requisite specific rates. The estimates of these effects are available from the performance of the total women in the marginal classes of the two-way table and are, therefore, less liable to error, as the numbers in marginal classes are larger.

In deriving estimates of the effects of the two factors, note also has to be taken of the fact that the two factors are not necessarily orthogonal or independent, so that a part of their effects is confounded in the sense that it is ascribable to either of the two. It is necessary to apportion properly such confounded portion between the two, lest it may be doubly added when the two factor effects are added to obtain the joint effect. This has been done and the factor effects so derived are a little graduated in order to remove obvious chance effects.

**Publications of the Gokhale Institute of Politics and
Economics, Poona 4**

- No. 1: The Salaries of Public Officials in India—By D. R. Gadgil, 1931. (Out of print.)
- No. 2: Imperial Preference for India, (The Ottawa Agreement Examined)—By D. R. Gadgil, 1932. (Out of print.)
- No. 3: A Survey of the Marketing of Fruit in Poona—By D. R. Gadgil and V. R. Gadgil, 1933. (Out of print.)
- No. 4: A Survey of Motor-Bus Transportation in Six Districts of the Bombay Presidency—By D. R. Gadgil and L. V. Gogate, 1935. (Out of print.)
- No. 5: Urban Handicrafts of the Bombay Deccan—By N. M. Joshi, M.A., 1936. (Out of print.)
- No. 6: Legislative Protection and Relief of Agriculturist Debtors in India—By K. G. Sivaswamy, 1939. (Out of print.)
- No. 7: A Survey of Farm Business in Wai Taluka—By D. R. Gadgil and V. R. Gadgil, 1940. (Out of print.)
- No. 8: The Population Problem in India: A Regional Approach—By N. V. Sovani, 1942. (Out of print.)
- No. 9: Regulation of Wages and other Problems of Industrial Labour in India—By D. R. Gadgil. (Reprint, 1945.) Price, Rs 5 or 10s.
- No. 10: War and Indian Economic Policy—By D. R. Gadgil and N. V. Sovani, Demy 8vo. pp. 160. (Second Edition, 1944.) Price, Rs 7-8-0 or 15s.
- No. 11: The Aborigines—"So-Called"—and Their Future—By G. S. Ghurye, Professor and Head of the Department of Sociology, University of Bombay. Demy 8vo. pp. 232, 1943. Price, Rs 8 or 16s.
- No. 12: Poona: A Socio-Economic Survey, Part I: Economic—By D. R. Gadgil, Assisted by the Staff of the Institute. Royal 8vo. pp. 300. 1945. Price, Rs 15 or 30s.
- No. 13: Federating India—By D. R. Gadgil. Demy 8vo. pp. 107. 1945. Price, Rs 6 or 12s.
- No. 14: A Socio-Economic Survey of Weaving Communities in Sholapur (Being a part of "Sholapur: A Socio-Economic Survey")—By R. G. Kakade. Demy pp. 221. 1947. Price, Rs 10 or 20s.
- No. 15: The Federal Problem in India—By D. R. Gadgil. Demy pp. 200. 1947. Price, Rs 8 or 16s.
- No. 16: Bombay Finance, 1921-1946—By T. M. Joshi, Demy pp. 220. 1947. Price, Rs 7-8-0 or 15s.
- No. 17: Economic Effects of Irrigation (Report of a Survey of the Direct and Indirect Benefits of the Godavari and Pravara Canals)—By D. R. Gadgil, Demy 8vo. pp. 184. Price. Rs 8 or 16s.

R. R. Kale Memorial Lectures

- 1938: The Social Process—By Dr. G. S. Ghurye, Professor of Sociology, Bombay University. Price, As. 8.
- 1939: Federation Versus Freedom—By Dr. B. K. Ambedkar, M.A., Ph.D., D.Sc., M.L.A., J.P., Bar-at-Law. Price, Re. 1.
- 1941: The Problem of Aborigines in India—By A. V. Thakkar, L.C.E. Price, Re. 1.
- 1942: A Plea for Planning in Co-operation—By Vaikunth L. Mehta, B.A. Price, As. 12. (Out of print.)
- 1943: The Formation of Federations—By G. S. Vaze, Price, Re. 1-8-0.
- 1948: Central Banking in India: A Retrospect—By Sir Chintaman D. Deshmukh, Governor, Reserve Bank of India. Price, Re. 1-8-0.

Publication No. 19:

Will be out in October.

*** REPORTS OF THE COMMODITY PRICES BOARD IN 1947**

Edited By

Royal 8vo. pp. 300] N. V. SOVANI [Price, Rs. 10 or 20s.

Foreword.—(Price Fixation in a Controlled Economy
by D. R. Gadgil)

Editorial Note on Indian Economy during 1945-48

Reports on:

- (1) Prices of Rabi Grains and Pulses for 1947-48
- (2) Controls and Their Continuance
- (3) Cotton—Time of Announcement and Clarification
- (4) Cotton—Export Duty
- (5) Vanaspati—Control and Prices
- (6) Pulses
- (7) Cotton
- (8) Cloth
- (9) Steel
- (10) Prices of Kerosene and Motor Spirit
- (11) Prices of Coal in Bengal and Bihar
- (12) Revision of Control Prices of Paper

Appendix.—Notes regarding Action taken by Government on
the Commodity Prices Board Reports.

Publication No. 20:

SOME OBSERVATIONS

ON

THE DRAFT CONSTITUTION OF INDIA

BY

Demy 8vo. pp. 75*] D. R. GADGIL [Price, Rs. 3 or 6s.

*Approximate

**Publications of the Gokhale Institute of Politics and
Economics, Poona 4**

- No. 1: The Salaries of Public Officials in India—By D. R. Gadgil, 1931. (Out of print.)
- No. 2: Imperial Preference for India, (The Ottawa Agreement Examined)—By D. R. Gadgil, 1932. (Out of print.)
- No. 3: A Survey of the Marketing of Fruit in Poona—By D. R. Gadgil and V. R. Gadgil, 1933. (Out of print.)
- No. 4: A Survey of Motor-Bus Transportation in Six Districts of the Bombay Presidency—By D. R. Gadgil and L. V. Gogate, 1935. (Out of print.)
- No. 5: Urban Handicrafts of the Bombay Deccan—By N. M. Joshi, M.A., 1936. (Out of print.)
- No. 6: Legislative Protection and Relief of Agriculturist Debtors in India—By K. G. Sivaswamy, 1939. (Out of print.)
- No. 7: A Survey of Farm Business in Wai Taluka—By D. R. Gadgil and V. R. Gadgil, 1940. (Out of print.)
- No. 8: The Population Problem in India: A Regional Approach—By N. V. Sovani, 1942. (Out of print.)
- No. 9: Regulation of Wages and other Problems of Industrial Labour in India—By D. R. Gadgil. (Reprint, 1945.) Price, Rs 5 or 10s.
- No. 10: War and Indian Economic Policy—By D. R. Gadgil and N. V. Sovani, Demy 8vo. pp. 160. (Second Edition, 1944.) Price, Rs 7-8-0 or 15s.
- No. 11: The Aborigines—"So-Called"—and Their Future—By G. S. Ghurye, Professor and Head of the Department of Sociology, University of Bombay. Demy 8vo. pp. 232, 1943. Price, Rs 8 or 16s.
- No. 12: Poona: A Socio-Economic Survey, Part I: Economic—By D. R. Gadgil, Assisted by the Staff of the Institute. Royal 8vo. pp. 300. 1945. Price, Rs 15 or 30s.
- No. 13: Federating India—By D. R. Gadgil. Demy 8vo. pp. 107. 1945. Price, Rs 6 or 12s.
- No. 14: A Socio-Economic Survey of Weaving Communities in Sholapur (Being a part of "Sholapur: A Socio-Economic Survey")—By R. G. Kakade. Demy pp. 221. 1947. Price, Rs 10 or 20s.
- No. 15: The Federal Problem in India—By D. R. Gadgil. Demy pp. 200. 1947. Price, Rs 8 or 16s.
- No. 16: Bombay Finance, 1921-1946—By T. M. Joshi, Demy pp. 220. 1947. Price, Rs 7-8-0 or 15s.
- No. 17: Economic Effects of Irrigation (Report of a Survey of the Direct and Indirect Benefits of the Godavari and Pravara Canals)—By D. R. Gadgil, Demy 8vo. pp. 184. Price, Rs 8 or 16s.

R. R. Kale Memorial Lectures

- 1938: The Social Process—By Dr. G. S. Ghurye, Professor of Sociology, Bombay University. Price, As. 8.
- 1939: Federation Versus Freedom—By Dr. B. K. Ambedkar, M.A., Ph.D., D.Sc., M.L.A., J.P., Bar-at-Law. Price, Re. 1.
- 1941: The Problem of Aborigines in India—By A. V. Thakkar, L.C.E. Price, Re. 1.
- 1942: A Plea for Planning in Co-operation—By Vaikunth L. Mehta, B.A. Price, As. 12. (Out of print.)
- 1943: The Formation of Federations—By G. S. Vaze, Price, Re. 1-8-0.
- 1948: Central Banking in India: A Retrospect—By Sir Chintaman D. Deshmukh, Governor, Reserve Bank of India. Price, Re. 1-8-0.

Publication No. 19:

Will be out in October.

REPORTS OF THE COMMODITY PRICES BOARD IN 1947

Edited By

Royal 8vo. pp. 300] N. V. SOVANI [Price, Rs. 10 or 20s.

Foreword.—(Price Fixation in a Controlled Economy
by D. R. Gadgil)

Editorial Note on Indian Economy during 1945-48

Reports on:

- (1) Prices of Rabi Grains and Pulses for 1947-48
- (2) Controls and Their Continuance
- (3) Cotton—Time of Announcement and Clarification
- (4) Cotton—Export Duty
- (5) Vanaspati—Control and Prices
- (6) Pulses
- (7) Cotton
- (8) Cloth
- (9) Steel
- (10) Prices of Kerosene and Motor Spirit
- (11) Prices of Coal in Bengal and Bihar
- (12) Revision of Control Prices of Paper

Appendix.—Notes regarding Action taken by Government on
the Commodity Prices Board Reports.

Publication No. 20:

SOME OBSERVATIONS

ON

THE DRAFT CONSTITUTION OF INDIA

BY

Demy 8vo. pp. 75*] D. R. GADGIL [Price, Rs. 3 or 6s.

*Approximate

Forthcoming Publications

(In preparation)

1. Poona: A Socio-Economic Survey: Part II—Sociological.
2. Sholapur: A Socio-Economic Survey.
3. Social Survey of Kōlhapur City: Part II—Industry, Trade and Labour.

Agents for the sale of our publications in the United Kingdom:

B. F. Stevens & Brown, Ltd., New Ruskin House,
28-30 Little Russel Street, London, W. C. 1