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THE DEMOGRAPHIC ANALYSIS OF A VILLAGE IN
TOKUGAWA JAPAN: KANDO-SHINDEN OF
OWARI PROVINCE, 1778-1871⁽¹⁾

BY AKIRA HAYAMI

I. SHŪMON-ARATAME-CHŌ AS A SOURCE FOR HISTORICAL DEMOGRAPHY

The Tokugawa government, as a result of its anti-Christian policy, began to rigorously enforce during the period 1630-1671 the regulations ordering an investigation of the religious faith of every person and his registration as a Buddhist. Every Japanese, regardless of his status, had to obtain a certificate from the temple to which he was affiliated verifying that he was a Buddhist, not a Christian. This was then reported by the village officials to the lord of the domain in which he lived. Warriors, court officials, townsmen, farmers, and even Buddhist and Shintō priests were included in this survey. Farmers, who comprised the great majority of the population, were in principle required from about 1670 to register their religious faith in their villages every year. Thus the custom of keeping *shūmon-aratame-chō* or religious investigation registers was established.

There were, of course, exceptions to this registration system. Kanazawa domain exempted all persons under age fifteen from the registration. Wakayama domain carried out the registration only once every six years and then only included persons over age eight. In general, however, every domain carried out the registration every year, thus putting its entire populace down in historical records. This system lasted for two centuries.

Another type of population survey, the *ninbetsu-chō*, also existed in the Tokugawa period. As early as the beginning of the seventeenth century daimyō took a census of the population within their domains.⁽²⁾ The object of these surveys was to learn how much labor service could be borne by the agricultural population. It is doubt-

(1) This essay is based on two previously published works by the author: *Tokugawa kōki owari ichi nōson no jinkōtōkei*. The Vital Statistics in a Late-Tokugawa Village—A Quantitative Analysis of the *Shūmon-aratame-chō*, 1778-1871," *Mita-gakkai-zasshi*, Vol. 59, No. 1, 1966; and "Tokugawa kōki owari ichi nōson no jinkōtōkei zokuhen." (An Application of the Family Reconstitution Method to the Historical Demography in Tokugawa Japan), *Mita-gakkai-zasshi*, Vol. 60, No. 10, 1967.

This analysis is the result of a group effort. The persons mentioned below cooperated in the organization, utilization and tabulation of historical materials: Miss Junko Asai of the *Mombushō Shiryō kan*, Mr. Minoru Yasumoto, Miss Nobuko Uchida, Mrs. Ikuko Miyake, and Miss Mizue Matsuda. Mrs. Hiroko Hayami, the author's wife, was also very helpful. That work of this sort takes a considerable amount of labor and expense will be seen by any person who has had a similar experience, and the author feels greatly indebted to these persons.

(2) For information on the contents of these demographic materials, see Akira Hayami, "The Population at the Beginning of the Tokugawa Period—An Introduction to the Historical Demography of Preindustrial Japan," *Keio Economic Studies*, Vol. 4, 1967.

ful whether all feudal lords conducted this sort of investigation. The important fact, however, is that this type of census came to be coordinated with the religious registration, the main object of which was not an enumeration of the population. The merging of these two surveys resulted in the inclusion in the *shūmon-aratame-chō*, or religious investigation registers, of the sex, status, and age of the persons in a family in addition to the confirmation of religious faith. The number of domestic animals and the cultivated acreage possessed by a family and its annual yield were often included. The annual yield of a family was often used as an index to land productivity.

Not all lords adopted the same form of registration. For example, some of the registers fail to give even the ages of the persons registered. Generally speaking, however, the *shūmon-aratame-chō* of the areas under the direct control of the Shogunate were good enough to be used as census data because they included information on the ages, family relations, births, deaths, and changes in the whereabouts of family members. These documents were actually utilized by the provincial governments for census purposes in Tokugawa Japan.

The fact that *shūmon-aratame-chō* were used for census purposes does not mean, though, that there existed a regular census system of a kind necessary for the administration of a modern government. But with a bit of stretching it could be said there existed a sort of yearly census in every village in Japan during the period from 1670–1871. Even after the Meiji Restoration family registration was not carried out every year but was often undertaken through the modification of a previously conducted survey by adding or deleting whatever necessary. This family registration used in conjunction with the census which was conducted every five years from 1920 on constitutes useful demographic material for modern Japan. But because of the change in the method of family registration and because the census was undertaken only once in five years, in many ways the Tokugawa *shūmon-aratame-chō* provide better demographic data. And imperfect as the registration system was in the Tokugawa period, it is more surprising to learn that an annual family registration was made in a premodern society like that of Tokugawa Japan. This registration may have resulted from the special social conditions under the Tokugawa regime. In any case, this is a phenomenon unique to Japan.

The first question to be raised with regard to the *shūmon-aratame-chō* is how reliable they are. At first glance, one is taken aback by the number of inaccuracies. For example, the births that occurred after the registration had been taken in one year should appear in the following year's register, but some children were not entered until they were three or four years old. If birth rates are calculated without regard for these omissions, they are "so low as to be improbable."⁽³⁾ This is true of the death rates too.

Another important factor in determining the reliability of the *shūmon-aratame-chō* is figuring who among the registered family members was actually living in the

(3) Irene Taeuber: *The Population of Japan*, 1958, p. 29.

village. It was ruled that the resident registered should be one who was actually living in a family in the village. In many cases, however, it is ambiguous as to whether a family member refers to person actually living in the family or merely a registered member who is in fact living elsewhere. In actual practice absent members were often registered while in other cases persons who were actually living in a family were omitted from the register. Also, some people registered their faith anonymously.

With the coming of the nineteenth century and a greater mobility of the population, the reliability of the registers was lowered. In general, the number of persons not entered in the registers increased in cities where the demand for workers had increased as a result of commercial development and the development of manufacture. On the other hand, in agricultural villages, the actual number of residents was often less than the number recorded in the *shūmon-aratame-chō*.

There are also problems which result from the unit upon which the *shūmon-aratame-chō* were based. The village was the basic unit used. Some villages, however, were under the control of more than one daimyo and there exist examples of the register for one village being divided into a number of parts, each held by a different daimyo. In large villages *shūmon-aratame-chō* were often made up separately by the religious sects to which the villagers respectively belonged. Therefore, it was possible for members of a family to be listed in different registers, as there were no restrictions against marriage between different religious sects. Thus the demographic information obtained from various registers often proves to be of little value unless all of the various parts of the register can be located.

Another problem in using the *shūmon-aratame-chō* as a source for demographic data has to do with the calculation of age. It was the custom in Japan to count a person one year old at birth, and to add one year at the beginning of every new calendar year. Thus it is necessary to subtract approximately one year from every age mentioned in order to obtain the age according to the Western method of calculation. Also, babies who were born in a specific year and died before registration was undertaken were not registered. It is therefore very difficult to estimate the birth rate using *shūmon-aratame-chō*.

The *shūmon-aratame-chō* of Kando-shinden⁽⁴⁾ used in this study contain the weaknesses described above. Adjustments were made wherever possible, but the greatest weakness still remains. This was that marriages were reported a year or two after they had taken place. The result is that births were often registered before the marriages were, and thus the reliability of statistics concerning marriages and births is low. But here we have for the first time proof that some marriages took place in the year preceding the one in which they were registered, a fact which results in a number of premarital births.

The wives were divided into two groups according to the dates of their births with 1800 the boundary year. It was found that 9%, or 31 out of the total number

(4) *Shinden* means "new field," that is, a newly settled agricultural village.

of 341 births, in the first period occurred before the formal registration of marriage. Less than 5%, or 23 out of a total of 483 births, took place before registration of marriage in the period following 1800. It required a considerable amount of thought to decide whether these births should be treated in the same way as births which occurred within a registered marriage. Because of the numerous problems involved in dealing with these births, we disregarded them and decided to be satisfied with an insight into the relationship between marriage and births.

In view of all of the above considerations, it is obvious that the second period is higher than the first in terms of statistical reliability. We might also mention here that the reason we divided the statistical data into two periods was not for the purpose of showing the mere numerical difference between the two, but to bring out the difference in the degree of reliability between these two periods.

Presenting the inadequacy of this historical material as statistical sources will disappoint the reader, but these problems exist in any quantitative study of history and are by no means limited to studies based on *shūmon-aratame-chō*. On the contrary, the information in these registers is far more reliable than many other historical source materials, as for example the documents on the land tax. This is because there was practically no reason for a registrar, the village official in charge, to consciously turn in an inexact report, unlike a village tax official. In other words, the size of a village's population had no direct relationship with the villagers' financial burden.

Thus the inexactness of this material seems to lie either in the system or in inadvertent errors committed. In some cases, therefore, when dealing with this kind of historical material with figures ranging over a number of years or even decades, historians may be able to make adjustments for inaccuracies. If *shūmon-aratame-chō* can be obtained which are of superior quality covering an entire village for a number of successive years and containing detailed information on births, deaths, and population movements, it is possible to carry out an historical survey of the demography of a village with a fairly high degree of reliability.

Other historical studies of demography which have depended on *shūmon-aratame-chō* for basic data do exist, but these works, with one exception,⁽⁵⁾ are not satisfactory in terms of the length of time covered. Other studies have been merely elementary historical surveys of population based on figures of chance discovery. The author, with consideration for the significance of demography in the study of economic history and the importance of numerical research in the acquisition of knowledge broader than economics, has organized an informal group of people to carry out a nationwide hunt for *shūmon-aratame-chō* so that good data can be found and scientifically analyzed. The results of our efforts made since 1965 have been published and a series of *shūmon-aratame-chō* have been microfilmed to be utilized

(5) A Study Group of Nomura Seminar for Kōmi-mura: "Ōgaki-han-ryō Mino-no-kuni Motosu-gun Kōmi-mura no kokō tōkei," (Statistical Survey on the Population of Kōmi-mura, Motosu Gun, Mino-no-kuni—1674–1872) *Mita Gakkai Zasshi*, Vol. LIII, Nos. 10, 11, combined, 1960.

by scholars at large.⁽⁶⁾

Obvious questions arise with regard to the value of the *shūmon-aratame-chō* as a basis for demographic studies in comparison with the parish register of the European countries. There are a number of advantages and disadvantages in using *shūmon-aratame-chō*. One advantage is that the *shūmon-aratame-chō* enables us to get at the total population in an area and make gross estimations of population movements as well as the natural increase and decrease of the people in one area. Not only is it possible to make time-series analyses, but unlike Western Europe, it is also possible to make cross-sectional analyses. One disadvantage is that in terms of time these registers cover only the 200 years from 1671–1871, 100 years less than is covered by the parish register. Second, while in Europe the time lapse between a birth and the recording of it was usually relatively short, due to the registration system in Japan, as much as a year could pass between an actual birth and its registration. Thus infant mortality is extremely hard to get at in Japan. Finally, many of the *shūmon-aratame-chō* are in the possession of private individuals, making it very difficult to obtain a complete set of registers ranging over the 200 years. However, a good register in Japan, if obtained, is more useful in effecting an analytical study of demography than the parish register. It is much easier to work on family reconstitution in Japan than in Western Europe because it is not necessary to gather data on one family from scattered sources.

Family reconstitution was begun in France in the 1950's. It is one of the projects being carried out in the 1960's by the Cambridge Group for the History of Population and Social Structure. Thus we in Japan are looking forward to being able to launch out in the near future on an international cross-comparison with the

(6) Akira Hayami: "Tokugawa kōki Owari ichi nōson no jinkō-tōkei. (The Vital Statistics in a Late-Tokugawa Village—A Quantitative Analysis of the *Shūmon-aratame-chō*, 1778–1871) *Mita Gakkai Zasshi* Vol. 59, No. 1, 1966.

"Kokura-han jinchiku-aratame-chō no bunseki to Tokugawa shoki zenkoku jinkō-suikei no kokoromi," (An Estimation of the Gross Population in Japan at the Beginning of the 17th Century). *Mita Gakkai Zasshi* Vol. 59, No. 3, 1966.

"Shūmon-aratame-chō o tsūjite mita shinshū Yokouchi-mura no chōki jinkō-tokei," (The Demographic Aspects of a Rural Village in Tokugawa Japan, 1671–1871) *Keizaigaku Nempō* No. 10, 1967.

"Tokugawa kōki owari ichi nōson no jinkō-tōkei, zokuhen," (An Application of the Family Reconstitution Method to the Historical Demography in Tokugawa Japan) *Mita Gakkai Zasshi* Vol. 60, No. 10, 1967.

"Kinsei Shinshū Suwa chihō no jinkō sūsei," (The Population Trends in Suwa County, 1671–1870) *Mita Gakkai Zasshi* vol. 61, No. 2, 1968.

"Kinsei Yakushima no jinkō kōzo," (Population Structure of Yaku Island in 1726) *Tokugawa Rinseishi Kenkyūjo Nempō* No. 2, 1968.

Akira Hayami and Minoru Yasumoto: "Jinkōshi kenkyū ni okeru 'Family Reconstitution'" (Family Reconstitution in Historical Demography), *Shikai Keizaishigaku* Vol. 34, No. 2, 1968.

Yōichiro Sasaki: "Bakumatsu-meiji shoki musashi-no-kuni jinkō sūsei ni kansuru ichikōsa-tsu" (The Population Trends in Musashi-no-kuni), *Mita Gakkai Zasshi* Vol. 59, No. 3, 1966.

"Tokugawa-jidai kōki toshi jinko no kenkyū", (A Study of Tennōji-mura in the Late-Tokugawa Period), *Shikai* No. 14, 1967.

cooperation of Western scholars. Meanwhile we shall continue our demographic research on Tokugawa Japan and report our findings abroad.

In this article, the first attempt to realize our objective, we will examine the *shūmon-aratame-chō* of Kando-shinden of Kaisai county for 89 years out of the 94 years from 1778–1881. Since this historical material provides useful annual time-series data, we have analyzed it using the family reconstitution method.

II. THE SHŪMON ARATAME-CHŌ OF KANDO-SHINDEN AND THE METHOD USED IN THEIR ANALYSIS

Kando-*shinden* of Kaisai country in Owari province was situated where the present villages of Tobishima and Jūshiyama are located in Ama county, Aichi prefecture, ten kilometers west of the Nagoya city limits. The area thereabouts is a delta reclaimed rapidly after the middle of Tokugawa period. Three rivers flow through the delta into Ise Bay, the Kiso, the Nikkō, and the Shōnai.

This village was settled in the early years of the 18th century by Inuyamaya Kando Bunzaemon, a timber dealer of Nagoya. It is fortunate that a study has been made by Shinzaburō Ōishi and Toshio Kikuchi on reclaimed land in the Tokugawa period. The reader is advised to consult it⁽⁷⁾ for details. Here demographic indices only are under consideration.

The fields developed by 19 farmers were first called Taihōmae-shinden and renamed Kando-shinden in 1814. This year marked an important change in the *shūmon-aratame-chō*. The *shūmon-aratame-chō* appeared for the first time in 1778 with the entry of 29 houses. This number remained unchanged up to 1813, but in one jump it increased to 47 in 1814.

In examining the description of individuals, we find that children were not uniformly entered before 1813; those under age nine were often unregistered. In 1814, however, even 1 or 2 year-old infants were recorded, and this made the registers more reliable as research material. The total population of the village was on the increase in 1813; one family had more than 20 members. Of course, this was just a simulated number.

This situation should be explained by a group of even later settlements that had further branched off from Kando-shinden. We find in the *shūmon-aratame-chō* after 1826 *shinden* newly opened up by the farmers of Kando-shinden in addition to Kando-shinden, the main *shinden*. These *shinden* include: Fukuoka-shinden including Sasano-gō⁽⁸⁾, Kodai-gō, Shimono-gō and Izumi-gō; Masanari-shinden; Hatsuho-shinden; Asahi-shinden; Yomakura-shimo-shinkai. For example, we

(7) Shinzaburō Ōishi: "Chōnin ukeoi shinden no seiritu jijō—kando-shinden no baai", (The Conditions for the Exploitation of Kando-shinden by Townsman Contractors), *Shigaku-zasshi*, Vol. 60, No. 9, 1951.

Toshio Kikuchi: "Chōnin ukeoi shinden ni kansuru jakkan no oboegaki." (Some Notes on *Shinden* Exploitation by Townsman Contractors), *Jinmon-chiri*, Vol. 6, No. 4, 1954.

(8) *gō*=hamlet

find descriptions such as "the house built in Sasano-gō of Fukuoka-shinden." These villages suddenly appear in the register of 1814.

Furthermore, we find some family lineage descriptions in the *shūmon-aratame-chō* in and after 1831. These include, for example, "moved from Higashi Fukuda village, Kaitō country in 1708," and "branched out from the Shinzaemon family and built a house at Sasano-gō, Fukuoka-shinden in 1803," the former indicating that he was one of the settlers of the village and the latter, a branch family. And it is clear that the branch houses newly built in Fukuoka-shinden and other new villages were not started suddenly in 1814, but developed gradually from 1803. In tracing the lineages of the branch houses back to their origins, it seems obvious that there were no such large extended family units before 1813; the fact was that there existed small family units who formed a large family group only on paper.

Thus, the change of a village name around 1814, as was the case of Kando-shinden, can be explained by the fact that the village had been unrecognized before 1814, but came to be officially recognized that year. In other words, the families who had been "living together on paper" up to that time came to be described as independent households which they in fact were.

The *Shūmon-aratame-chō* of Kando-shinden were in the hands of townsmen contractors for the most part. They were presented to Bunzaemon Kando, the master of the *shinden*, and were kept by him, instead of being presented directly to the provincial lord as was the practice with ordinary villages. Whatever may be the nature of the *shinden*, this *shinden* seems to be a good example of how a population shift occurred at a place where the amount of arable land could be easily expanded.

We organized this *shinden* data in the following way: First we made a card for each of the families, noting such basic matters as the name, sex, age and relationships of its members, as well as their mobility, with the reasons, if known. Then we arranged these cards chronologically and according to family affiliations, when necessary for the convenience of our statistical observations. (The details of this system will be explained later in connection with actual cases.) We filed about 5,000 of these cards. The compilation was not too difficult as the members of each family were registered as parishioners of the same temple.

These basic family cards were arranged according to each couple's demographic characteristics with regard to marriage, the number of children born to them, death, etc. In other words, in order to conduct a kind of follow-up investigation, we prepared a FRF (Family Reconstitution Form).⁽⁹⁾ In fact, it was not necessary to carry out family reconstitution, as the *shūmon-aratame-chō* were organized

(9) The work of this sort as conducted in England and France is called family reconstitution, and the cards made for that purpose are named FRF. Since our cards were generally modelled after their examples, we decided to designate ours FRF also.

See FRF in the *An Introduction to English Historical Demography*, edited by E. A. Wrigley, 1966, p. 146, and for a more original work refer to Louis Henry: *Anciennes familles Genevoises*, 1956, p. 23, or, Etienne Gautier and L. Henry: *La population de Crulai paroisse Normande*, 1958, p. 42.

TABLE I. NUMBER OF HOUSEHOLDS AND POPULATION

	Population			Population Kando-shinden proper	Number of households									Average family size	Sex ratio	
	Male	Female	Total		Kando-shinden proper	Fukuoka-shinden				Masa-nari-shinden	Hatsu-ho-shinden	Asahi-shinden	Yoma-kura-shimo-shinkai			Total
						Sasa-no-gō	Kodai-gō	Shimo-no-gō	Izumi-gō							
1778	79	83	162		29								29	5.59	95.2	
1779	79	82	161		29								29	5.55	96.3	
1780	75	85	160		29								29	5.52	88.2	
1781	75	88	163		29								29	5.62	85.2	
1782		missing														
1783	78	87	165		28								28	5.89	89.7	
1784	77	88	165		28								28	5.89	87.4	
1785	82	91	173		28								28	6.18	90.2	
1786	88	93	181		28								28	6.46	94.7	
1787	91	95	186		28								28	6.64	95.8	
1788	90	87	177		28								28	6.32	103.4	
1789	95	88	183		28								28	6.54	105.8	
1790	98	94	192		28								28	6.86	104.2	
1791	97	96	193		29								29	6.66	101.0	
1792	97	95	192		29								29	6.62	102.1	
1793	98	97	195		29								29	6.72	101.0	
1794	97	93	190		29								29	6.55	104.2	
1795	100	93	193		29								29	6.66	107.5	
1796		missing														
1797	105	97	202		29								29	6.97	108.2	
1798	103	99	202		29								29	6.97	104.0	
1799	103	99	202		29								29	6.97	104.0	
1800	103	100	203		30								30	6.77	103.0	
1801	102	103	205		30								30	6.83	99.0	
1802	104	106	210		30								30	7.00	98.1	
1803	106	106	212	193	30	3	2						35	6.06	100.0	
1804		missing														
1805	112	108	220	180	31	4	4		1				40	5.50	103.8	
1806	112	112	224	182	31	4	4		1				40	5.60	100.0	
1807	115	117	232	186	31	4	4		2				41	5.66	98.3	
1808	114	116	230	174	31	6	5		2				44	5.23	98.3	
1809	115	121	236	177	32	6	5		2				45	5.24	95.1	

TABLE I

(continued)

	Population			Population Kando- shinden proper	Number of households									Average family size	Sex ratio	
	Male	Female	Total		Kando- shinden proper	Fukuoka-shinden				Masa- nari- shinden	Hatsu- ho shinden	Asahi- shinden	Yoma- kura- shimo- shinkai			Total
						Sasa- no-gō	Kodai- gō	Shimo- no-gō	Izumi- gō							
1810	122	126	248	186	32	6	5		2				45	5.51	96.8	
1811	125	126	251	185	32	7	5		2				46	5.46	99.2	
1812	127	125	252	187	32	7	5		2				46	5.48	101.6	
1813	128	126	254	187	32	7	5		2				46	5.52	101.6	
1814	133	129	262	190	33	7	5		2				47	5.57	103.0	
1815	130	128	258	186	33	7	5		2				47	5.49	101.5	
1816	126	130	256	182	33	7	5		2				47	5.45	96.9	
1817	127	132	259	181	33	9	5		2				49	5.28	96.2	
1818	129	134	263	183	33	9	5		2				49	5.37	96.3	
1819	128	142	270	189	35	9	5		2				51	5.30	90.2	
1820	133	149	282	198	36	9	5		2				52	5.42	89.3	
1821	134	159	293	211	36	9	5		2				52	5.63	84.3	
1822	132	162	294	210	36	9	6		2				53	5.55	81.5	
1823	135	157	292	209	36	9	6		2				53	5.51	86.0	
1824	135	165	300	207	36	10	6		2				54	5.56	81.8	
1825	139	172	311	208	37	10	6		2				55	5.65	80.8	
1826	144	171	315	207	36	12	6		2				56	5.63	84.2	
1827	143	172	315	199	36	12	6		2	3		1	60	5.25	83.1	
1828	141	171	312	200	36	12	6		2	3			59	5.29	82.5	
1829	145	178	323	209	37	12	6		2	2			59	5.47	81.4	
1830	150	183	333	214	37	12	6		2	2			59	5.64	82.0	
1831	149	184	333	215	37	12	6		2	2			59	5.64	81.0	
1832	153	181	334	215	37	12	6		2	2			59	5.66	84.5	
1833	160	182	342	220	37	12	6		2	2			59	5.80	87.9	
1834	159	179	338	215	37	12	6		2	2			59	5.73	88.8	
1835	158	176	334	212	37	11	6		2	2			58	5.76	89.8	
1836	162	176	338	213	37	11	6		2	2			58	5.83	92.0	
1837	163	172	335	218	39	11	6		1	2	2		61	5.49	94.7	
1838	170	175	345	222	39	11	5		1	2	2		60	5.75	97.1	
1839	163	172	335	218	39	11	5		1	2	2		60	5.58	94.8	
1840	167	178	345	223	39	11	5	1	1	2	2		61	5.66	93.8	

TABLE I.

(continued)

	Population			Population Kando- shinden proper	Number of household										Average family size	Sex ratio
	Male	Female	Total		Kando- shinden proper	Fukuoka-shinden				Masa- nari- shinden	Hatsu- ho shinden	Asahi- shinden	Yoma- kura- shimo- shinkai	Total		
						Sasa- no-gō	Kodai- gō	Shimo- no-gō	Izumi- gō							
1841	177	185	362	228	38	11	5	1	1	2	2			60	6.03	95.6
1842	182	183	365	233	38	11	5	1	1	2	2			60	6.08	99.4
1843	176	172	348	221	38	10	5	1	1	2	2			59	5.90	102.2
1844	178	171	349	219	38	10	5	1	1	2	2			59	5.92	104.1
1845	181	175	356	222	39	10	5	1	1	2	2			60	5.93	103.3
1846	184	173	357	224	39	10	5	1	1	2	2			60	5.95	106.3
1847	183	168	351	220	38	10	5	1	1	2	2			59	5.95	108.9
1848	189	171	360	224	38	10	6	1	1	2	2			60	6.00	110.5
1849		missing														
1850	198	182	380	234	38	11	6	1	1	2	2			61	6.23	108.8
1851	199	184	383	233	38	11	6	1	1	2	2			61	6.28	108.1
1852	196	185	381	229	38	11	6	1	1	2	2			61	6.25	106.0
1853	201	184	385	229	38	11	6	1	1	2	2			61	6.31	109.2
1854	199	184	383	227	38	11	6	1	1	2	2			61	6.28	108.1
1855	203	191	394	241	36	11	6	1		2	2			59	6.68	106.2
1856	203	195	398	239	36	11	7	1		2	2	1		60	6.63	104.0
1857	208	204	412	250	36	11	7	1		2	2	1		60	6.87	102.0
1858	208	206	414	246	36	11	7	1		2	2	1		60	6.90	101.0
1859	210	208	418	246	36	12	8	1		2	2	1		62	6.74	101.0
1860	210	205	415	245	36	12	8	1		2	2	1		62	6.69	102.4
1861	205	200	405	237	36	13	8	1		2	2	1		63	6.43	102.5
1862	205	201	406	241	36	13	8	1		2	2	1		63	6.44	102.0
1863	210	201	411	241	36	13	8	1		2	2	1		63	6.52	104.3
1864	213	203	416	242	36	13	9	1		2	2	1		64	6.50	105.0
1865	214	202	416	243	35	13	9	1		2	2	1		63	6.60	106.0
1866	214	204	418	245	36	13	9	1		2	2	1		64	6.53	105.0
1867	217	210	427	249	36	13	9	1		2	2	1		65	6.67	103.2
1868	217	210	427	248	36	14	9	1		2	2	1		65	6.57	103.2
1869	215	211	426	241	36	14	9	1		2	2	1		65	6.55	101.9
1870		missing														
1871	205	205	410	225	36	15	9	1		2	2	1		66	6.21	100.0

TABLE II. INCREASE AND

Year	Increase																	
	Birth			Marriage and Adoption			Divorced			Others			Unknown			Total		
	m	f	t	m	f	t	m	f	t	m	f	t	m	f	t	m	f	t
1837	12	5	17		5	5										12	10	22
1838		6	6	1	1	2				1		1				2	7	9
1839	7	7	14		2	2	1	2	3							8	11	19
1840	11	6	17	2	6	8					1	1				13	13	26
1841	6	4	10					2	2							6	6	12
1842	5	8	13		2	2										5	10	15
1843	5	6	11		1	1		1	1							5	8	13
1844	5	5	10		1	1		1	1	1		1				6	7	13
1845	7	3	10		2	2	1	1	2	1		1				9	6	15
1846	4	6	10	1	1	2		1	1				1		1	6	8	14
1847	8	5	13		4	4										8	9	17
1848	3	6	9	1	4	5				1	2	3				5	12	17
1849	8	9	17		7	7		1	1							8	17	25
1850	6	6	12	1	3	4										7	9	16
1851	2	6	8		1	1										2	7	9
1852	8	7	15		2	2							1		1	9	9	18
1853	4	8	12		5	5										4	13	17
1854	10	7	17		2	2										10	9	19
1855	5	8	13		2	2	2	2	4					1	1	7	13	20
1856	15	8	18		3	3		2	2							10	13	23
1857	6	8	14				1	2	3							7	10	17
1858	7	5	12		1	1										7	6	13
1859	4	6	10	2		2										6	6	12
1860	4	2	6		2	2										4	4	8
1861	6	9	15													6	9	15
1862	3	3	6	1	1	2	3	2	5							7	6	13
1863	7	2	9		3	3										7	5	12
1864	7	7	14		1	1										7	8	15
1865	6	4	10		3	3										6	7	13
1866	8	14	22	1	5	6										9	19	28
1867	5	5	10													5	5	10
1868	4	6	10		3	3										4	9	13
1869	8	8	16		2	2							2	2		8	12	20
1870	6	4	10		1	1										6	5	11
Total			416			86			25			7			5			539

DEMOGRAPHIC ANALYSIS OF A VILLAGE

DECREASE OF POPULATION

Decrease																					Total						
Death			Marriage and Adoption			Divorced			Unregistered			Emigration			Others			Unknown			Total						
m	f	t	m	f	t	m	f	t	m	f	t	m	f	t	m	f	t	m	f	t	m	f	t				
4	4	8		3	3				1		1									5	7	12	+7	+3	+10		
9	6	15		4	4															9	10	19	-7	-3	-10		
3	2	5		2	2	1	1	2												4	5	9	+4	+6	+10		
2	3	5	1	3	4															3	6	9	+10	+7	+17		
1	4	5		4	4															1	8	9	+5	-2	+3		
8	8	16	2	6	8		1	1	1		1				1	1		5	5	11	21	32	-6	-11	-17		
3	3	6		6	6															3	9	12	+2	-1	+1		
2	1	3		2	2												1		1	3	3	6	+3	+4	+7		
4	3	7		4	4				1	1	2						1		1	6	8	14	+3	-2	+1		
4	4	8	1	9	10									2	2					7	13	20	-1	-5	-6		
2	4	6		2	2															2	6	8	+6	+3	+9		
2	3	5																4	4	2	7	9	+3	+5	+8		
2	6	8		2	2							1	1				2	2	2	11	13	+6	+6	+12			
6	2	8		5	5															6	7	13	+1	+2	+3		
4	5	9	1	1	2															5	6	11	-3	+1	-2		
4	8	12		2	2															4	10	14	+5	-1	+4		
6	8	14		4	4														1	1	6	13	19	-2	0	-2	
4	2	6	2		2															6	2	8	+4	+7	+11		
5	9	14	1		1									1	1					7	9	16	0	+4	+4		
4		4		2	2							1	2	3						5	4	9	+5	+9	+14		
5	5	10	1	3	4													1	1	7	8	15	0	+2	+2		
5	3	8		1	1															5	4	9	+2	+2	+4		
5	5	10		4	4				1		1									6	9	15	0	-3	-3		
8	4	12		3	3							1	2	3						9	9	18	-5	-5	-10		
6	6	12		2	2															6	8	14	0	+1	+1		
2	2	4		4	4															2	6	8	+5	0	+5		
3	2	5	1	1	2															4	3	7	+3	+2	+5		
5	7	12	1	1	2		1	1												6	9	15	+1	-1	0		
5	4	9	1	1	2															6	5	11	0	-2	-2		
3	5	8		6	6							2	1	3	1	1	2			6	13	19	+3	+6	+9		
5	4	9		1	1															5	5	10	0	0	0		
6	6	12		1	1		1	1												6	8	14	-2	+1	-1		
5	2	7																	8	10	18	13	12	25	-5	0	-5
10	10	20	1	1	2															11	11	22	-5	-6	-11		
302			103			5			5			10			6			33			464			+42 +33 +75			

around the family unit. These cards, therefore, may properly be called the follow-up investigation of the demographic behavior of married couples.

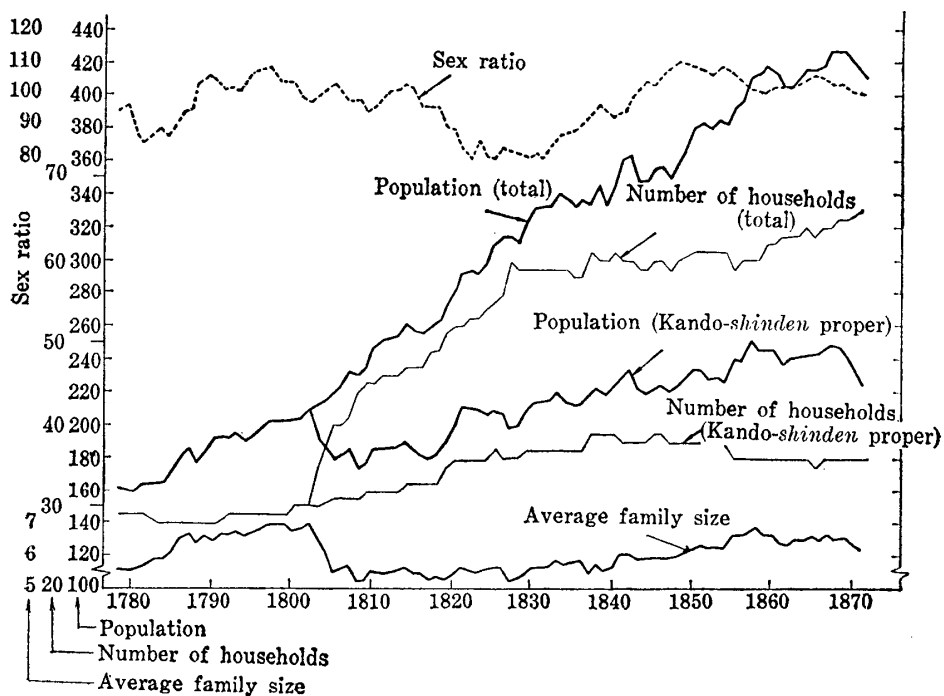
Thus, since the *shūmon-aratame-chō* were compiled in February every year, there is very little mention of one year-old infants in the historical material. Also, since registers were made according to the solar-lunar calendar, the number of days in the year was 354.5 in a normal year, and 384 in a year with an intercalary month. It is possible, therefore, that these numerical disparities affected the birth rate and the death rate of a particular year. We concluded, however, that the mathematical discrepancies were not very important as far as our material was concerned because we were dealing with just one village, and thus we disregarded them.

III. CHANGES IN THE POPULATION

Table I and Chart I, a graphic representation of Table I, show the changes in the number of houses and population, family size and sex ratio, as adjusted by the previously explained method. In other words, the number of houses presented is not the actually entered figure, but the one that was recalculated by retracing a family branching, if it was found by later historical material to have occurred. The size of the population was also adjusted, if it was found that certain births were registered for the first time some years later than they actually occurred.

The registration of the number of infants before 1814 was imperfect, and we could not prevent errors from coming into our calculations. The infants that died before the next registration could not be counted either.

Chart I. Changes in the Number of Households and Population



In examining Chart I, we find that both the number of houses and the population more than doubled in the 94 years under our consideration. The population increased from 162 to 410 during the period from 1778 to 1871, that is, an annual average increase rate of 1.1%. The period before 1833 shows an annual increase rate of 1.4%, while that after that 1833 increased at only 0.5% per year. The decline in the increase rate was largely due to a decrease in the population of the original village. The average family size was 7 just before the branching-off began, 5 after, and it increased to 6 during the 1850's. The sex ratio shows a somewhat interesting trend, repeating a wave-movement about every 30 years. The males and females were most unbalanced in 1825 with a ratio of 80.8%.

Table II. lists the increase and decrease of population after 1837 by causes, according to the 'Notes on Increase and Decrease of Population' attached to the *shūmon-aratame-chō*. Since few reasons for increases and decreases could not be learned from the Notes on Increase and Decrease of Population' before 1869, this table should be considered valuable.

The total population increase, 75 persons, during the period from the time covered by Table I to that of Table II was mainly due to a natural increase. Before 1869, for which time data are very meagre, the natural increase, which was larger than the total population increase should be attributed to the exodus due to marriages.

IV. FAMILY SIZE

Chart II shows average family size at twenty year intervals. Since it was impossible to show the family size for every one of the 94 years, and the accidental bias

Chart II. Family Size

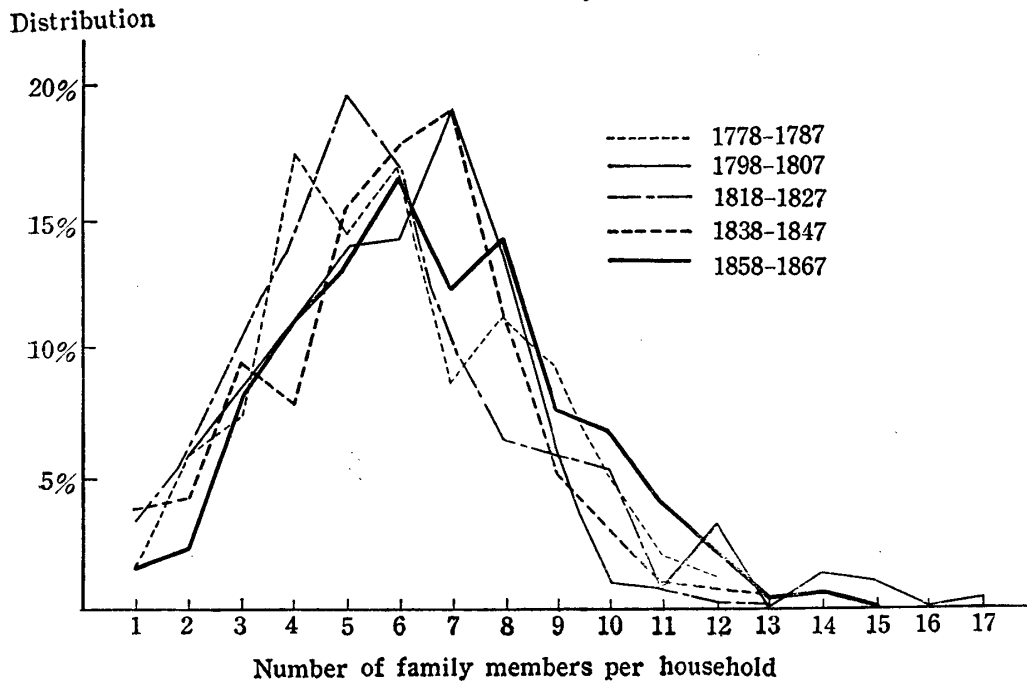
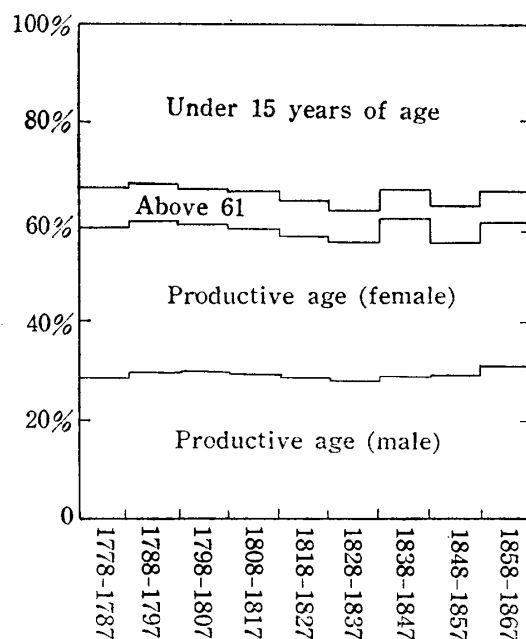


Chart IV. Population in the Productive Age Group



Looking at the chart, we find that the ratio of population of the productive years was on a gradual decrease at least before 1837; this is clearly because of the increased weight of persons under 15 in the population. As a whole, this ratio is not very different from other similar examples for the same period.⁽¹⁰⁾

VI. BIRTHS AND DEATHS

The greatest factor which influenced the demographic change of this village was the natural increase and decrease of population; after 1838, 77% of the total increase was due to births and 65% of the total decrease was due to deaths.

Table III presents five-year averages of annual birth rates after 1778.⁽¹¹⁾ The babies that were entered for the first time at age one or two were counted as births for the previous year, and those that were reported for the first time at their third year or later were added to the births of a particular calendar year by calculating the year at birth from the age at the first entry.

Since the babies who were born in the years prior to 1812 and for whom registration was very inaccurate were counted mostly by an counting backwards, it is necessary to remember this statistical manipulation in considering the real number of births. It is essential to add the babies who died in infancy, and deduct those

(10) See Table XIII in "Statistical Survey on the Population of Kōmi-mura, Motosu-gun, Minonokuni," and Table VI in "The Demographic Aspects of a Rural Village in Tokugawa Japan, 1671-1871."

(11) The birth rate here is in fact the ratio of the number of births for the people entered in the *Shūmon-aratame-cho*.

that were brought into the village from other places in very early infancy. Since, however, this mathematical operation is impossible in practice, we should accept the numbers previous to 1812 as they are, assuming that they are in fact somewhat lower than actuality.

The registration in the book 'Increase and Decrease of Population' was regular and accurate with regard to the births for the period from 1813 to 1837; practically no doubtful entries exist. The high birth rate from 1813 through 1837 was probably the highest possible birth rate for the agricultural villages of Tokugawa Japan.

The high birth rates in Table III compared with those we have come across previously are probably due to the superior quality of this material and the effective statistical adjustment, as well as to the fact that there was no or very little necessity for restricting births on account of the availability of land.

Table IV presents the five year averages of annual deaths and their rates after 1838. Since these rates were calculated from the definitely ascertained cases of death, only a very few among the "decreased number for unknown cases" was probably due to death. (See Table II for the "deaths for unknown causes.")

The real birth rates and death rates would be higher than those shown in these tables because the numbers presented in the tables have been derived from the limited number of cases entered in the *shūmon-aratame-chō*. Also, we may assume that a fairly large number of deaths occurred in the interval between births and the completion of the registers. Compared with the death rates of the Meiji Era, these rates are rather low; this comes from our being unable to compute infant mortality rates directly from the materials of the Tokugawa period.

How high the death rates of young children were is clearly shown by Table V. Presented here are the number and ages of the children under 10 who died out of the 577 that were born in the 50-year period from 1813 to 1862. As many as 21% of them died before reaching 5 years, and 28% before 10. If added to the infant deaths whose rates cannot be computed directly, the death rate of young children might be as high as 30%. (In tabulating these death rates, the loss of children due to causes other than death was ignored as we considered their influence negligible.)

Chart V portrays the length of life by sex and by the age at death of 137 males and

(12) For example, Mr. Naotarō Sekiyama presents his estimation on the basis of his own research and analysis in his article: "Tokugawa jidai no shusshōritsu oyobi shibōritsu—Sono jakkan no jitsurei" (Birth Rates and Death Rates in Tokugawa Period, Some Factual Examples), *Jinkō-mondai Kenkyū*, Vol. I, No. 3, 1940.

The examples shown there are all lower than in this article of mine, probably because of the quality of the materials he used. Mr. Sekiyama states: "Although it is impossible to draw any conclusion as the sample is small, we may consider that the birth rate of Tokugawa period was around 20‰ or 30‰."

The average birth rate of Kōmi village throughout the period from 1674 to 1866 is estimated at 17.88‰. (See the article cited above, Table XIX). This is even lower than the average death rate for the same period. This is too low, even for data which was not serial data ranging over some years. Certainly, the material requires adjustment just for this reason.

TABLE III. BIRTHS

Year	Number of births			Birth rate
	m	f	t	%
1778-1782	11	13	24	29.7
1783-1787	15	9	24	27.6
1788-1792	21	15	36	38.5
1793-1797	12	10	22	22.5
1798-1802	13	16	29	28.4
1803-1807	14	19	33	36.2
1808-1812	19	18	37	30.4
1813-1817	28	23	51	39.6
1818-1822	26	32	58	40.0
1823-1827	24	35	59	38.5
1828-1832	33	29	62	37.9
1833-1837	32	19	51	30.2
1838-1842	29	31	60	34.4
1843-1847	29	25	54	30.6
1848-1852	27	34	61	32.5
1853-1857	35	39	74	37.5
1858-1862	24	25	49	24.2
1863-1867	33	22	55	31.1
1868-1870	18	18	36	28.7
1778-1812 average				30.5
1813-1837 average				37.0
1838-1870 average				31.2
1778-1870 average				32.6

TABLE IV. DEATHS

Year	Number of deaths			Death rate
	m	f	t	%
1838-1842	23	23	46	26.2
1843-1847	15	15	30	17.0
1848-1852	18	24	42	22.4
1853-1857	24	24	48	24.6
1858-1862	26	20	46	22.8
1863-1867	21	22	43	20.6
1868-1870	21	18	39	31.2
1838-1870 average				22.9

TABLE V. CHILD DEATHS

Year of birth	Number of births	Number of deaths by age					Total	Ratio of deaths against births	Number of deaths by age					Total	Ratio of deaths against births	Survival to 11 years of age
		1	2	3	4	5			6	7	8	9	10			
1813-1817	51	1	5	4	3	3	16	0.31	1	2	1			20	0.39	31
1818-1822	58	1	2	2	6	2	13	0.23	1				1	15	0.27	43
1823-1827	59		1	5	4	1	11	0.19		2			1	14	0.24	45
1828-1832	62		4	4	2	2	12	0.19	2	1	2	1		18	0.39	44
1833-1837	51		4	4	5	1	14	0.27	1	2				17	0.33	34
Sub-total	281	2	16	19	20	9	66	0.24	5	6	2	2	3	84	0.30	197
1838-1842	60		3	5	1	1	10	0.17		1			1	12	0.20	48
1843-1847	54		5	1	1	3	10	0.19	1	2		1		14	0.26	40
1848-1852	61		3	2	2		7	0.11	1	1				9	0.15	52
1853-1857	74	1	2	7	4	3	16	0.22	2	2	2			22	0.30	52
1858-1862	49	1	6	3	3	2	15	0.31	1	2				18	0.37	31
Sub-total	298	2	19	18	11	8	58	0.19	5	4	6		2	75	0.25	223
Total	579	4	35	37	31	17	124	0.21	10	10	8	2	5	159	0.28	420

138 females who died during the 32 years between 1838 and 1869. The curve has not been smoothed; it is in broken lines. There are at present only three other sources to be compared with this one: they are from Kōmi village (previously cited); Toraiwa village, Ina country, Shinano province; and Yokouchi village, Suwa county, Shinano province.⁽¹³⁾ The common points observed from these materials are that the mortality of females less than 10 years of age is high compared with that of males, but the life expectancy for females after they have reached their fiftieth year is higher than that of males. Also, we have found that the life expectancy rate for males at 2 is 33.2, while that for females is 31.6. These figures are fairly convincing if examined in the light of the general evidence during and after the Meiji Era.

Chart VI is the mortality rate curve by logarithmic scale, showing the rate at each

(13) For child deaths in Kōmi village, consult Chart I of the essay cited previously. The life expectancy in Toraiwa village was estimated by Kazumasa Kobayashi on the basis of the report by Naotarō Sekiyama on the deaths by 5 year age gradations ranging over the 4 years from 1815 to 1818.

With regard to Yokouchi village which was reported on by the writer in his article: "The Demographical Aspects of a Rural Village in Tokugawa Japan," Kobayashi is quoted as saying that thinks the statistics of Toraiwa village are defective with reference to young children. And Kobayashi has adjusted made the number of deaths of the children less than 5 years old to twice the number reported in the historical material. See Kobayashi: "Edo jidai noson jūmin no seimeihyō." (A Life Table of Farmers of the Edo Period), *Jinkō-mondai Kenkyū*, No. 65, 1956, Chart I.

Chart V. Life Table

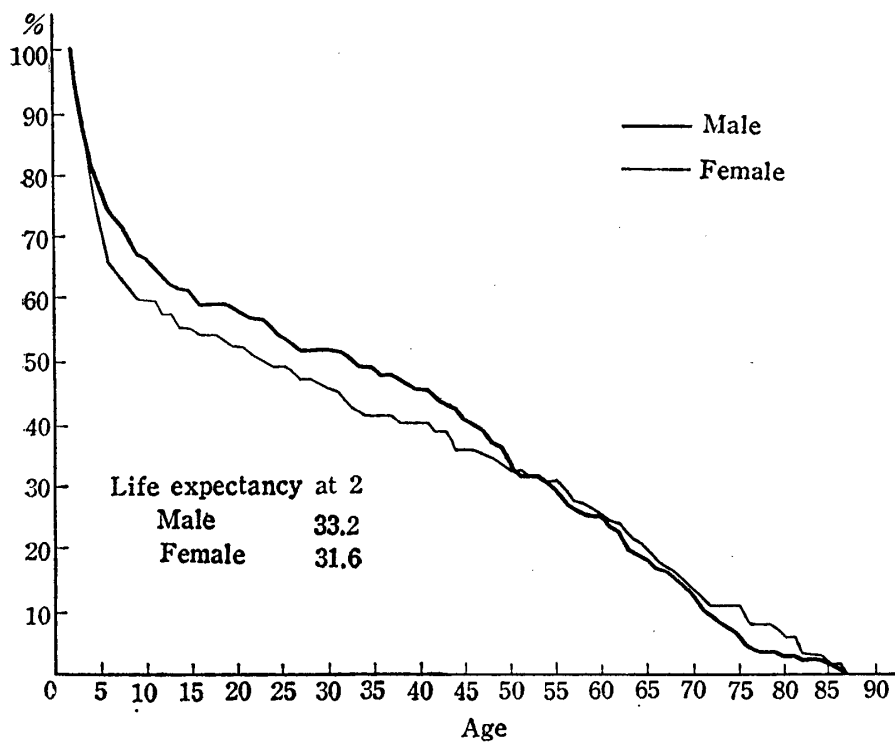
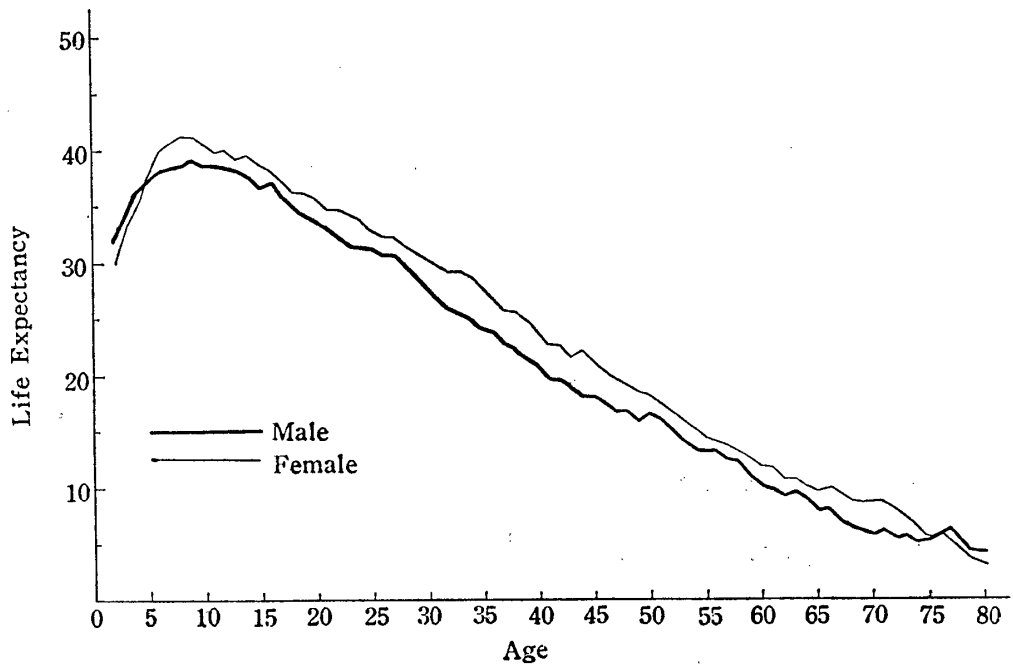


Chart VI. Mortality Table



Chart VII. Life Expectancy by Age



age of children under 5, and the rates for the persons above 5 by 5 year age gradations. Since the number of cases is small, the trend is rather uneven, but it is good enough to give a rough idea. Both the males and females between 15 and 40 show the lowest mortality, 5‰ and 18‰. After these ages, mortality rises suddenly.

Next, we extended the mortality rate curve to include young children, and picked the point where it intersects with the mortality rate curve for one-year-old infants. We observe a rate of at least 130‰ for males and 150‰ for females. Would it not be possible to take these figures as the infant mortality rates which could not be obtained directly from the *shūmon-aratame-chō*? If we take this inference as correct, we may be able to adjust the low mortality rate of the entire population.⁽¹⁴⁾

Chart VII is a graphical presentation of the average life expectancy calculated at each age. It is longest at age 9 for both sexes, with 39.0 for males and 41.1 for females.

Finally, the birth and death statistics by month are presented. Because the solar-lunar calendar was used the question of intercalary months is comes up. To simplify the calculation, an intercalary month is combined with the preceding month.

(14) Using these critical observations, we shall now try to correct Tables III and IV. The total number of births for the period 1838–1870 was 389, that is, an average of 11.8 per year. By adding the number of deaths of one-year-old infants to this, we obtain the real number of births. Upon calculation, we find the number of deaths of one-year-olds to be 0.9, and thus the total number of annual births to be 12.7, in other words, a birth rate of 33.6‰. (31.2‰ before correction)

On the other hand, the death rate will be 25.9‰, (22.9‰ before correction) if similarly calculated on the basis of the average annual death number of 9.8 as corrected from 8.9. It must be remembered that these rates are merely estimated values.

TABLE VI. NUMBER OF BIRTHS AND DEATHS BY MONTH, 1837-1870⁽¹⁵⁾

	Births	Deaths		
		Male	Female	Total
January*	28	17	13	30
February*	14	10	4	14
March*	22	6	7	13
April***	54	15	26	41
May***	39	7	14	21
June	36	9	6	15
July*	22	30	13	43
August*	44	17	19	36
September*	22	7	9	16
October*	20	6	7	13
November	22	11	10	21
December	16	7	6	13
Total	339	142	134	276
Total of 4 Maximum months	173	74	72	150
Total of 4 Minimum months	72	26	23	53

* Asterisks show the number of intercalary months

Since there were 13 intercalary months during the 34 years from 1837 through 1870, and especially since they occurred 3 times each with April and May, it is necessary, strictly speaking, to deduct about 8% of the births and deaths in these months to evenly distribute births and deaths.

Even with this adjustment made for intercalary months, we still find that births and deaths vary largely according to the season. Births were more numerous in April, May, June and August, with more than half of the annual births occurring in these months, whereas they were fairly low in February, March, September, October, November and December. We find the variation in deaths, being involved with the sex factor, even more marked. More males died in July and more females in April than in any other month. It seems that this came from the climatic and occupational (agricultural) conditions.

VII. MARRIAGES AND BIRTHS

Table VII presents the ages at marriage by sex. The marriages made outside the village were not included. Since it was possible to know if the women who left the village after 1838 left because of marriage, a separate table has been provided to clarify their matrimonial and child-bearing statuses. Only the first marriages

(15) The number of cases is small compared with the births and deaths of Tables III and IV because only the cases for which the month of birth or death was definitely known were considered, that is, 339 out of 389 births, and 276 out of 294 deaths.

TABLE VII. AGE AT MARRIAGE

Age	Males				Females				Married outside the village
	Year at marriage								
	1778~ 1807	1808~ 1837	1838~ 1871	Total	1778~ 1807	1808~ 1837	1838~ 1871	Total	
14							1	1	
15									1
16					1		4	5	2
17					2	1	3	6	4
18		1		1	3	7	5	15	6
19					5	5	6	16	7
20		1	3	4	8	6	7	21	3
21	1	1	2	4	3	5	11	19	11
22		2	4	6	2	7	11	20	13
23	2	2	4	8	2	8	12	22	7
24	2	4	5	11	4	5	3	12	9
25	3	6	4	13	2	6	5	12	6
26	3	8	8	19	2	3	3	8	3
27	2	2	7	11	1	1		2	4
28	2	3	7	12		2		2	3
29		2	9	11			1	1	
30	2	7	4	13					2
31	7	6	4	17		3	1	4	
32	4	5	4	13					
33		3	1	4		1		2	1
34	3		1	4			1		
35	2	3		5					
36			2	2					
37	2	1		3					
38		1	2	3					
39		1	1	2					
40		1		1					
41			1	1					
42									
43									
44									
45			1	1					
Total	35	60	74	169	35	60	74	169	82
Average age at marriage	29.4	28.5	27.9	28.4	21.6	22.6	21.5	21.8	22.2

TABLE VIII. NUMBER OF BIRTHS BY AGE OF WIFE AT MARRIAGE (1808-1871)

Age at marriage	Number of births													Average	
	0	1	2	3	4	5	6	7	8	9	10	11	12		13
16						1									6.0
17															
18						2		2			1				7.4
19			1					1	1	1	1				7.5
20					2	1	1	1						1	7.8
21						1	2	2	1						6.5
22			1			1		4	1						6.1
23				2	1		2		1						5.0
24									1	1					8.5
25						1		1	1						6.7
26							2	1							6.3
27															
28					1		1								5.5
29															
30															
31		1			1				1						4.3
32															
33		1													1.0
Total	2	1	3	5	6	9	9	9	2	1	2		1		6.3
16-20 average															7.5
21-25 average															6.2
26 and above average															4.8

of both men and women have been considered. Thus, it is possible that the data from 1778 through 1807 include remarriages. The marriages were presumed to have taken place in the year previous to the *shūmon-aratame-chō* which officially recognized them, and hence at the ages of the couple on that occasion. No noticeable change is seen in the age at marriage; that of males was only slightly lowered. Generally speaking, the average age of marriage of men is higher than that of women, which is about 22. This fact is related to the lifelong fertility of women shown in Table VII.

Table VIII presents the number of children, regardless of whether living or dead, of the couples who were married after 1808 and who lived at least until age 45, classified by the wife's age at marriage.

The Table shows—though the sample is by no means large enough for certainty—a correlation between the age of marriage for women and the number of children born to them. The average age of marriage for women is 21. Women who married at this age gave birth to an average of 6.3 children during their fertile period of life. Adding the infants who died before reaching one year of age and thus do

not appear in the historical records, the actual number of births would be 7 or 8 on the average.

The marriages which took place both within and outside the village were analyzed. The local geographical range within which marriage took place, inclusive of adoptions, covers a radius of about 4 miles. Marriage partners came from almost all the villages falling in this radius. With the addition of such large towns as Nagoya, Kuwana and Miya (Atsuta), the scope of marriage extends over a surpri

TABLE IX. PROPORTIONS MARRIED BY AGE GROUPS (%)

Age \ Year	1778~1800	1801~1825	1826~1850	1851~1871
Male				
16-20	0	0.6	0	0
21-25	2.6	8.2	8.5	7.7
26-30	24.7	38.6	34.7	34.1
31-35	56.9	63.4	68.1	69.6
36-40	85.1	77.0	81.2	85.5
41-45	95.8	81.3	86.9	87.1
46-50	98.9	86.2	83.9	90.4
Total	45.3	42.0	46.3	43.5
21~50 Total	55.8	52.4	57.1	54.9
Female				
16-20	6.2	7.1	8.2	9.5
21-25	37.2	46.9	34.4	42.6
26-30	67.9	72.0	78.1	75.4
31-35	82.9	72.9	86.0	84.5
36-40	92.3	72.1	83.0	70.0
41-45	80.7	64.8	77.0	69.0
46-50	77.0	56.6	65.2	71.9
Total	56.0	52.8	53.0	54.6

TABLE X. NUMBER OF COUPLES IN A HOUSEHOLD (%)

Number of couples \ Year	1778~1800	1801~1825	1826~1850	1851~1871
0	12.0	20.4	19.8	13.8
1	67.3	66.1	59.8	64.0
2	19.0	10.4	10.2	20.9
3	1.5	1.0	0.6	1.1
4				0.2
Average number of couples	1.10	0.90	0.82	1.10

singly large area. In this respect the village was not at all as exclusive as one might imagine.

Table IX presents the marriage rates (%) by sex and age. Table X presents the number of married couples living in a family.

The numerical values in these tables are all expressed in percentages; they have been calculated from the arithmetic averages for each period of observation of roughly 25 years each. The percentages vary with the period, but generally they are similar to those for Yokouchi village of Shinano province in the latter half of the Tokugawa period. They seem to show conditions typical of the Tokugawa rural community which tended toward a nuclear family.

VIII. ANALYSIS BY FRF

Presented next is a demographic follow-up study of the behavior of married couples by the family reconstitution method. For every married couple entered in the *Shūmon-aratame-chō* of this village during the period from 1778 to 1871, we have made a set of cards in which to record the following particulars: the dates of births of each partner of the married couple, the number of marriages they have had, the date at which they were married, their ages at marriage, the date and the ages when they died, the date and the ages when their marriage came to an end, the reason for the end of their marriage, subsequent experience of remarriage (yes or no), the number of births of the wives by 5-year age gradation, the children by sex, the dates of their births, the ages of wives when they gave birth, birth intervals, deaths of children, etc. The number of cards thus formed, that is, the number of couples, was 237; their specifications are presented in Table XI.

We know that statistical data from a sample of this size is often influenced by accidental deviation. We went on, however, to divide the cards into two groups according to the period of time in which a wife was born; the first containing 108 wives who were born prior to 1800, and the second the 129 wives who were born in or after 1800. As was stated before, the reliability of this village's data is higher in the second period than in the first. This can be said of all the numerical values which will be presented hereafter.

Table XII presents the marital status of the 184 wives of childbearing age (16-50), the cases remained after excluding XA, C, ΔC from the total of 237 wives put in Table XI.

Table XII and XIV present the demographic behavior of husband or wife after he or she was divorced or was widowed.

Widowers younger than 40 usually married again, whereas the widows in that age group seemed to find it difficult to marry again.

Demographically considered, the behavior of a wife is more important than that of a husband. Our discussion will be centered mainly around them: First, we will take up the fertility of wives by age. Table XV presents the number of births and the fertility of the wives classified in 5 year age groups, with births before

TABLE XI. THE CLASSIFICATION OF FRF

Year of marriage	Kinds of FRF							Total
	A	XA	ⓐ	B	△B	C	△C	
1776-1800			12	17				29
1801-1825			26	32				58
1826-1850			21	34		7		62
1851-1871				14		39		53
Unknown	24	6			4		1	35
Total	24	6	59	97	4	46	1	237
Year of wife's birth								
1701-1725		1						1
1726-1750	14	5						19
1751-1775	10		11	13				34
1776-1800			23	30	1			54
1801-1825			25	36	3	4		68
1826-1850				18		39	1	58
1851-1875						3		3
Total	24	6	59	97	4	46	1	237

Kinds of FRF

- A: Had been married in 1778 when the religious investigation register was made for the first time.
- XA: Same as the above, but where wives were over 50 years old.
- ⓐ: The year of marriage was known, and the marriage lasted till wife was above 50 years of age-complete family.
- B: The year of marriage was known, but the marriage ended before wife reached her 50th year.
- △B: Same as the above, but where the year of marriage was unknown.
- C: The year of marriage known, but the last historical material (the religion investigation register of 1871) was made when wife was less than 50 years old.
- △C: Same as the above, but where the year of marriage was unknown.

TABLE XII. STATUS OF MARRIAGES

Period	First	Second	Total
Duration*	53	26	79
Death of Wife	10	20	30
Death of Husband	28	20	48
Divorced	0	7	7
Moved out	0	2	2
Unknown and Others	11	7	18
Total	102	82	184

* The marriage lasted at last until the wife became 50.

TABLE XIII. SUBSEQUENT MARITAL STATUS OF A HUSBAND AFTER BEING DIVORCED OR WIDOWED

Age of husband when divorced or widowed	First period				Second Period				Total			
	Not married	Re-married	Un-known	Total	Not remarried	Re-married	Un-known	Total	Not married	Re-married	Un-known	Total
21-25						2	2	4		2	2	4
26-30		4	1	5	1	2		3	1	6	1	8
31-35	1	2		3	1	5	2	8	2	7	2	11
36-40	1	2		3	1	2	1	4	2	4	1	7
41-45	2	1		3	2	2		4	4	3		7
46-50	1	1		2		1		1	1	2		3
over 51	4			4	3		2	5	7		2	9
Total	9	10	1	20	8	14	7	29	17	24	8	49

TABLE XIV. SUBSEQUENT MARITAL STATUS DURING THE CHILDBEARING YEARS OF A DIVORCED OR WIDOWED WOMAN

Age of wife when divorced or widowed	First Period			Second Period						Total					
	Not remarried	Died	Total	Not remarried	Remarried	Died	Returned to her parents' home	Unknown	Total	Not remarried	Remarried	Died	Returned to her parents' home	Unknown	Total
21-25		1	1			1			1			2			2
26-30	2		2		2				2	2	2				4
31-35	3		3	1			1	1	3	4			1	1	6
36-40	6	1	7	5				6	11	11	1			6	18
41-45	9	1	10	2				1	3	11	1			1	13
46-50	3	2	5	1				1	2	4	2			1	7
Total	23	5	28	9	2	1	1	9	22	32	2	6	1	9	50

marriage excluded.

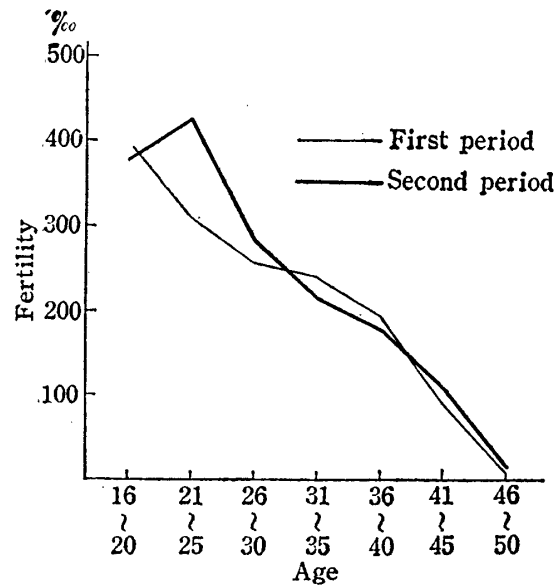
The number of years of marriage signifies the total number of conjugal years of the wives in each of the graduated age groups. The year in which marriage took place and the year in which it ended were each counted as 0.5; hence some odd sums were produced. Fertility is the ratio between the number of births and the number of a wife's conjugal years, that is, the average number of births per wife per year. The fact that fertility here follows a certain definite trend is shown graphically by Chart VIII.

The slope of the trend line differs for the first and second periods. As the second period is more reliable with regard to historical data, we will take up this period for consideration. The fertility here is highest in the age group 21-25, and it falls

TABLE XV. FERTILITY BY SPECIFIC AGE GROUP

Age groups of wives	First period			Second period			Total		
	Number of years of marriage	Number of births	Fertility (%)	Number of years of marriage	Number of births	Fertility (%)	Number of years of marriage	Number of births	Fertility (%)
16-20	45.0	18	400	69.0	26	377	114.0	44	386
21-25	225.0	70	310	334.0	142	425	559.5	212	379
26-30	328.5	84	256	459.0	129	281	787.5	213	270
31-35	352.5	85	241	396.0	85	215	748.5	170	227
36-40	338.5	66	195	295.0	53	180	633.5	119	188
41-45	306.0	28	92	200.0	22	110	506.0	50	99
46-50	273.5	2	7	150.5	2	013	424.0	4	9
Total	1869.5	353	189	1903.5	459	241	3773.0	812	215

Chart VIII. Fertility by Specific Age Group

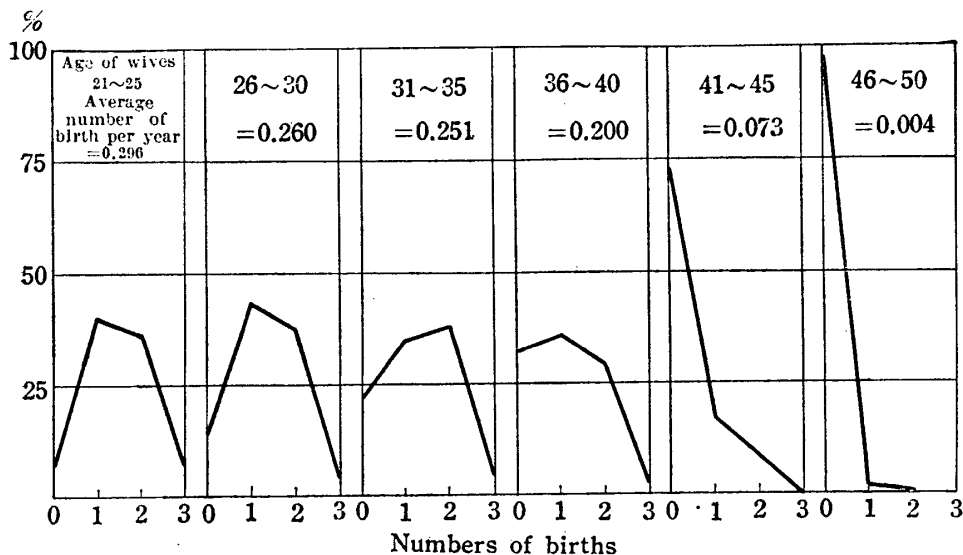


rapidly after this. The group under age 20 shows a low fertility; this is a generally admitted occurrence in Western Europe also. In examining the first period, however, we notice a rather high rate for this age group in Kando-*shinden*. This is probably because of the defective reporting of marriages. In other words, the wives' real conjugal years must have been longer than is shown in the table, thus resulting in a depiction of the fertility rate as higher than it actually was.

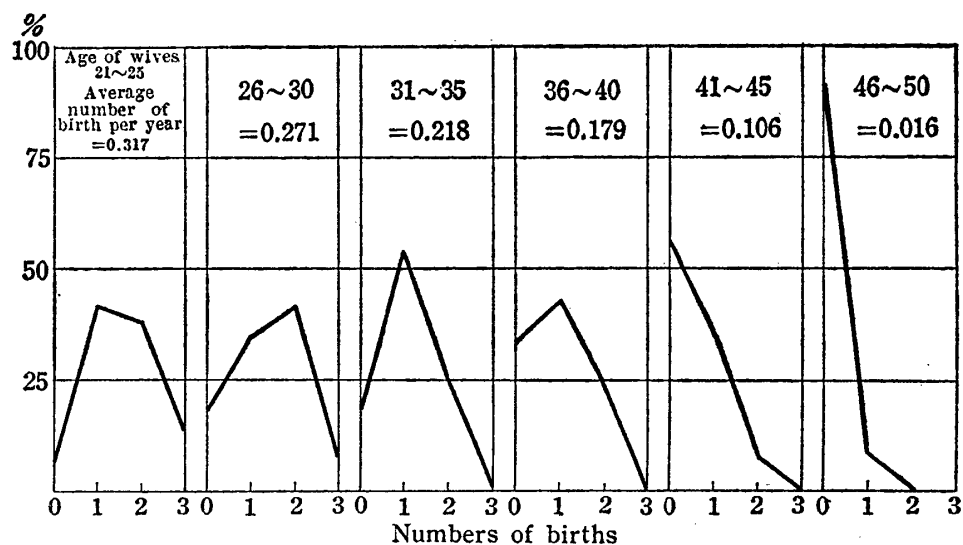
Table XVI presents birth distribution by 5-year age gradations; only the couples who have lived together for a full five years in each age period have been considered. Chart IX is a graphical presentation of Table XVI, showing the composition rates of the birth distribution for each of the different age groups. As with the previous cases, the reliability of the table and the chart is higher for the first than

Chart IX. Number of Births Per Wife by Specific Age Group

(1)—First Period



(2)—Second Period

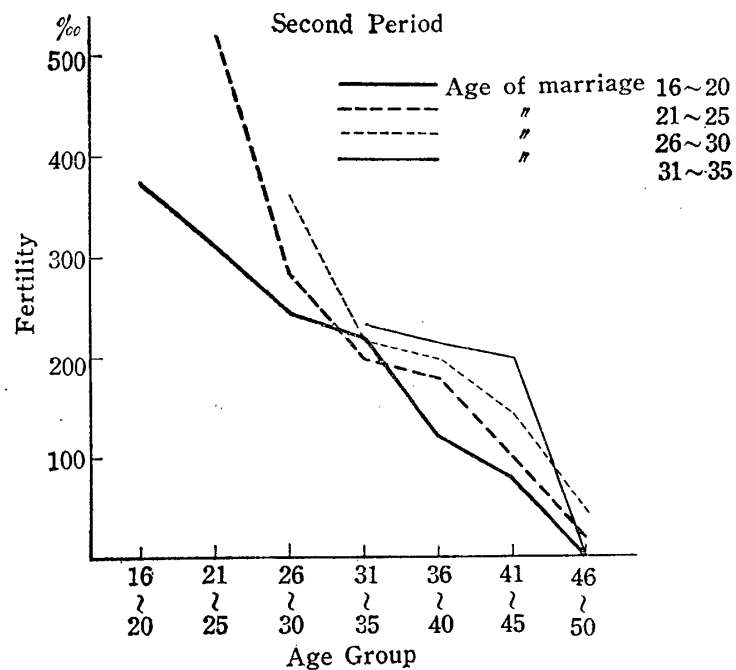
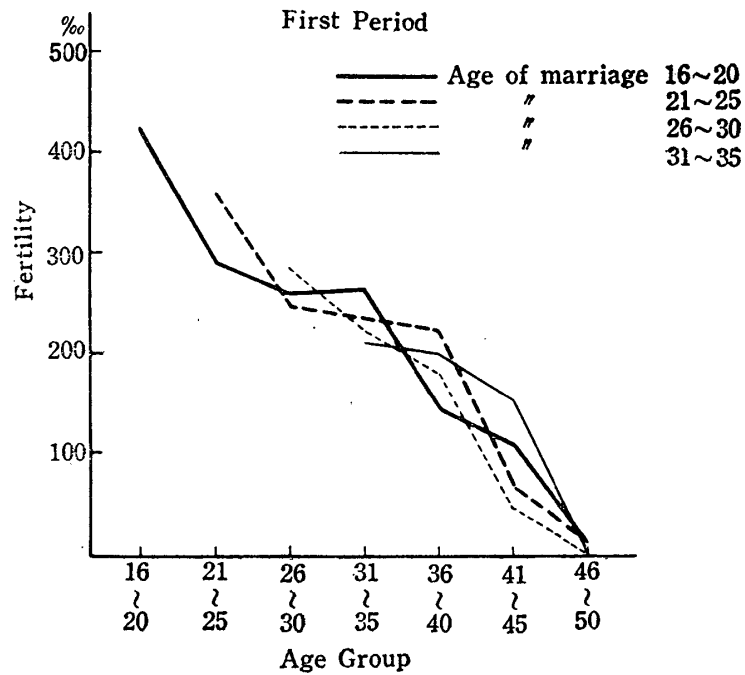


with the second of the time periods.

Next, we will look into how age at marriage influences fertility. Chart X presents fertility by 5-year gradations of age at marriage. Probably because of the technical weaknesses in the utilization of the historical material for the first period, fertility becomes higher with a rise in the age at marriage; in other words, the number of births does not decrease in proportion to the increase of age at marriage.

Finally, the relationship between the length of marriage and the number of births is examined. As was seen with the Table 15, the number of births drops rapidly after age 40. Here we examined births to wives between 16 and 40 with regard to the length of their married life. As is seen in Table XVII, the correlation between

Chart X. Fertility in Specific Age Groups by Wife's Age at Marriage



these two factors is clearly discernible; with every 5-year increase in the length of married life, the number of births increased by 1.2-1.4.

In Table XVIII, we turn to the question of the interval between births. Taking up Column B of Table XI (complete family), we examine the cases where marriage lasted till the end of the wife's childbearing years. Since 3 women out of the 34 presented in the first period had no children, the actual number of cases considered.

TABLE XVI. BIRTH DISTRIBUTION BY SPECIFIC AGE GROUP OF WIVES

Age group of wives	Number of birth in 5 each year period					First period					Second period					Total				
	0	1	2	3	Total	0	1	2	3	Total	0	1	2	3	Total					
16-20						0	0	1	0	1	0	0	1	0	1					
21-25	3	10	9	3	25	2	12	11	4	29	5	22	20	7	54					
26-30	8	23	20	2	53	14	26	31	5	76	22	49	51	7	129					
31-35	14	22	24	3	63	13	36	17	1	67	27	58	41	4	130					
36-40	20	22	18	1	61	16	20	11	0	47	36	42	29	1	108					
41-45	38	9	5	0	52	20	13	3	0	36	58	22	8	0	88					
46-50	48	1	0	0	49	23	2	0	0	25	71	3	0	0	72					
Total	131	87	76	9	303	88	109	74	10	281	219	190	150	19	584					

TABLE XVII. NUMBER OF BIRTHS AND DURATION OF MARRIAGE

Duration of marriage*	First period			Second period		
	Number of couples	Number of births	Average number of births per couple	Number of couples	Number of births	Average number of births per couple
0- 5	18	8	0.44	32	33	1.03
5.5-10	11	21	1.91	20	49	2.45
10.5-15	17	53	3.12	23	84	3.65
15.5-20	30	137	4.57	41	193	4.71
20.5-25	18	105	5.83	13	77	5.92
Total	94	324	3.45	129	436	3.38

* Wives between 16~40 years

here is 31. The interval between two births was considered 0 if they occurred in the same year. The interval between marriage and first child was treated in the same way. That we find many 0's in this period was due to the defective reporting of marriages.

The table seems to show no particular relationship between birth interval and the order of birth, with the exception of the first child. The interval is generally about 3 years, contrary to the common expectation that the interval widens with each succeeding child. It seems correct, therefore, to say that the childbirth interval is fairly uniform regardless of the number of children. The decline in the birth rate with the increase in the mother's age occurs because a correspondingly large number of mothers restricted the number of children born.

Table XIX presents the ages of mothers at their last childbirth. Since the number of cases is small, we cannot say anything definite, but with each increase in the number of childbirths, the mother's age at her last childbirth rises. On the average,

A First period

TABLE XVIII. BIRTH INTERVALS

Order Inter- val	Mar- riage -1st Child	1st -2nd	2nd -3rd	3rd -4th	4th -5th	5th -6th	6th -7th	7th -8th	8th -9th	9th -10th	10th -11th	Total
0 (year)	12											12
1	4	1	2	4	2	1		1				15
2	10	8	7	6	8	2	4	4	2			51
3	4	8	14	8	6	9	2	2	2	1		56
4	1	7	5	6	2	3	2	1				27
5		4		1	1							6
6		1				1	1					3
7					1		1					2
8										1		1
9												
10					1							1
11				1								1
Total	31	29	28	26	21	16	10	8	4	2		175
Average Interval (year)	1.2	3.3	3.0	3.1	3.1	3.3	3.5	2.4	2.5	5.5		2.8

B Second period

0 (year)	6											6
1	14	2	2	1		1		1				21
2	2	9	9	8	6	4	4	2	2	1		47
3	1	5	7	7	3	4	5	1		1	1	35
4	1	6	4	2	4	2	1					20
5	1	2	1		3	1	1					9
6						1		2				3
7				1		1		1				3
Total	25	24	23	19	16	14	11	7	2	2	1	144
Average Interval (year)	1.2	2.9	2.7	2.4	2.9	3.4	2.9	3.9	2.0	2.5	2.0	2.7

each succeeding childbirth results in about a 1.5 year extension of the childbearing period.

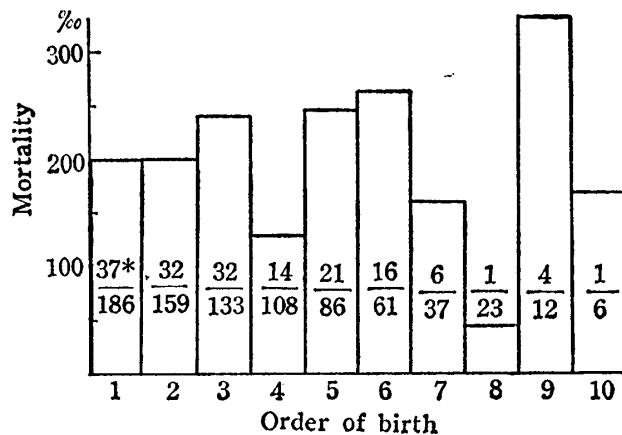
(C) Child mortality.

As was mentioned above, more than 20% of all the registered children died before reaching 5 years of age. Here we examine the relationship between the order of birth or the wife's age at the time of childbirth and child mortality. Table XX presents the mortality of children under 5 years of age by the order of their births. Chart XI shows graphically the average mortality of children by the order of their births. This is also presented in the bottom column of Table XX.

TABLE XIX. AGES OF WIVES AT THEIR LAST CHILDBIRTH

Age of wife	Order of last childbirth													Total
	1	2	3	4	5	6	7	8	9	10	11	13		
27		1												1
29				1										1
30		1												1
31		1		1										2
33				1		1								2
34				1										1
35			1		1	1								3
36	1													1
37	1		1	1	3			1						7
38								1		1	1			4
39					1	4	2							7
40					1	1		2						4
41					1	2		1					1	5
42						1	2							3
43			1						3					4
44			1						1					2
45					1				2	1				4
46										1				1
47								1						1
48								1			1			2
Total	2	3	4	5	8	10	7	10	3	2	1	1	1	56
Average age	36.5	29.3	39.8	32.8	38.9	38.8	40.7	43.1	43.0	43.0	38.0	41.0	39.2	

Chart XI. Child Mortality by Order of Birth



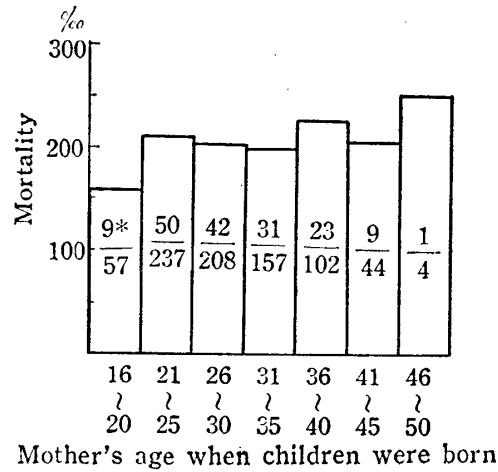
* The fractions represent:

$$\frac{\text{Number of children who died before reaching 5 years of age}}{\text{Number of births}}$$

TABLE XX. CHILD MORTALITY BY THE ORDER OF BIRTH

A First period Number of births	Order of birth of children who died	Number of couples													Total	Mortality (%)	Number of couples with no child deaths	Ratio (%)		
		1	2	3	4	5	6	7	8	9	10	11	12	13						
1	10	2															2	200.0	8	80.0
2	8	1	1														2	125.0	6	75.0
3	8	1	2	3													6	250.0	3	37.5
4	6		1	1	1												3	125.0	3	50.0
5	11	2	1		2												6	109.1	8	72.7
6	10	3	1		1	1	2										8	133.0	5	50.0
7	3	1		1	1	1	2										7	333.0	0	0
8	8	3	3	1	1	2	2										11	171.9	1	12.5
9	4		1	1	1	1			1		2						6	166.7	1	25.0
10	2		2	1	1	1	1	1	1		1	1					9	450.0	0	0
Total	70	13	12	8	7	7	7	7	1	1	3	1					60		35	50.0
Mortality (%)		185.7	200.0	153.8	151.0	184.2	259.3	58.8	71.4	500.0	500.0							181.8		
B Second period																				
1	17	5															5	294.1	12	70.6
2	18	4	2														6	166.7	13	72.2
3	17	5	4	4													13	254.9	9	52.9
4	16	4	3	4	3												14	218.8	6	37.5
5	14	3	2	6		5											16	228.8	6	42.9
6	14		5	4	1	5	5										20	238.1	2	14.3
7	11	2	2	4	2	2	2	2									16	207.8	4	36.4
8	6	1		1	1	2	2	1									7	145.8	2	33.3
9	1		1	1				1									3	333.3	0	0
10																				
11	1		1								1						2	181.8	0	0
12																				
13	1			1					1				1				3	230.8	0	0
Total	116	24	20	24	7	14	9	5	0	1	0	0	1	0	0		105		54	46.6
Mortality (%)		206.9	202.0	296.3	109.4	291.7	264.7	250.0	0	333.3	0	500.0	0	0	0			218.8		
Total	186	37	32	32	14	21	16	6	1	4	1	1	0	0			165			
Mortality (%)		198.9	201.3	240.6	129.6	244.2	262.3	162.2	43.4	333.3	166.7	500.0	0	0				203.7		

Chart XII. Child Mortality According to the Age of Mothers at Birth



* The fractions represent:

$$\frac{\text{Number of children who died before reaching 5 years of age}}{\text{Number of births}}$$

TABLE XXI. CHILD MORTALITY ACCORDING TO THE AGE OF MOTHERS AT BIRTH

Age of mother at childrens birth	First period			Second period			Total
	Number of births	Number of child deaths	Mortality %	Number of births	Number of child deaths	Mortality %	Mortality %
below 15				1	0		
16-20	22	3	136.4	35	6	171.4	157.9
21-25	85	20	235.3	152	30	197.4	211.0
26-30	78	9	115.4	130	33	253.8	201.9
31-35	72	13	180.6	85	18	211.8	197.5
36-40	50	11	220.0	52	12	230.8	225.5
41-45	21	4	190.5	23	5	217.4	205.5
46-50	2	0		2	1	500.0	250.0
Total	330	60	181.8	480	105	218.8	203.7

According to the chart, it would seem that child mortality varies according to the order of birth. Except for cases in which 7 or more children were born to one mother, cases too few in number to be statistically relevant, we find that child mortality increases slightly with each succeeding child. For example, the mortality of the first or the second child is about 200%, while that of the 5th or the 6th children is 250%. Here again, however, we should refrain from making any conclusive statement as the number of the cases considered was very small. We simply indicate the fact that there is a possible trend.

Finally, we looked into influence of the age of mother on child mortality. Table

XXI shows the children's mortality by 5-year gradation of mothers' age, and Chart XII is a graphical presentation of this, with the first and the second periods considered together.

Child mortality seems to rise slightly with an increase in the wife's age at each birth. Nothing definite, however, can be said as the number of cases is too small. However, the clearly evident low mortality of the children of mothers under 20 years old seems suggestive of a possible influence of the wife's age on child mortality.

IX. A CONCLUSION

Kando-shinden grew to be about 2.5 times larger in population and 2.3 times larger in terms of the number of houses during the period examined. The increase rate of the population was greater in the first period. An average for the entire period shows an annual increase rate of 0.9%. It is clear that this increase was due to a natural increase, that is, an increase of births over deaths.

Chart XIII shows graphically the movements of the birth rate, the death rate, the marriage rate which is an influential factor in the birth rate, and the variation in the rate of marriage of the women in the child-bearing ages, that is, 16-50. The figures presented are indices of a 5-year moving average. In obtaining the indices, the means of the values throughout this period were used in calculation. In other words, a birth rate of 32.56‰, a death rate of 22.16‰, a marriage rate of 7.39% (number of marriages divided by the total population), a proportion of married women, 55.02% (the number of married women divided by the total number of women in the same age) and the average number of persons per house 6,048 were taken as 100 respectively.

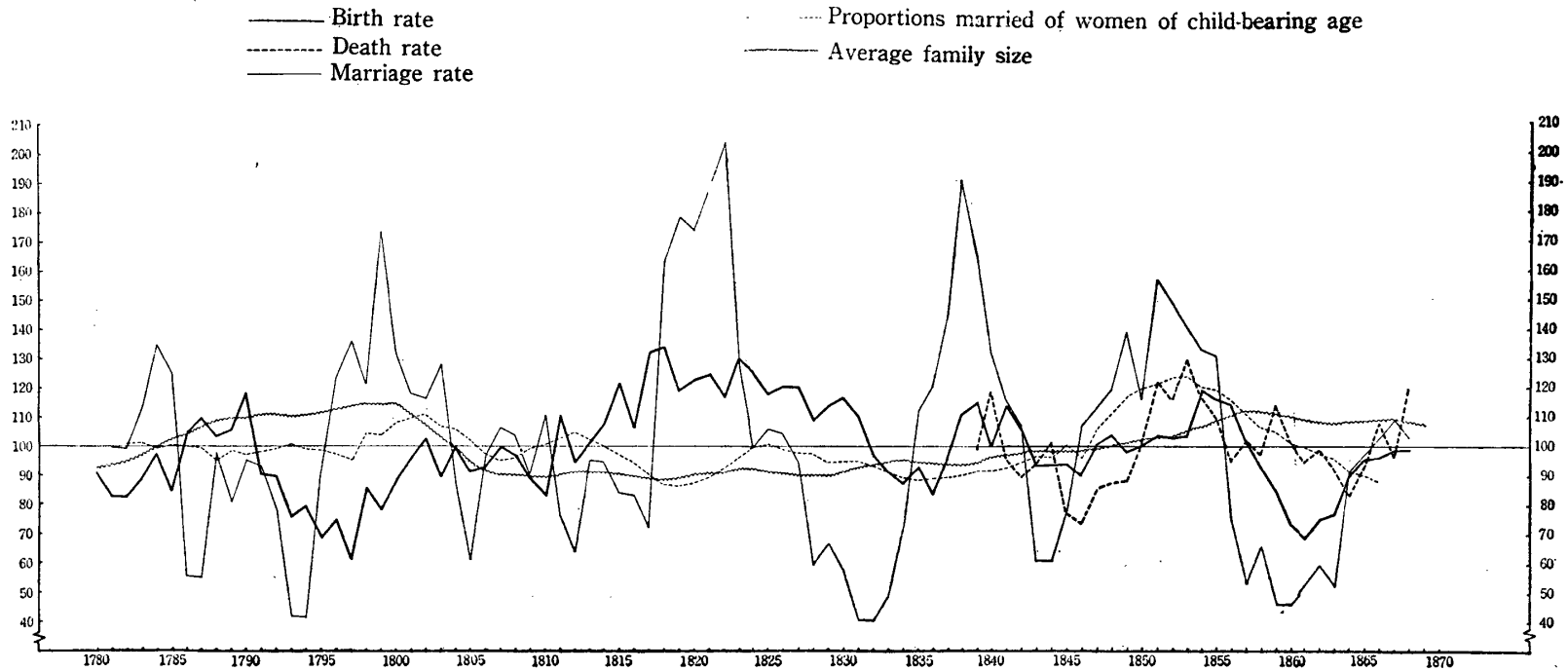
In this graph we notice the following characteristics: each value repeats itself in a circular wave. However, because of the limited time period, it is impossible to isolate general trend patterns from short run fluctuations.

We can recognize a mutual relationship between these waves with regard to the birth rate and the marriage rate, although we will have to admit some time lag here. The most clearly discernible relationship is the one between the average number of persons per house and the birth rate; the fewer the number of household members, the greater the birth rate.

A small household meant a shrinkage of family size which meant a family branching. This enabled the maintenance of high birth rate for some time, and with the passage of time, brought about an increase in the average number of persons per household. Here a check to population increase begins to work. It is dubious, however, if we can call this a definitely operative demographical wave. The marriage rate shows a peak every 15 to 25 years, bringing about a rhythmical movement of the birth rate every 30 years.

Finally, we must consider whether this particular village can be taken as typical of all of Japan. Needless to say, it is unlikely that a mere country village is re-

Chart XIII. Fluctuations in the Birth Rates, Deathrates, Marriage Rates, Average Family Size and the Proportions Married of Women in the Child-bearing Ages. (Indices)



representative of the whole of Tokugawa Japan. The time period which this essay dealt with is generally considered a period of demographic stability in Japan. It seems correct to say that this is true for the country as a whole. This village had a peculiar advantage in being able to exploit new land rather easily and there was felt to be little necessity for a check on population. In other words, the village had specific conditions typical of areas which tended to gain in population.

It is vital for students of demography to gather with patience as many source materials as possible so that they can establish some precise demographic indices. In doing so they will make a contribution to the knowledge of social conditions during the Tokugawa period the study of which has depended too much on literary source material, instead of positive statistical evidence. Should the author and his group succeed in their study, it will be possible to make international comparisons and execute this study on a still higher level. This study, it is hoped, will serve as a cornerstone for the achievement of this objective.